Faith and Philosophy: Journal of the Society of Christian Philosophers

Volume 27 | Issue 2 Article 4

4-1-2010

Reformed Epistemology and the Cognitive Science of Religion

Kelly James Clark

Justin L. Barrett

REFORMED EPISTEMOLOGY AND THE COGNITIVE SCIENCE OF RELIGION

Kelly James Clark and Justin L. Barrett

Reformed epistemology and cognitive science have remarkably converged on belief in God. Reformed epistemology holds that belief in God is basic—that is, belief in God is a natural, non-inferential belief that is immediately produced by a cognitive faculty. Cognitive science of religion also holds that belief in gods is (often) non-reflectively and instinctively produced—that is, non-inferentially and automatically produced by a cognitive faculty or system. But there are differences. In this paper, we will show some remarkable points of convergence, and a few points of divergence, between Reformed epistemology and the cognitive science of religion.

Introduction

Reformed epistemology and cognitive science have remarkably converged on belief in God. Reformed epistemology holds that belief in God is basic—that is, belief in God is a natural, non-inferential belief that is immediately produced by a cognitive faculty.[1] Cognitive science of religion also holds that belief in gods is (often) non-reflectively and instinctively produced—that is, non-inferentially and automatically produced by a cognitive faculty or system.[2] But there are *prima facie* differences. Reformed epistemologists hold that the god-faculty was implanted in each person by God while the cognitive scientist typically holds that the god-faculty developed in each person through evolutionary processes. Cognitive science is the relatively recent work of empirical psychologists who find inspiration in empirical psychology and in the work of Darwin; contemporary cognitive scientists of religion include Pascal Boyer, Scott Atran, and Justin Barrett. Both

[1]See Alvin Plantinga, *Warranted Christian Belief* (New York: Oxford University Press, 2000); Alvin Plantinga and Nicholas Wolterstorff, *Faith and Rationality* (Notre Dame: University of Notre Dame Press, 1983); Nicholas Wolterstorff, *Reason Within the Bounds of Religion* (Grand Rapids, Michigan: Eerdmans Publishing Company, 1976); and William Alston, *Perceiving God* (Ithaca: Cornell University Press, 1991). For a more popular introduction to Reformed epistemology, see Kelly James Clark, *Return to Reason* (Grand Rapids, Michigan: Eerdmans Publishing Company, 1990).

[2]Cognitive scientists of religion differ as to whether a single cognitive device accounts for theistic beliefs (e.g., Stewart Guthrie, *Faces in the Clouds: A New Theory of Religion* [New York: Oxford University Press, 1993]), or whether a constellation of devices converge to promote belief in God (e.g., Pascal Boyer, *Religion Explained* [New York: Basic Books, 2001]). 'God faculty' is used here to refer to whatever cognitive functional unit or units are responsible for generating belief in God.

groups contend that we have natural cognitive faculties or faculties which produce belief in God immediately without the support of an inference. According to Barrett, "Belief in God or gods is not some artificial intrusion into the natural state of human affairs. Rather, belief in gods generally and God particularly arises through the natural, ordinary operation of human minds in natural ordinary environments."[3]

In this paper, we will show some remarkable points of convergence, and a few points of divergence, between Reformed epistemology and the cognitive science of religion.

Reformed Epistemology: Calvin vs. Plantinga

John Calvin believed that God provided all humans with a natural, instinctual sense of the divine, the *sensus divinitatis*, which is inscribed or written on the hearts of all people. This natural knowledge of some kind of God is that "primal and simple knowledge to which the very order of nature would have led us if Adam had remained upright."[4] This slight taste of his divinity amounts to little more than the conviction that there is a God, that humans acquire the true belief that there is a majestic creator. This knowledge includes all of the properties necessary for being creator—super powers and intellect—but little of what is necessary for human redemption. Calvin seems to hold that this knowledge of God's existence and basic attributes is present from birth and not experience-dependent.

Calvin also claims that there is an additional, external source of knowledge of God. He contends that people can behold the glory of God through the manifestation of the divine in nature; we can see God in both the vastness of the cosmos and the human person. Indeed, Calvin believes that knowledge of God is so manifest and evident that detailed arguments are unnecessary. Because God has made himself so readily available to us in his creation, detailed arguments are unnecessary. One, whether peasant or physiologist or physicist, can quite simply see the order and symmetry of the cosmos and human person and so become aware of the being on whom that order and symmetry depend.

Alvin Plantinga has advanced a notion of the *sensus divinitatis* that differs from John Calvin's. Plantinga contends that our god-faculty is dispositional and that belief in God is grounded in human experience. Plantinga argues that belief in God is produced in response to a variety of widely realized circumstances such as moments of guilt, gratitude, or a sense of God's handiwork in nature (while beholding the articulate beauty of a flower or the purple mountains majesty); in these and other circumstances, people find themselves believing in God. While Plantinga holds that belief in God, thusly produced, is based on experience, and so is not groundless, it is not, however, based on beliefs, and so is not the conclusion of an argument.

---

[3]Justin Barrett, *Why Would Anyone Believe in God?* (Lanham, Maryland: AltaMira, 2004), p. 124.

