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THE NATURALNESS OF RELIGIOUS IDEAS: SOUNDINGS FROM THE COGNITIVE SCIENCE OF RELIGION

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This paper offers a brief introduction, summary, and commentary on the cognitive science of religion (CSR), a burgeoning, interdisciplinary field of study that examines the way mental resources and predispositions facilitate religious beliefs and behavior. This presentation of CSR devotes special attention to research on teleological bias, agency detection, and counterintuitive concepts; moreover, critical discussions of mystical experience and god concepts ensue from treatments of the latter two topics. Research on teleological bias, agency detection, and counterintuitiveness supports the basic position that religious cognition is natural, although distinctive rationales are associated with each topic of investigation. While the major focus of this article is epistemological – how religious thought develops and is sustained – the conclusion briefly addresses the ontological significance of basic CSR findings.

Keywords: cognitive science of religion, teleological bias, hypersensitive agency detection, mystical experience, counterintuitive concepts, God concepts, religious epistemology

ЕСТЕСТВЕННОСТЬ РЕЛИГИОЗНЫХ ИДЕЙ: ОТЗВУКИ КОГНИТИВНОГО РЕЛИГИОВЕДЕНИЯ

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Данная статья представляет краткое введение и комментарий по поводу когнитивной науке о религии – развивающемуся междисциплинарному проекту, направленному на исследование того, каким образом ментальные особенности и предрасположенности способствуют закреплению религиозных убеждений и религиозного поведения. В рамках данного обзор особое внимание уделяется исследованию телеологических предрассудков, контринтуитивных понятий, а также критических дискуссий по поводу мистического опыта и концепций бога. Это исследование направлено на обоснование идеи о том, что религиозное познание осуществляется естественным (органичным) образом. И хотя акцент делается на эпистемологическом измерении проблемы (на том, каким образом развивается и воспроизводится религиозное мышление), автор также дает краткое заключение об онтологическом значении основных достижений когнитивной науки о религии.

Ключевые слова: когнитивная наука религии, телеологические предрассудки, мистический опыт, контринтуитивные понятия, концепции бога, религиозная эпистемология

Introduction

While waiting for my plane to begin boarding during one of my recent travels, I found myself in a "science and religion" conversation with a self-described atheist at an airport coffee shop. During the course of our conversation she mentioned that wearing a cross around her neck had long been her custom, but that recently she felt compelled to remove the cross because she felt it was a source of "bad luck". Seeing that she was oblivious to the irony this statement seemed to convey given her previous "non-religious" identification, I felt compelled to give notice. She was taken aback by the fact that she would so easily embrace "religious" thinking. In response, I claimed that many religious concepts or ideas have a broadly intuitive appeal, making it likely that even atheists will occasionally entertain them. Put differently, the characteristics of human minds are such that,under certain situations, ideas that qualify as religious can take hold without sustained deliberation. Indeed, the fact that my conversation partner identified as an atheist but continued to entertain religious thinking seems to suggest that in some situations religious explanations might form or be recalled more immediately than non-religious ones [cf. Spilka, Shaver, Kirkpatrick, 1985; Sears, 2016]. While religious explanations may not be ultimately irresistible, they can be initially compelling.

As this example helps to illustrate, religious thought is a near ubiquitous and broadly intuitive phenomenon. What makes religious thinking so intuitive or natural for the general population to grasp represents the chief line of inquiry for the cognitive science of religion (CSR)[1]. The purpose of this paper is to introduce this field of study as well as summarize and comment on some of its salient findings pertaining to religious cognition. The final section will briefly consider some possible ontological implications of these findings.

[1] The term "natural" has multiple meanings that are relevant to our discussion. In one sense "natural" implies that something occurs as a matter of course without some sort of extraordinary intervention. This sense of the term "natural" is the dominant one employed throughout this paper. "Natural" can also mean that something is endemic to humanity or the world in which humans live. Additionally, "natural" can mean that something is "mundane", i.e., not "spiritual" or "supernatural" [Sears, 2016]. This latter meaning of the term is rather infrequently used in this presentation. Use of "natural" in context should hopefully imply its meaning.

