

Natural Explanations of Supernatural Thought

To an evolutionary psychologist, the universal extravagance of religious rituals, with their costs in time, resources, pain and privation should suggest as vividly as a mandrill's bottom that religion may be adaptive.

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1 Introduction

Where did we come from? And how did we come to be the way we are? Ever since mankind has had the cognitive ability to ask these questions, they have been asked; and consequently answers have followed. Particular answers to these questions are as varied as humanity itself, but can generally be cast into two broad categories: First, many explanations are faith-based, and appeal to supernatural agents that created the world and everything in it. By definition, these faith based approaches advocate belief without proof or even evidence of the “truths” they posit. Thus, faith-based explanations are not falsifiable and are generally constructed in such a way as to account for all possible eventualities and evidence. For example, the book of Genesis posits: “So God created man in his own image, in the image of God created he him; male and female created he them”.¹ Notice how this statement is sufficiently vague so as to evade the possibility of any sort of empirical investigation. How could one ever test the truth of this proposition via experiment? In vivid contrast, other explanations of human nature and its origin are reason-based and use logic and evidence to produce a coherent and falsifiable theory concerning the origins of the world and all biological processes therein. Currently, Darwinian natural selection is the champion theory of this reason based approach. When considering all available evidence, Darwinian evolution via natural selection is best able to account for the evidence, while producing the fewest inconsistencies, both internally and with other areas of science. The striking difference between faith-based (religious) and reason-based (scientific) enquiry is that if some new piece of evidence arises that contradicts a scientific theory, the theory itself would be sufficiently changed to account for this new evidence, or thrown out completely in favour of some new theory that

¹ The Bible, Genesis 1

adequately accounts for it. Evolutionary psychologist Steven Pinker sums up this scientific reasoning nicely:

Natural selection is a falsifiable hypothesis about the origin of design and imposes onerous empirical requirements. Remember how it works: from competition among replicators. Anything that showed signs of design that did not come from a long line of replicators could not be explained by – in fact, would refute – the theory of natural selection: natural species that lacked reproductive organs, insects growing like crystals out of rocks, television sets on the moon, eyes spewing out of vents on the ocean floor, caves shaped like hotel rooms down to the details of hangers and ice buckets.²

The difference between these two methods of enquiry can be summed up as follows:

Scientific explanations search for provisional truth (i.e. truth with a lowercase ‘t’, that is true given the evidence that’s been discovered thus far), while religious explanations claim to have found ultimate Truth (i.e. Truth with a capital ‘T’ that will never change regardless of what evidence turns up). The distinction between religious and scientific enquiry is important in that our investigation of religious thought here will be carried out from a scientific perspective. That is, no weight will be given to the hypothesis that religion exists because it is true, or because some god has actually laid down a certain set of divine rules to follow and rituals to perform. Anthropologist Pascal Boyer sums up best:

When I say that we now have a better account of religion, I of course mean a better one compared to previous scientific accounts. In this kind of theory we describe phenomena that can be observed and measured. We explain them in terms of other phenomena that are also detectable...People who think that we have religion because religion is true (or their version of it is, or perhaps another, still to be discovered version is) will find little here to support their views, and in fact no discussion of these views.³

² Pinker, 2005 pg. 174

³ Boyer, 2001 pg. 48

Rather, the views that will be discussed in this paper will focus on conciliatory naturalistic explanations of supernatural (religious) thought, i.e. Darwinian explanations: “...what pressure or pressures exerted by natural selection originally favoured the impulse to religion?”⁴ In this way, the investigation of naturalistic causes or origins of religion presupposes the nonexistence of God as defined (differentially) by all world religions. However, this hypothesis is secondary to the focus of our investigation, and will largely be left out of the discussion. Indeed, even if *some* supernatural agent did create the universe and all things in it, evolutionary psychologists would still want to know *how* this process occurred, and use Darwinian natural selection, rather than supernatural caprice, as their explanatory tool. As Richard Dawkins aptly points out:

The abundance and variety of life on earth may seem improbable, but it is self evidently futile to invent an improbable god to explain that very improbability.⁵