[4]John Calvin, *Institutes of the Christian Religion*, trans. Henry Beveridge (Grand Rapids, MI: Eerdmans Publishing Company, 1975), I. ii. 1.

Finally, Plantinga contends that the *sensus divinitatis* produces belief in the God of Abraham, Isaac, and Jacob, the God of the Bible.

The Cognitive Science of Religion and the Sensus Divinitatis

If the position of Reformed epistemologists is correct that the automatic, non-reflective deliverances of our cognitive faculties should be treated as innocent until proven guilty, and if humans are naturally endowed with a god-faculty or sensus divinitatis, then belief in the divine should be treated as innocent until proven guilty. Reformed epistemologists and theologians have advanced arguments for the existence of a god-faculty, but given recent scientific advances in understanding human minds, might there be scientific evidence for something like a *sensus divinitatis*? If so, which version of the god-faculty does the evidence support, Calvin's, Plantinga's, or another version altogether? In this section we present three naturalistic accounts gleaned from the cognitive science of religion literature regarding where beliefs in gods come from and compare what this contemporary science suggests with regard to Calvin's and Plantinga's characterizations of the god-faculty.

In general, cognitive science of religion rejects the popular anthropological assumption of radical incommensurability among cultural groups. Rather, studies seem to show that our common biological heritage and relatively similar environments produce relatively similar minds and, often, beliefs. Rejecting the empiricist assumption of the mind as a blank slate, cognitive science holds that our minds come equipped with cognitive faculties that actively process our perceptions and shape our conceptions of the world.[5] These common cognitive faculties are specialized subsystems that structure, inform, enhance and limit the way we think about the world around us. Some of these cognitive faculties structure, inform, enhance and limit religious beliefs. Belief in gods, to take one characteristic form of religious belief, arises from the stimulation of universal cognitive faculties. That is, because of the characteristic architecture of human minds, independent of special enculturation, humans are receptive to the existence of gods and readily reason about their activities and form collective actions (such as rituals) in response to these beliefs. From the perspective of cognitive science of religion, beliefs in gods are a natural product of our common cognitive faculties, and in this sense, religious belief is 'natural.'

While the naturalness of religion thesis has general consensus in the cognitive science of religion area, the specific way in which ordinary, natural cognitive architecture promotes belief in gods (in populations) is a subject of debate. Concerning the character of the god-faculty, at least three different types of accounts have been developed. For the following discussion, we dub these three the Attribution Account, the Dispositional Account, and the Preparedness Account. Though not necessarily incom-

[5]See Pascal Boyer, *The Naturalness of Religious Ideas: A Cognitive Theory of Religion* (Berkeley: University of California Press, 1994), Pt. II.

mensurable, the three accounts do suggest slightly different features of the god-faculty in terms of the conditions under which it is activated (input conditions) and the characteristic outputs.

The Attribution Account. The Attribution Account claims that beliefs in supernatural agents, including ghosts, ancestor-spirits, and gods, have arisen in part because human beings are equipped with a functional cognitive unit—an agency-detecting device—that identifies objects as intentional agents or events as caused by intentional agents, sometimes with only the slightest stimulation.[6] Anthropologist Stewart Guthrie has argued that this faculty for detecting agents (such as large mammals and other humans) has been tuned by natural selection to err on the side of generating false-positives. Because the presence of intentional agents in our ancestral environment would have represented our greatest threats to survival as well as greatest promise for survival and reproduction, detecting even the slightest evidence for the presence of an intentional agent would have been critical. It would be better to register that a potential helpful or dangerous agent is nearby based on scant evidence and prove to be mistaken, than miss the presence of an agent. Without such immediate beliefs/responses to certain motions (rustling bushes) or sounds (things going bump in the night), we might end up food for a predator or victim of an enemy.

The faculty responsible for attributing intentional agency to objects or to the cause of events or traces (such as tracks, crop-circles, or signs), has been termed the "hypersensitive agency detection device" (HADD); "hypersensitive" emphasizing its tuning to register false-positives instead of failing to detect actual agents by using too strict input conditions (Barrett, 2004). If it were less sensitive it would prove less adaptive.

In the normal course of human life, we perceive human forms, human faces, human voices, and artifacts, and HADD automatically, non-reflectively attributes human agency as the source. Then a second cognitive system responsible for generating inferences related to mental states—the Theory of Mind (ToM)—is activated and automatically fills in details about the (human) agent's likely beliefs, desires, emotions, and so forth. Occasionally, however, sounds, shapes, patterns, or movement trigger a 'HADD-experience,' an attribution of agency, that is inconsistent with any known natural agents such as humans or animals. In these situations, the activity of HADD may lead to the postulation of a different sort of agent such as a god. Barrett explains:

> Our minds have numerous pattern detectors that organize visual information into meaningful units. HADD remains on the lookout for patterns known to be caused by agents. If this patterned information matches patterns . . . known to be caused by agents, HADD detects agency and alerts other mental tools. . . . More interesting is when a pattern is detected that appears to be purposeful or goal directed and, secondarily, does not appear

[6]See Stewart Guthrie, "A Cognitive Theory of Religion," *Current Anthropology* 21 (1980), pp. 181–203; and also his *Faces*.