Cognitive science and religion: the basics

Like cognitive science in general, CSR is an interdisciplinary field of research informed by anthropology, psychology, computer science, neuroscience, philosophy, and other disciplines [Barrett, 2011, p. 12]. Now considered to be more than 20 years old [cf. Hornbeck, Sears, 2015, p. 71], CSR remains a relatively young, burgeoning field of inquiry. Researchers associated with CSR are basically united in their attempt to explain religious thought and behavior in terms of its origin in mental predispositions and resources. CSR researchers generally approach their work with the understanding that *something* is religious if people commonly think it to be so – and thus use terms like "religious", "spiritual", etc., to describe it [Barrett, 2011; Taves, 2009; Sears, 2016][2]. Although some researchers will attempt to justify specific thoughts or behaviors as religious by documenting actual uses of religious terminology [Sears, 2016], others seemingly rely on common sense understandings of religious phenomena to frame their analyses [e.g., see Barrett, 2000, 2004, 2011; Boyer, 2001]. Ultimately, identifying which phenomena are religious is a prerequisite to exploring their cognitive origins and potential.

However CSR researchers initially identify certain thoughts and behaviors as religious,they generally agree that such are naturally occurring functions of the mind-brain (henceforth "mind") due to the way the mind has been shaped by genetic and environmental factors [Barrett, 2000, 2004, 2011; Boyer, 2001, 2003; Hornbeck, Sears, 2015]. Furthermore, cognitive scientists generally agree that humans share a variety of genetic and environmental conditions that facilitate religious thoughts and behaviors [ibid.]; this claim is tied to the repeated finding that separate human populations (cultural groups) indeed share many religious sensibilities in common [e.g., see Barrett, 2011; Boyer, 2001; Sears, 2016; Taves, 2009].The foregoing should obviously not be taken to mean that cultures are identical, nor that humans share all religious sensibilities in common. Irregular circumstances likewise contribute to individuals' religious cognition. Nonetheless,environmental and genetic regularities seem to engender many of the basic mental predilections and resources used to accommodate religious concepts [Hornbeck and Sears 2015; Barrett 2004]. Furthermore, such regularities and the predilections/resources they entail contribute to consistent religious thoughts and behaviors across

[2] While "religious", "spiritual", and the like are English words, non-English speakers typically use words that carry many of the same connotations as the English ones [Sears, 2016]. Indeed, the very fact of translation indicates that a variety of linguistic groups share ideas in common – including those that relate to the English concept of "religion". Although I use English terms in this article, they refer to generally relevant concepts.

cultures [ibid.]. That humans acquire many of the same basic mental predilections/resources and corresponding religious sensibilities without the aid of cultural or other particulars is a fact that underwrites religion/religious cognition as a naturally occurring phenomenon.

Additionally, it should be noted that CSR researchers frequently refer to evolutionary theory to explain how the mind has been shaped by environmental conditions to allow for religious thought/behavior [e.g., Boyer, 2001, 2003; Barrett, 2004, 2011]. Take, for example, the agency detection device that humans use to differentiate agents from other stimuli. Cognitive scientists have documented support for such a device, along with the notion that this device is generally hypersensitive (see below). One popular account for this device and its hypersensitivity is that our ancestors needed to respond to the threat of agents quickly in order to increase their likelihood of survival. Although the device's hypersensitivity might result in a fight-or-flight response when no physical agent is present, this would not lead to significant negative consequences; on the contrary, a less sensitive agency detection device would be less likely to sense an actual agent – such as a predator or rival human – which could be disastrous [see Barrett, 2004, p. 31]. As this case illustrates, evolutionary theory provides concepts that cognitive scientists sometimes recruit in their attempts to explain particular mental phenomena.

Empirically grounded cognitive explanations of religion

CSR researchers rely heavily on cross-cultural and child development studies to support their basic contention that religious thought and behavior are natural phenomena. Cross-cultural studies can evidence the spread of religious beliefs and behaviors, as well as related faculties. A broad extent of specific beliefs/behaviors is indicative of their being a naturally occurring consequence of being human rather than a consequence of cultural or other particulars [Barrett, 2011, p. 28]. Child development studies can likewise commend certain dispositions as "maturationally natural" [ibid.; cf. McCauley, 2011]. Maturationally natural concepts and abilities are not necessarily "hardwired" or "innate" [Barrett, 2011, p. 29]; still, these concepts/abilities typically appear or develop in the early years of life with impressive regularity. Furthermore, maturationally natural abilities (such as standing/balancing) should be distinguished from those derived by expertise or special training (such as riding a bike) [see Barrett, 2011, p. 27–29]. By virtue of their age or experience,children are generally good subjects from which to observe maturationally natural phenomena.