Once one grasps the Darwinian framework of naturalistic explanations, many hypotheses become plausible: religious thought evolved because it provides comfort, or because it fosters in-group cooperation, or even because it satisfies our need to understand why we exist. The particular puzzle with evolutionary explanations of religion is the apparent “waste” of time and resources that religious activities seem to entail for the individual. Darwinian logic informs us that any waste whatsoever will be selected against:

If a wild animal habitually performs some useless activity, natural selection will favour rival individuals who devote the time and energy, instead, to surviving and reproducing. Nature cannot afford frivolous *jeux d'esprit*. Ruthless utilitarianism trumps, even if it doesn't always seem that way.⁶

⁴ Dawkins, 2006b pg. 163

⁵ Dawkins, 2006

⁶ Dawkins, 2006b pg. 163

So, how could religious thinking ever come about by such a process? Dawkins goes on to note that uncertainty concerning the details of such naturalistic explanations need not stop the entire explanatory endeavor, because we know that the religious behaviour must be “for” something. That is, because we know that natural selection eliminates (or imposes significant pressures against) the waste of time and energy, and, that humans all over the world devote time and energy to religion, it follows that religious thought provides (or provided) some form of benefit to the individual, or exists as a byproduct of something that does.

Once this point is established, the challenging (and exciting) part comes in tracing the route from religious thought to the actual genetic benefits, or conversely from the lack of religious thought to the genetic detriments. Many theories have been proposed, ranging from the predisposition for religious thought being adaptive to the individuals themselves, to religious thought being a byproduct of some other set of direct fitness enhancing characteristics. Dawkins notes that focusing on behaviours as a byproduct of something else can often be not only helpful, but essential to understanding it. Dawkins gives us the example of the propensity for moths to fly directly into a candle flame. What could possibly be the genetic benefit of such behaviour? It is only when we realize that moths and other insects have evolved the ability use light as a sort of external compass that we can start to make sense of the behaviour pattern. Since the moon and the stars are at optical infinity, the incoming rays of light are parallel and therefore amenable for use as navigational aids via a simple rule e.g. keep the light at 30 degrees. However, when in the presence of a candle (which casts light in all directions) insects are drawn increasingly close to the source via repeated application of this rule, and thus perish in the

flame. Thus some behaviours must be understood as byproducts of other evolved mechanisms if they are to be understood at all. Could religion be one such behaviour?

The following is just a few of the many hypotheses put forward in recent years for a naturalistic explanation of religion as a byproduct:

- Religion as a byproduct of childhood gullibility, which presumably has genetic advantages via children learning important fitness enhancing things about the world from their caregivers.⁷
- Religion as a byproduct of the tendency towards a dualistic theory of mind, which presumably has genetic advantages via providing a mental heuristic through which to understand the physical world and the agents therein.⁸
- Religion as a byproduct of an irrationality mechanism in the brain, which presumably has genetic advantages via fostering irrational emotional states such as romantic love.⁹
- Religion as a byproduct of the integrated functioning (or malfunctioning) of many evolved “inference systems” which are designed to maximize fitness quite separately from any religious thoughts they may help to construct.¹⁰

This last hypothesis is explicated in Pascal Boyer’s *Religion Explained*, and perhaps requires the most clarification; as such, it will be the focus of the remainder of this paper. Although I am limiting myself to one particular theory here, it is of greater importance to understand the range of theories of this type, and the supporting Darwinian logic that makes them plausible and indeed promising ideas. Boyer’s theory of the origins of religion is one of many, but one that accounts for much of the presently available evidence. And, like all good scientific hypotheses, it is subject to revision and abolition should any future evidence point to contrary conclusions. In explicating Boyer’s theory I will include the following sections: In section 2, I will outline Boyer’s argument for what constitutes a supernatural concept, before then explaining why these concepts are so pervasive in human thought in section 3. In section 4, I will provide one possible

⁷ Dawkins, 2006b

⁸ Paul Bloom, as discussed in Dawkins, 2006b

⁹ Dennett, 2006

¹⁰ Boyer, 2001

explanation (Boyer's) as to how the mind's affinity for these religious concepts gives rise to religious thought and action. A summary of the overall explanatory endeavor will be given along with some concluding remarks in section 5.