> to be caused by ordinary mechanical or biological causes. Such patterns may prompt HADD to attribute the traces to agency yet to be identified: unknown persons, animals, or space aliens, ghosts, or gods.[7]

We are equipped with pattern detectors that are fine-tuned to detect agency.[8] Upon the detection of agency the Theory of Mind (ToM) system begins operating and attributes beliefs, desires, purposes, and so forth, to the postulated agent.[9] A full-blown god concept may be fleshed out by HADD and ToM working together, automatically and non-reflectively.

This Attribution Account, championed by Stewart Guthrie, suggests that the god-faculty or *sensus divinitatis* can be roughly equated with the HADD-ToM conjunction.[10] A system principally concerned with helping us detect and reason about humans also automatically gives us beliefs in gods without conscious inferential reflection.

On the Attribution Account, then, what specific properties might these gods be prone to have? Much like humans, gods will have percepts, thoughts, beliefs, desires, goals, motivations, and emotions. Likely, they will have language, communication, and social relations. All of these basic attributes come automatically from ToM. Though Guthrie emphasizes the attribution of human properties (hence, he regards his as a new anthropomorphism theory of religion), he admits that the cognitive faculties at play invite more flexible input conditions than distinctly human agency. After all, they must accommodate non-human animals (such as saber-toothed tigers) and disguised or camouflaged agents. HADD had better be able to handle non-visible agents, and so, the idea of a fully *in*visible god does not deter this god-faculty at all. Beyond admitting the possibility that the god is invisible (and perhaps that is a chief motivation for postulating a god instead of a human), the Attribution Account does not specify any additional superhuman traits.

While not denying the possible role of HADD-experiences in generating or encouraging belief in gods, psychologist Jesse Bering has begun developing a variant on what we are calling the Attribution Account that allows for a broader range of experiences to trigger or excite thoughts about gods. On the basis of some experimental evidence with children, Bering argues for a pan-human, early-developing tendency to wonder 'what does it mean?' or 'why me?' especially with regard to experiences of striking fortune or misfortune. Bering argues that when faced by these

---

[7]Barrett, *Why Would Anyone Believe*, pp. 36–37.

[8]See Scott Atran, *In Gods We Trust* (New York: Oxford University Press, 2002), pp. 59–61.

[9]One might speculate that ToM developed as it became increasingly advantageous for primates to be able to successfully "guess" the beliefs, desires and intentions of competitors. This tendency to speculate about the intentions of competitors would then have been generalized and applied to agentive accounts that HADD engendered. As Atran writes "Identifying animate beings as agents, with goals and internal motivations, would allow our ancestors to anticipate goal-directed actions of predators, prey, friends, and foe and to profit from this in ways that enhanced survival and reproductive success. See Atran, *In Gods We Trust*, p. 61.

[10]See Guthrie, *Faces*.

sorts of experiences, we automatically speculate about the *intentions* of an unspecified agency that might account for the event and what the event means. Bering has dubbed this cognitive tendency the Existential Theory of Mind or eToM.[11] In addition to HADD-experiences, events of striking fortune or misfortune, strange coincidences, and the like prompt us to consider the intentions of the some*one* who has orchestrated the event. In this way, eToM, like HADD, may stimulate thinking about and belief in gods—gods that influence human affairs, perhaps rewarding or punishing in a morally concerned way. Indeed, Bering and colleagues have suggested that the tendency to attribute events to the activities of morally-concerned intentional agents, and hence, to believe that gods are watching as potential moral police, may be an adaptation that assisted in building cooperative communities.[12]

To summarize, if HADD + ToM + eToM is the god-faculty as the Attribution Account suggests, it is activated by specific experiences, and god-beliefs are not pre-existing tacit assumptions waiting to be activated, but are constructed in response to particular environmental stimulation. These experiences could be bumps in the night, faces in the clouds, or striking cases of fortune or misfortune. The god-belief that gets triggered will have human-like mental attributes but may also have supernatural powers, invisibility, and perhaps be morally interested in human affairs. Exactly which properties god possesses—cosmic creator, superknowing, superperceiving, immortal, immutable, or wholly good—is largely unspecified. If a version of the Attribution Account proves to be most accurate, we appear to have a *sensus divinitatis* that, in terms of input conditions, looks more like Plantinga's experientially-triggered faculty. Especially according to Bering's version that allows for a broader set of triggering experiences, this god-faculty generates empirically grounded beliefs in gods through means similar to Plantinga's characterization. Considering this god-faculty's outputs, however, it lacks the specificity of Plantinga's and looks more like Calvin's general, hazy sense of superhuman agency of some sort.

The Dispositional Account. We have dubbed this second account 'dispositional' because it suggests that a number of cognitive systems working in concert produce a general natural *disposition* for humans to embrace belief in gods of one sort or another. The most prominent representative of this account for why belief in gods is natural is anthropologist turned evolutionary psychologist Pascal Boyer. Drawing upon cognitive and evolutionary anthropology, Boyer identifies a number of cognitive systems that perform various tasks—everything from making sense of the mechanics of physical objects to negotiating social exchange relations—that converge to make belief in gods a normal, natural cultural expression.