2 The Nature of Supernatural Concepts

Before we can understand how supernatural concepts are amicable to the human mind, and therefore how religious concepts are “constructed” by the mind, we must first define the notion of a supernatural concept. What, if anything is common to all supernatural concepts? Upon initial reflection, it seems that all supernatural concepts share a certain form of strangeness in the empirical sense. That is, all supernatural concepts seem to make some unsupportable or *unnatural* claim about the state of the natural world. However, Boyer notes that strangeness alone is not a sufficient condition. Certain ideas that are strange to us would never pass for serious religious beliefs. For example: “There is only one God! He is omnipotent. But he only exists on Wednesdays.”¹¹ So what then are the sufficient conditions for a religious or supernatural concept?

Boyer begins constructing an answer to this question by focusing on the process by which the human mind creates and stores regular concepts: via adding information to highly specialized mental templates. When we come across a new concept, we map the new information about this object or agent onto preexisting templates corresponding to natural objects, plants, animals, tools, or persons. Most objects in our environment can be understood as a variation of one of these five templates, alternatively called an ontological category. To use Boyer's example, if we are told that Zygoons feed on

¹¹ Boyer, 2001 pg. 56

hyenas, we intuitively infer many things about Zygoons simply by virtue of sharing the mental animal template with the informant. Thus, the information inherent to the template itself need not be made explicit. Empirical studies have demonstrated that assumptions such as symmetry along the spinal cord, and forward looking eyes are inherent to the animal ontological category. Also, we would expect that if we cut open one hundred Zygoons, each of their bodies would contain the same compliment of organs and tissues.

So, if this is what constitutes a normal concept, how are religious concepts different? Boyer defines religious concepts as having two properties: an ontological category, and a violation of some aspect of that category that differentiates it from other “normal” members of the category. This formulation can be expressed using the following equation:

- Supernatural concept = [ONTOLOGICAL CATEGORY] + category violation

For example, the Uduk-speaking peoples of Sudan believe that certain ebony trees are able to hear conversations that are had within their shade. This supernatural concept is composed of the plant ontological category, and the violation of being able to hear conversations. Written using the above nomenclature:

- Special listening tree = [PLANT] + ability to hear conversations

The following is a fairly comprehensive list of common supernatural beliefs:

- Ghosts/Gods = [PERSON] + counterintuitive physiology
- Gods that don't grow or die = [PERSON] + counterintuitive biology
- Gods with unblocked perception = [PERSON/ANIMAL] + counterintuitive psychology
- statues that bleed = [TOOLS] + counterintuitive biological properties
- artifacts with the ability to hear what is spoken = [TOOLS] + counterintuitive psychological properties

Thus, although it seems as though there are an infinite number of possibilities for supernatural concepts, there is actually a fairly limited catalogue of such concepts that are used as salient religious ideas. The important point here is that just as with the case of the Zygoon, a massive amount of information can be inferred about a supernatural object or agent by mentioning only a very small amount of information. For example, because ghosts are violative variants of the person ontological category, we need not be informed that these ghosts have minds, i.e. that they think before speaking, are aware of our minds and have memories of past events and actions they have witnessed. Again, this information is implied in the ontological category template upon which this concept is built. In fact, empirical results from Justin Barrett's work in experimental theology suggest that people across cultures and continents have higher recall for concepts that include a violation as compared to those that do not. For example, it was found that people have higher recall for a table that gets sad when someone leaves the room as compared to a regular table or even an odd table, such as one made of chocolate.¹² Given this definition of supernatural concepts, and their bias in human memory, the important question becomes: why are they so salient (and ubiquitous) in human thinking?

3 A Mind Primed for Religion?

What is it about our evolved minds that produce an affinity for supernatural agents and objects? If such things do not truly exist, why would natural selection ever have selected minds that favoured this illusory thinking? The answer, as it turns out, is that these illusory thoughts are complex byproducts of the differential functioning of mental "inference systems" that provide independent fitness advantages via processing

¹² Barrett, 1996 as discussed in Boyer, 2001

specific types of incoming information. The sum of all these inference systems afford us the experience of consciousness, and leads us to believe that our brains are performing relatively simple tasks. However, there is an astonishing amount of work that the brain must carry out in order for us to have this experience. Boyer explains this situation with an analogy: Our state of consciousness can be likened to the view that guests have while staying at a large household (he uses Pemberley from Jane Austen's *Pride and Prejudice*). Although the guests simply experience seamless service, there is actually an *inaccessible* complex order and division of labor that occurs in the basement. Such are our inference systems: without our conscious knowledge they process very different types of information to produce very specific products to offer up to our consciousness. Boyer sums up:

The most banal scenes of everyday life are replete with facts that seem obvious or simple only because we have a veritable Pemberley in the head, a huge mental basement filled with extremely efficient servants who's activities are not available to detailed conscious inspection.¹³

Just a few examples of inference systems given by Boyer include mechanisms that foster an understanding of:

- the physics of solid objects
- physical causation
- goal directedness
- different people (i.e. with great speed and accuracy)

The point here is that our mind is composed of a myriad of these consciously inaccessible inference systems that were shaped by natural selection to solve recurrent problems inherent in the ancestral environment. Knowing something about the physical world, the goals of others, and being able to tell one person from another (among other things) are

¹³ Boyer, 2001 pg. 98

huge benefits that clearly have some reproductive and/or survival value. As an additional consideration, Boyer notes that the output from our inference systems can be “decoupled” from our actual experiences, yielding the ability to “produce coherent and useful inferences on the basis of imagined premises”¹⁴. For example, we have no problem inferring how we *would* feel and react if we were to encounter a bear in the woods, or a thief in our home. Such is true for or any other *imaginable* situation. It is this ability to produce specialized inferences in a decoupled mode that allows the human mind to appreciate and participate in a large variety of behaviours that have no direct fitness-enhancing value. The production of and appreciation for music is exemplary of such behaviours. The comprehension of human speech requires the sophisticated collaboration of several inference systems that just so happen to allow for an affinity for music:

To exaggerate a little, what you get from musical sounds are super vowels and pure consonants. These properties make music an intensified form of the sound-experience from which the cortex receives purified and therefore intense doses of what usually activates it.¹⁵

Boyer proposes that insofar as the phenomenon of music is explicable as the byproduct of the “inappropriate” firing of networks of related inference systems, so too is supernatural thought, and religion.

4 Agency Detection and the Construction of Gods

Given that our minds are composed of many inference systems, how does it produce the experience of supernatural concepts? What is it about our specific inference systems that lead us to believe in gods, ghosts and other supernatural entities? Boyer makes the argument here that when presented with ambiguous cues, the human mind

¹⁴ Boyer, 2001 pg 131

¹⁵ Boyer, 2001 pg 132

immediately seeks to anthropomorphize and detect “agency” (i.e. another mind, or being). Our cognitive processes intuitively and unconsciously seek to fit the most complex explanation we know of (i.e. other human minds) to each situation, so as to maximize the number of relevant inferences that are made about the situation. For example, we gain more salient inferences from a paper, a book, or a work of art when we attribute its design and composition to another human mind rather than as a randomly occurring natural artifact. This allows us to attribute goals and desires to the creator, and extract more information from it. This unconscious anthropomorphizing of our environment is also why we see faces in puffy clouds, and human figures in ill-lit, unfamiliar places. It is no coincidence that this tendency for agency detection has real evolutionary benefits. The ability to attribute strange rustling noises in the bushes, or the distinct sound of footsteps to an agent must be a useful tool indeed. In fact, not only does natural selection provide human minds with the ability to detect agency, it actually predisposes the mind to overactive agency detection, because in detecting agency, a false positive detection (i.e. attributing the snapping of a branch to an agent) is better than a failed detection (e.g. attributing a predator’s footsteps to random environmental noises) which could possibly end in death. Overactive agency detection is important to our investigation of supernatural concepts because it suggests that people need not actively create the gods they envision, but rather are subject to processes that passively detect certain “traces” of them in their environment. So perhaps gods and spirits are literally conjured from unconscious processes of agency detection, but quite unlike a fleeting overreaction to a strange noise, the ideas gods and spirits are stable over time and even sometimes culture. How can we explain this?

Boyer accounts for this difference by noting that generally gods and spirits are thought of in terms of exchange partners. Recall the definition of a supernatural concept from section 2: an instance of an ontological category, plus some violation of that category. In this nomenclature, gods and ghosts are simply people (with human minds), with counterintuitive physiology, biology or psychology. Since our minds are well suited to making inferences on the basis of imagined premises (i.e. decoupled thought) we arrive at many of inferences about these gods and ghosts. Thus, once a god or ghost is detected by our overactive agency detection systems, it is a short logical step from there to attribute practical and salient qualities to the stable 'person' template, and make inferences accordingly. Boyer notes that over time, the supernatural concepts that bear the most practical relevance to daily life enjoy the most success in cultural transmission. This selection process works much like natural selection in that over time, slight magnifications or deletions of traits are summed to produce something very different from the original. Through this differential selection of supernatural traits, we end up with gods and spirits that violate their ontological categories in ways that are relevant to us and our daily lives. Boyer demonstrates this by contrasting examples of superfluous and salient characteristics of gods:

- (1) God knows the contents of every refrigerator in the world
- (2) God knows that you are lying¹⁶

Although it may be the case that a particular god knows the content of every refrigerator, we generally find this quality to be trivial. The second statement is much more relevant here, and thus is often culturally selected as a trait that a supernatural entity ought to possess. Indeed, the kinds of gods that are believed in and prayed to all over the world

¹⁶ Boyer, 2001 pg. 158

seem to share this access to strategic personal information about people, and the ability to reward and punish people for their choices. This is what makes the idea of a god stable, and difficult to reject. Boyer sums up:

We do not have the cultural concepts we have because they make sense or are useful, but because the way our brains are put together makes it very difficult not to build them.¹⁷

So, regardless of whether or not there is a god, human minds can, and in fact are naturally predisposed to arrive at the conclusion that supernatural entities exist. Evolution has prepared us with the tools for overactive agency detection and cultural selection of salient supernatural traits, and as a byproduct we are subject to belief in gods and spirits.

5 Religious Thought as a Parasite

So far, I have given a very brief account of the natural origins of supernatural thought. We've seen that our overactive agency detection system, in conjunction with multiple rounds of cultural selection for salient traits can carry this explanation of supernatural thought as far as the predisposition to believe in an important and stable god. However, what about some of the other aspects of religion such as morality? Can a natural theory adequately explain human behaviour in this domain? Absolutely.

Although the evolution of human morality is a subject worthy of some explication itself, I will leave this task to another forum. For our purposes here, it will be sufficient to acknowledge that human morality is explicable in terms of evolutionary logic; the *mindlessly* simple process of natural selection is indeed sufficient to explain the existence of reciprocal altruism and the emotions that enforce it. However, even with the knowledge of this ultimate (versus proximate) cause, the roots of our moral intuitions are

¹⁷ Boyer, 2001 pg. 164

often illusive to conscious inspection. For example, we know that incest is wrong, even between two consenting and protected adults, but many people are dumbfounded as to *why* it is wrong.¹⁸ Situations like these elicit strong emotional “disgust” reactions that are often unavailable for detailed conscious examination. They are just plain wrong! Where do moral prescriptions like this come from? Boyer points out that although many of our evolved moral values may be grounded in genetic benefits, seeing these prescripts as the viewpoint of an interested god or spirit is much easier to comprehend. Thus, it is easy for the human mind to (and perhaps extremely difficult for it *not* to) attribute moral rules to supernatural agents who are interested in our choices, and can interact with us via fortunate and unfortunate events. In this sense, it becomes clear that although morality is completely attainable via naturalistic processes alone, supernatural ideas feed on these already existing biological intuitions. Boyer concludes:

Our evolution as a species of cooperators is sufficient to explain the actual psychology of moral reasoning... But then this requires no special concept of religious agent, no special code, no models to follow. However, once you have concepts of supernatural agents with strategic information, these are made more salient and relevant by the fact that you can easily insert them into moral reasoning that would be there in any case. To some extent religious concepts are *parasitic* upon moral intuitions.¹⁹

This exemplifies the most crucial point in Boyer’s work: supernatural, or religious concepts can be thought of as parasites, (i.e. in the sense that they are byproducts) feeding off of the organizational structure of the mind which was developed by natural selection, regardless of the existence or intervention of any supernatural agents whatsoever.