---

[11]Jesse Bering, "The Existential Theory of Mind," *Review of General Psychology* 6 (2002), pp. 3–24.

[12]Jesse Bering and Dominic Johnson, "'O Lord . . . You Perceive my Thoughts from Afar': Recursiveness and the Evolution of Supernatural Agency," *Journal of Cognition and Culture* 5 (2005), pp. 118–142.

Boyer's account uses an epidemiological model for explaining why some ideas (like belief in gods) are relatively common across cultures. Analogously to studying the spread of disease in a population, to understand the spread of ideas in a population we must understand the properties of the host organism in relation to the potentially 'infecting' ideas and how they might spread from person to person.[13] In relation to religious ideas, Boyer draws upon experimental evidence to argue that successful ideas will be those that (1) are easily and readily represented by human cognitive equipment, (2) are attention-demanding regardless of cultural conditions, (3) have rich 'inferential potential' such that they readily generate inferences, explanations, and predictions relevant to many domains of human concern, and (4) motivate actions that reinforce belief, i.e., they matter.[14]

Applying these four criteria for cultural success to beliefs in superhuman agents (gods), Boyer argues that the sorts of god concepts that are widespread (in contrast with some theological abstractions and hypothetical supernatural concepts) meet all four.[15]

(1) He notes that the sorts of gods that ordinary people talk about and believe in around the world tend to closely match the way people ordinarily think about other intentional agents. Though theological discourse might suggest complex or even opaque conceptions of deities, in day-to-day life people assume that gods have minds that direct their actions as much as is the case for people: gods have percepts that guide belief-formation; gods have goals and desires that they act upon using their beliefs about the world and about how to actualize those desires; and when their desires are satisfied they experience positive affect. The idea of a god automatically activates ToM (Theory of Mind system) and all of its non-conscious assumptions. God concepts do not have to be built-up piece by piece but can ride on existing, pan-human conceptual systems. For instance, tell a child about a space-alien that has decided it wants to visit earth and you need not specify that the space-alien has beliefs, desires, emotions, and other mental properties. ToM delivers these assumptions 'for free.'

(2) Though gods capitalize on ordinary cognition (making the concepts easy to remember, think about, and communicate), they deviate from ordinary concepts in some ways that make them attention-demanding, regardless of culture. That is, Boyer argues that a distinguishing feature of those agent-concepts we identify as 'supernatural' is that they violate a small number of tacit assumptions we have relevant to their intuitive ontology. So, if the space-alien mentioned above can read minds, a property that breaches automatic ToM assumptions, then it has a feature that is attention-demanding. Mind-reading is distinctive regardless of culture because the basic assumptions delivered automatically by ToM are

[13]Dan Sperber, *Explaining Culture: A naturalistic approach* (Oxford: Blackwell, 1996).

[14]See Boyer, *Religion Explained* and *Naturalness*. Many of Scott Atran's (*In Gods*), and Justin Barrett's (*Why Would Anyone Believe*) arguments and observations are similar.

[15]See Boyer, *Religion Explained*.

pan-human. Similarly, an invisible object is always and everywhere attention-demanding because we presume that under normal conditions physical objects are visible. Having these sorts of features that violate our intuitive assumptions about things makes them *counterintuitive* in a technical sense. What counts as intuitive or counterintuitive in this sense is determined not by just one cognitive system but by a whole host of systems. An idea could violate our intuitive assumptions generated by our naïve physics system, our folk biology system, our Theory of Mind system, our folk sociology system, or any number of others.[16]

(3) Counterintuitive concepts have been shown to have a mnemonic and transmission advantages in some experimental contexts across cultures,[17] but being a counterintuitive agent is not enough to be a god. The result of the counterintuitive feature(s) must make the agent concept rich in 'inferential potential'—the ability to readily produce inferences, explanations, and predictions that would not normally follow from the object. Consider a tree that can listen to conversations. By virtue of the counterintuitive property of being able to listen to conversations, the tree has become an agent with some inferential potential. If the tree can listen to conversations, can it tell secrets about me? Does it know what I did near here last week? Similarly, a person that can read minds or is invisible seems to have more inferential potential than a person who has metal inside parts or an invisible potato. Boyer observes that religions around the world feature counterintuitive agent concepts with high inferential potential, not invisible potatoes or vanishing sofas and the like.

(4) Those concepts that have inferential potential in domains that deeply concern humans in ordinary life, principally concerning the moral-laden areas of social interaction, matter more to people and are more likely to be entertained and acted upon. The god who knows about how many ants are in the Amazon basin and will never act upon the knowledge is unlikely to matter to many people compared to the god who knows whether my neighbor is a practicing witch bent on destroying me and also may act upon that information. It is the latter kind of god that motivates changes in behavior including inhibiting anti-social actions, promoting pro-social actions, and attempting to influence the gods through ritual or prayer. Acting upon beliefs helps increase one's own commitment as well as serving as a sign of commitment to others. These cultural selection pressures imply that morally interested gods will be more successful than disinterested ones.

---

[16]For a more complete discussion see Boyer, *Naturalness* and *Religion Explained*. For evidence regarding the various intuitive cognitive systems see *Mapping the Mind: Domain Specificity in Cognition and Culture*, ed. L. A. Hirschfeld and S. A. Gelman (Cambridge: Cambridge University Press, 1994).

[17]Pascal Boyer and Charles Ramble, "Cognitive Templates for Religious Concepts: Cross-cultural Evidence for Recall of Counter-intuitive Representations," *Cognitive Science* 25 (2001), pp. 535–564; Justin Barrett and Melanie Nyhof, "Spreading Non-natural Concepts: the Role of Intuitive Conceptual Structures in Memory and Transmission of Cultural Materials," *Journal of Cognition and Culture* 1 (2001), pp. 69–100.

From the perspective of the Dispositional Account, rather than the god-faculty being two or three closely-tied mechanisms, the god-faculty would be an emergent product or byproduct of a host of cognitive mechanisms. Belief in god arises naturally because the normal function of human cognitive architecture in ordinary historically-prevalent human environments invites the rapid spread and resilience of god beliefs. God beliefs, then, are available in any cultural environment and human minds are predisposed to embrace them, act upon them, and pass them along. Because of how human minds work, minds are extremely vulnerable to infection by god beliefs. The requisite cognitive machinery—the god-faculty or *sensus divinitatis*—on this account is naturally in place in early childhood. In that way, it approximates Calvin's emphasis on the innateness of the *sensus divinitatis*. Special experiences are not needed to trigger belief. (Boyer is skeptical that HADD plays an important role in generating or promoting religious belief.) Also congruent with Calvin's position, the outputs of this god-faculty are vague: the god will not be identical with a human (or it would not be attention-demanding and have richer inferential potential), but it could have any number of properties such as being invisible, superknowing, superperceiving, superpowerful. The bias toward particular superhuman properties is not part of the faculty aside from their being socially relevant. If an invisible god has access to my socially- and morally-relevant secrets, then invisibility is dispositionally supported, but mind-reading, or being all-knowing, or being extremely stealthy (but not invisible) are just as well supported. In terms of input conditions (no special experiences) and outputs (vaguely super), the Dispositional Account fits well with Calvin's notion of *sensus divinitatis*—certainly better than with Plantinga's. Where the Dispositional Account fails to support Calvin is with regard to intuiting that the god is the cosmic creator. For this attribute, insights from the third account—the Preparedness Account—would need to be imported.

The Preparedness Account. Developmental psychologists studying religious concept acquisition have proposed that the early-developing conceptual structures in children include some biases that 'prepare' children to embrace the existence of gods. In particular, children may be predisposed by the default positions of their conceptual equipment to see the natural world as designed by a superpowerful being, one that is also likely to be superperceiving, superknowing and (perhaps) immortal. Such a set of predilections may help explain why belief in gods passes so easily from parents to children. So strong might these early-developing cognitive biases be that developmental psychologist Deborah Kelemen has suggested children are 'intuitive theists.'[18]

These bold claims are backed up by suggestive experimental evidence. Research by Kelemen and her collaborators has shown that young

[18]Deborah Kelemen, "Are Children 'Intuitive Theists'? Reasoning about Purpose and Design in Nature," *Psychology Science* 15 (2004), p. 295.

American and British children (at least) have a tendency to see animals, other living things, and natural non-living objects (such as rocks) as purposefully designed—a phenomenon she has labeled 'promiscuous teleology.' Importantly, children offer and endorse teleological explanations for features of natural objects (e.g., a rock is pointy so that animals will not sit on it and crush it) that cannot simply be explained by appeal to adult instruction. Adults in America and the United Kingdom do not teach that the first river was there *so that* people could boat on it and that rocks are pointy *so that* animals don't sit on them, and the like. But their children offer these explanations. Further, young children—perhaps as young as one-year-old, based on some experiments—appreciate that it takes some*one* to create order or purpose, not just some*thing*.[19] They also appear to know that the some*one* is not human.[20] No wonder that when presented with the idea that God designed and created the natural world, children find the idea so intuitively satisfying—so much so, in fact, that they are resistant to alternative explanations (such as evolution by natural selection) until fairly late in childhood.[21] More research in other cultures is needed, but the emerging picture from what we are calling the Preparedness Approach is that the ordinary cognitive equipment of children strongly encourages them to believe in some kind of creator deity or deities.

Additional research on children's understanding of minds suggests that their default setting as preschoolers is that others' minds are super-knowing, superperceiving, and (perhaps) immortal. Children assume superhuman capabilities on these dimensions when applied to people, to many animals, or to gods. They then pare back the super-ness as they learn about human perceptual fallibility, limitations on knowledge, and mortality. In this respect, a god that has super knowledge, super perception, and/or is immortal, requires less learning for these preschoolers than learning about humans. Due to the default settings on their conceptual systems, children are 'prepared' to understand many aspects of a super creator God.[22]

---

[19]See Kelemen, "Reasoning," for a brief review; and G. E. Newman, F. C. Keil, V. Kuhlmeier, and K. Wynn, "12 Month-olds Know That Agents Defy Entropy: Exploring the Relationship Between Order and Intentionality," *Society for Research in Child Development* (April 2005), Atlanta, GA, for a recent experiment with toddlers.