For the sake of brevity, there are many aspects of religion that have been left out of this account of supernatural thought. For example: what about sacred rituals? What

¹⁸ Haidt, 2001

¹⁹ Boyer, 2001 pg. 191

does death have to do with religion? And; how do simple supernatural thoughts turn into fully fledged organized religions? Although the specific answers to these questions would have to be addressed in a longer treatment of the topic, we now know where to start looking. All of these facets of religion can be viewed as byproducts of normal and natural mental functioning that would exist, god or no god. What we have covered here is a bare-bones theory that naturally explains the tendency for the human mind to bootstrap itself to belief in the supernatural, given nothing more than what we would expect it to have attained via natural selection over eons of time in the ancestral environment. Thus, the key point here is not to explain every facet of religious belief, but simply to provide the structure of an alternative theory to divine design. In essence, what we have found is that no god needs to be invoked to explain any of the spectrum of human behaviours, including, as it turns out, religious ones.

6 Conclusion

It was in 1802 that William Paley walked across the heath and proclaimed that because a watch exuded evidence of design, so too did humans:

There cannot be design without a designer; contrivance without a contriver; order without choice; arrangement without anything capable of arranging; subserviency and relation to a purpose, without that which could intend a purpose; means suitable to an end, and executing their office in accomplishing that end, without the end ever having been contemplated, or the means accommodated to it.²⁰

Although this argument seems simplistic by today's standards, Paley raised a hard hitting question: If we are not products of divine design, then how did we come to be the way we are? How else can we account for the mind-boggling bio-diversity we see in ourselves

²⁰ Paley, 1902 pg. 12

and all around us? As we have seen in this paper, and in innumerable other sources, there *is* a viable alternative to divine design, and it is not random chance. As Richard Dawkins succinctly defines the Darwinian alternative: “life results from the non-random survival of randomly varying replicators”.²¹ Building on this basic provisional truth, plants and animals can be viewed as survival machines, ruthlessly utilizing and capitalizing on each random variation that is beneficial, and failing to reproduce those that are not. This mindlessly simple mechanism, given enough time is sufficient to create the diversity of life we see today in all its forms. It is sufficient to explain the existence of seemingly irreducibly complex organs such as the bird’s wing, the human eye, and even the human mind. It is only a small step from here, to realize that some patterns of behaviour exist as byproducts of the beneficial functions that some of these organs perform. Such is the case with supernatural thoughts in the human mind:

Religious concepts invariably recruit resources of mental systems that would be there, religion or no. This is why religion is a likely thing. That is, given our minds’ evolved dispositions, the way we live in groups, the way we communicate with other people and the way we produce inferences, it is very likely that we will find in any human group some religious representations...²²

Indeed, the kamikaze moth that burns itself in the candle flame, and the religiously devout suicide bomber are both subject to the oft-maladaptive byproducts of their exceedingly adaptive mental functioning.

Having briefly explicated a natural theory of supernatural thought, the frustrating point is that this is where the science ends. Extrapolating the findings of Boyer, Dawkins and Dennett (among others) to policy decisions and moral prescriptions is beyond the realm of the scientific method, and thus, beyond the scope of this paper. We have made

²¹ Dawkins, 1976

²² Boyer, 2001 pg. 321

claims here about how the world *is*, and excluded much of the conversation regarding how the world *ought* to be in light of this information. However, as a final consideration, I would like to point out that although the impact Darwinism seems to change everything, in a sense it also leaves everything the same. When asked about the state of humanity given the truth of Darwinism, Daniel Dennett had the following reply:

I think it leaves us almost exactly where we've always been. We get a clearer view of the actual machinery of our souls. But what we thought our souls were good for – for loving, for deciding, for making and breaking promises, for reasons good and bad – goes on. And we're just a little bit disillusioned about the nature of that process. But our moral quandaries are what they were before, our moral aspirations are what they were before, and our capacities to love and to hate remain intact. When I speak of Darwinism as a universal acid, it passes through, it changes everything, and it leaves everything the same too.²³

Such is the case with Darwinism as it applies to religion in the human mind. Although the truth of Darwinian approach may dismiss the *technical* truth of supernatural entities, and thus religion, it does not thereby remove any of the qualities that we have always believed to make us human. With the application of the scientific method – finding evidence, postulating a theory, and testing predictions against that theory – we have simply found that our humanity is composed just a little bit differently that we've always intuited. As Dennett was once veridically misinterpreted by an Italian journalist: “Yes, we have a soul. But it's made of lots of tiny robots”²⁴

²³ Miller, 2004

²⁴ Miller, 2004

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