[20]Susan Gelman and K. E. Kremer, "Understanding Natural cause: Children's explanations of how objects and their properties originate," *Child Development* 62 (1991), pp. 396–414.

[21]E. Margaret Evans, "Cognitive and Contextual factors in the Emergence of Diverse Belief Systems: Creation versus Evolution," *Cognitive Psychology* 42 (2001), pp. 217–266, found that adult instruction regarding the non-creationist origins of animals did not start getting traction until after ten years old.

[22]For a more complete review of the relevant literature see Justin Barrett and Rebekah Richert, "Anthropomorphism or Preparedness? Exploring Children's God Concepts," *Review of Religious Research* 44 (2003), pp. 300–312; and Barrett, *Why Would Anyone Believe*, especially chapter 6. Evidence is thinner for the intuitiveness of immortality, but the presumption that minds do not automatically stop or die at some point has been suggested by Boyer, *Religion Explained*; Jessie Bering, "The Folk Psychology of Souls," *Behavioral and Brain Sciences*

From the perspective of the Preparedness Approach in cognitive science of religion, the god-faculty or *sensus divinitatis* carries much more specificity than the other two approaches. It begins to look much like Plantinga's *sensus divinitatis* in terms of the outputs it delivers. In terms of requisite inputs, however, the god-faculty more closely resembles Calvin's characterization. It appears to emerge as a normal part of development, not requiring any special pivotal experiences. Children automatically see the natural world as having intelligent, intentional design and purpose and are prone to see the creator as superknowing, superperceiving, and immortal. The only 'triggering' necessary is for the particular name of the Creator to be specified.

Both the Dispositional and the Preparedness Approaches from the cognitive science of religion emphasize early-developing cognitive architecture that will typically produce belief in some kind of god as a matter of normal human development, usually in early childhood. In this respect they resonate with Calvin's view of the *sensus divinitatis*, whereas the Attributional Approach and its emphasis on experiential triggers converges with Plantinga's position. In terms of Plantinga-like specificity, however, only the Preparedness Approach suggests the level of detail, drawing closer to a *sensus dei* than the other two approaches.

A couple of additional qualifications may be helpful. The Attributional Approach presents the god-faculty as grounded in experience much like Plantinga's account, but the sub-approach emphasizing the activity of HADD is not a perfect match with Plantinga's account because Plantinga's understanding of the widely realized grounding circumstances has little in common with HADD's more specific generation of god beliefs primarily in those circumstances under which the immediate response is flight or fight. Plantinga's grounding conditions are more pastoral, tranquil and thoughtful (but non-inferential), more accommodating to the situations that trigger Bering's eToM (existential Theory of Mind) than to the activation of HADD. HADD's grounding conditions are (largely but not exclusively) ignorance and terror. On this matter, Calvin may be closer to the HADD variant of the Attibutional Approach; he quotes Statius favorably: "Fear first made gods in the world."[23] While Calvin surely did not have HADD in mind when he affirmed Statius's sentiment, he did believe that humans are compelled to believe in God under conditions of fear.

Note that for all three cognitive science of religion approaches to the origins of god beliefs the cognitive equipment that does the work of producing god beliefs (the god-faculty) is assumed to be a byproduct or *spandrel* from an evolutionary perspective. That is, instead of being selected for because of its contribution to adaptive behaviors, the god-faculty has emerged out of the evolution of other competencies that are adaptations.

---

29 (2006), pp. 453–498; and perhaps most thoroughly by Paul Bloom in *Descartes' Baby: How the Science of Child Development Explains what Makes us Human* (New York, New York: Basic Books, 2004).

[23]Calvin, *Institutes*: I. iv. 4.

Neither Calvin nor Plantinga treat belief in God as an evolutionary spandrel as suggested by those who offer evolutionary accounts. According to Plantinga, belief in God is the direct and intended product of the god-faculty, not an epiphenomenal by-product of an agency-detecting device. If the HADD-emphasizing approach is correct, its localized, fear-based activation of any number of agent beliefs would suggest that a world of ghosts, fairies, and goblins may be the direct by-product of our god-faculty, not monotheism.

Reformed rejoinders. Reformed thinkers might offer two responses to these differences. First, they might contend that the *sensus divinitatis* is present in humans but not in quite the shape that they originally specified; for instance, that the *sensus divinitatis* is HADD + ToM. Why, after all, could God not have produced in us, through the processes of evolution, a god-faculty that makes humans universally aware of God under widely realized circumstances (just different ones from those that Calvin asserted)? There are analogues here to, say, the Freudian critiques of religious belief. Freud contended that we wish God into existence and "God" hears our prayers: God can tame nature, help us accept our fate, and reward us for our sufferings. By revealing our desire for the divine, masking deeply insecure self-interest, Freud thinks he has explained God away. But a Reformed thinker might hold that Freud is right in his explanation of belief in God but not in his explaining it away; that is, she might think that Freud's account is an accurate description of the divinely implanted, truth-aimed *sensus divinitatis* and so is a proper ground of belief. Why, after all, could God not have produced in humans a Freudian god-faculty that makes humans universally aware of God under widely realized circumstances? After all, the *sensus divinitatis*, assuming there is one, must have some determinate shape or form. Why not the Freudian or HADD shape and form? As Plantinga writes of Freud-Marx critiques of belief in God: "To show that there are natural processes that produce religious belief does nothing . . . to discredit it; perhaps God designed us in such a way that it is by virtue of those processes that we come to have knowledge of him."[24] Surely God can use ignoble vessels, even spandrels, to transport belief in God.

Explaining or Explaining Away?

While Reformed epistemologists defend the rationality of religious belief, some cognitive scientists of religion are wont to explain religion away. Both groups contend that religious belief producing mechanisms are both natural and universal, but evolutionary cognitive scientists often contend that by showing that religious belief is natural, it is, thereby, shown to be unwarranted. Pascal Boyer, for example, writes: "In a cultural context where this hugely successful [scientific] way of understanding the world has debunked one supernatural claim after another, there is a strong impulse [among the religious] to find at least *one* domain where it would be possible to trump the scientist. . . . But evolution and microbiology

[24]Plantinga, *Warranted Christian Belief*, p. 145.

crushed all this."[25] He claims that evolutionary cognitive science explains religion away as an "airy nothing," as but a byproduct of evolved human minds.[26] Let us suppose, for the sake of argument, that there is a successful, natural explanation of religious belief of the kind discussed in this paper.[27] Would such an explanation per force undermine the rational justification of religious belief?

The first thing to note is that belief spandrels or by-product beliefs may be true and justified (and are often widely accepted as such). Let us proceed by analogy. Assuming the evolutionary origins of our cognitive faculties, modern science is constituted by belief spandrels. Modern science is a by-product of cognitive faculties that were developed long before, say, 1600. The relevantly specified cognitive faculties developed to help us fight, flee, feed and reproduce.[28] These faculties proved enormously useful for millennia. Yet they were not developed to help *Homo sapiens* grasp relativity theory or the advanced mathematics that relativity theory includes. Molecular biologist Gunther Stent has argued that the innate structures of the evolved brain are well suited to handling immediate experience but are poorly suited to those areas of most interest to scientific inquiry.[29] Noam Chomsky puts the problem thusly: "The experience that shaped the course of evolution offers no hint of the problems to be faced in the sciences, and the ability to solve these problems could hardly have been a factor in evolution."[30] Furthermore, Scott Atraní's claim that religions are not adaptations, have no evolutionary functions, and were not produced directly via natural selection could be made of modern science (and, no doubt, many other domains of human inquiry) as well. And if one rejects belief in God because it is an evolutionary spandrel, one should also, *mutatis mutandis*, reject modern science's constituent beliefs. Indeed, Atran's arguments are self-reflexive: Atranic speculation is an evolutionary spandrel, therefore, it should be rejected. But perhaps a better way to proceed is simply to treat the deliverances of our cognitive faculties as innocent (*prima facie* justified) until proven guilty (*ultima facie* defeated). Moreover, one might think that most of our cognitive faculties or faculties do double duty: their original, primitive survival-enhancing duty and their much later reflective, expansive, non-survival enhancing manifestations.

---

[25]Boyer, *Religion Explained*, p. 76.

[26]Ibid., 4.

[27]We don't assume that there is as yet a successful natural explanation of religious belief. The jury is still out on that.

[28]One might think, given that truth is irrelevant to the selection process, that true beliefs are irrelevant; that is, that survival behavior is all that is selected (see Plantinga, *Warrant and Proper Function*, pp. 216–237).

[29]Stent, "Limits to the Scientific Understanding of Man," *Science* 187 no. 4181 (1975), pp. 1052–1057.

[30]Noam Chomsky, *Language and the Problem of Knowledge* (Cambridge, Massachusetts: The MIT Press, 1987), p. 158.

But perhaps the issue of justification goes as follows. Unlike scientific beliefs for which there is publicly available evidence, there is no such evidence for God's existence and so the god-faculty produces beliefs in an evidential vacuum. Moreover, beliefs produced by the god-faculty in the absence of evidence are wildly divergent and so the god-faculty cannot produce justified religious beliefs because it is not reliable. After all, the god-faculty, without divine prompting, produces beliefs in a multiplicity of gods, angels, fairies, demons, etc. Even supposing the truth of monotheism, the reliability of the god-faculty is less than 1/2 (supposing we take as the denominator the number of kinds of entities produced by the god-faculty and as the numerator the single class of Yahwistic monotheism).

Reformed thinkers might respond that the initial function of the god-faculty alone (that is, independent of any particular religious experience or putative revelation) is to make humans aware, in the most ordinary of circumstances, of the sacred dimension of reality rather than clearly defined Judeo-Christian conceptions of God; on this view, God might be willing to concede culturally specific differences in order to produce, by and large, true belief in a divine being. So, while the god-faculty alone (in ordinary circumstances unprompted by God) may be unreliable in securing belief in Yahweh and Yahweh alone, it may be reliable in producing belief in a divinity. Calvin himself claimed little specific knowledge of divinity through the *sensus divinitatis*; one's slight taste of divinity, recall, is impure and unclear. Indeed, such surface impurities and unclarities might include elves and fairies. But such culturally informed but divergent beliefs may contain a set of common core beliefs in, say, a superknower that exercises moral providence. This core knowledge of divinity may provide adequate moral and spiritual truth to bind humans into cooperative communities and to begin the human spiritual journey. So the god-faculty alone (without any special supernatural prompting) could produce reliable core beliefs in a morally provident superknower despite apparent surface and culturally specific dissimilarities. If there is a god, then the god-faculty may be reliable even though it produces surface beliefs that are not fully true.

However, while beliefs produced by one's cognitive faculties in the appropriate circumstances may be *prima facie* justified or rational, the justification or rationality of those beliefs may be defeated by being overridden or undermined by others of one's beliefs. Subsequent increases in human knowledge, especially as one becomes aware of natural explanations of phenomena previously accounted for by, say, elves or nature "gods," may defeat the justification of these quasi-divine beliefs. The Reformed epistemologist shouldn't be concerned that these false religious beliefs are winnowed away by increases in knowledge. Indeed, she might think that the proper role of reason in these cases is to assist in the rejection of false, finite, or defective religious beliefs.

Should this winnowing extend to all religious beliefs? Should the natural explanation of religious beliefs undermine or override all of one's

initially justified religious beliefs? Are such beliefs, in the absence of publicly available evidence, *per force* defective? For purposes of the argument, let us suppose, contra important voices to the contrary, that there is no publicly available evidence in support of theism. Do "scientific," natural explanations of religious belief in the absence of publicly available evidence imply that religious beliefs are irrational or unjustified?

Suppose there is a Yahwistic god and that one has an experience of this god. In this circumstance, according to the Reformed epistemologist, the god-faculty is operating under optimal conditions for producing reliable religious beliefs. These experiential grounds, cognized through the god-faculty, are justifying grounds of religious belief. The development of the god-faculty through evolutionary processes prepares one for the acquisition of true religious beliefs when one has genuine religious experiences.[31] The god-faculty produces true religious beliefs in optimal environments (that is, those where one is prompted by God and not by things that go bump in the night). How those faculties were developed is irrelevant to the account of the belief's justification. Coming to learn that these faculties were developed naturally does not constitute a defeater for the justification of belief in God.[32]

So, for the religious believer with an experience of God, natural explanations of religious belief need not defeat one's justification for belief in God. The atheist or agnostic inquirer, however, might affirm the god-faculty as the best explanation of relatively universal religious beliefs yet hold the faculty to be unreliable since, according to them, there is no god. Nothing in their experience forces them to accept the rationality of theistic belief for them. But we could not *know* that the god-faculty is unreliable in this sort of case unless we already know that there is no God. Of course, if one doesn't believe in God, one won't believe the god-faculty to be reliable, but one's beliefs on this matter scarcely constitute evidence that there is no God.

Obstinacy in Belief

One area of agreement between Calvin and cognitive science is that belief in God is the natural state of belief for humans and can never be entirely gotten rid of. Belief in God is produced by our primal and instinctive dispositions to believe in various circumstances. Unbelief is unnatural in the sense that rejection of God's existence involves suppressing our natural belief dispositions. It may not be unnatural all things considered (for presumably unbelief involves other, natural cognitive faculties such as reasoning), but widespread disbelief in any and all supernatural agents is not primitive and instinctual and so must be cultivated. Yet, given the promptings of our primitive and instinctive god and immortality facul-

[31]Even if there is no publicly available evidence, religious experience may constitute privately available evidence. See Alston, *Perceiving God*.

[32]This parallels Plantinga's discussion of warranted Christian belief in Plantinga, *Warranted Christian Belief*.

ties, belief in God may never be entirely erased from one's set of beliefs; it will repeatedly find its way back in spite of our best efforts to resist it. Studies in cognitive science and personal reflection on the part of atheistic cognitive scientists has shown that religious beliefs come creeping back into one's consciousness despite one's best efforts to rid oneself of them. For example, the death of a loved one can provoke a native belief in the immortality of souls and very frightening experiences can lead one to pray to or blame God.[33]

Conclusion

Reformed epistemology and the cognitive science of religion have converged on the nature and extent of the god-faculty and the beliefs thusly produced. The empirical work of the cognitive scientist can be seen as both a support for and a challenge to particular philosophical or theological understandings of the god-faculty and god-beliefs. We have not explored the Reformed epistemologist's responses in the desired depth; nor have we explored all of the Reformed epistemologist's possible responses. Yet we have indicated ways the Reformed epistemologist might respond to the similarities, differences and dismissiveness of some of the views of some cognitive scientists. Since the cognitive science is in its infancy, it's too early to commit to any particular cognitive model for understanding and explaining the god-faculty. Many of the claims of cognitive science of religion require additional empirical evidence—particularly cross-cultural data—before confident universal conclusions may be drawn. If these results can be universalized and made consonant with Reformed epistemology, we may find empirical support for a philosophical theory. This support, however, may come with some costs, requiring the rethinking of the god-faculty or the justification of religious belief.

Kelly James Clark, Calvin College

Justin L. Barrett, Institute of Cognitive and Evolutionary Anthropology, Oxford University

[33]See Barrett, *Why Would Anyone Believe*, chap. 8; and Bering, "The Existential Theory of Mind."