Given this background, it will now be instructive to consider some specific lines of research that demonstrate how general human conditions prepare people to form and sustain religious beliefs as a matter of course.

The teleological/design stance

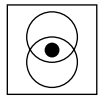
The study of child cognition by Deborah Kelemen and others suggests that children (~6-10yo) have a significant tendency to endorse teleo-functional vs. physical-causal explanations for natural objects [Kelemen, 1999; Kelemen, DiYanni, 2005]. In other words, children (generally) are more likely to explain what a natural object is for ("rocks are pointy so animals don't sit on them") in contrast to how an object might result from physical circumstances ("rocks are pointy as a result of wind and erosion") [Kelemen, 1999][3]. Although the teleo-functional bias subsides in adolescence and adulthood for science-educated persons, it continues to manifest under cognitive stress conditions [Kelemen, Rosset, 2009][4]. Moreover, educationally underprivileged adults "remain promiscuously teleological" [Kelemen, DiYanni, 2005, p. 25; Casler, Kelemen, 2008][5]. Altogether, these findings suggest that teleo-functional explanations for natural things are intuitively satisfying. Greater educational exposure/socialization seems to temper the teleological bias in humans, but the former remains cognitively basic (at least for certain types of explanatory tasks). As Kelemen and DiYanni argue, "[teleo-functional] intuitions are a developmental constant, providing the explanatory default or 'backdrop' against which alternative explanatory strategies are elaborated over a lifetime" [Kelemen, DiYanni, 2005, p. 25].

Findings like those just described quite possibly suggest that humans have a propensity towards developing, endorsing, or at least being tempted by theistic beliefs (and concomitant behavior).This contention is based on a common link between purpose and design. Artifacts, for example, have a purpose that they were initially designed for. If this link is true/observable for certain things such as artifacts, it is conceivable that children/people would apply it to other things they see as having a purpose, such as rivers,

[3] This preference for teleological explanations is found in both open-ended and close-ended explanatory tasks (although older children are more likely to use physical-causal explanations in close-ended tasks) [Kelemen, DiYanni, 2005].

[4] In fact, college-educated adults continue to endorse teleo-functional explanations for natural things under non-stress conditions, but this is much less common than physical-causal explanations on the whole [Kelemen, Rosset, 2009].

[5] While it is natural for science-educated adults to use teleological explanations for some categories of objects (e.g., artifacts), educationally underprivileged adults (and children less than 10yo generally) will use teleological explanations "promiscuously", i.e., without discrimination between object categories.



mountains, and the sun [Kelemen, DiYanni, 2005, p. 6]. Experiencing the world as designed is consistent with the belief that it has a Designer. Thus, an inherent teleological stance would seemingly provide fertile ground for theistic beliefs to develop and take hold. In line with these expectations, Kelemen and DiYanni [2005] found that children's teleo-functional and intelligent design explanations for natural phenomena were positively correlated.

Hypersensitive agency detection

In addition to being promiscuously teleological, human beings tend to be "hypersensitive" (or "hyperactive") detectors of agency [Barrett, 2000, 2004, 2011]. From infancy humans learn to attribute agency to certain kinds of movement [Barrett, 2011, p. 100]. In fact, humans can be "tricked" into thinking that inanimate objects displaying similar types of movement are agentive or person-like in nature [ibid.]. Beyond this, a variety of psychological and anthropological investigations suggest that persons have a tendency to attribute minded agency to particular types of things – such as ambiguous stimuli – on first blush [Barrett, 2004, 2011; Guthrie, 1980, 1993].

The phenomenon of hypersensitive agency detection is seemingly relevant to considering the origin and/or maintenance of belief in God(s), ghosts, and other invisible agents. There could be certain situations that activate agency detection in humans despite the fact that no physical agent (person or animal) was involved. In these situations humans might then be tempted to attribute responsibility to an invisible agent. Thus, humans' propensity towards agency attribution, combined with appropriate circumstances (apparently lacking a physical agent cause), could lead to the creation and/or confirmation of God and other invisible agent concepts[6].

While the foregoing argument has been variously championed by CSR researchers, Petrican and Burris [2012] have made the novel connection between agent sensitivity and mystical experience, a multifaceted phenomenon that is often typified by a sense of the world as a living, connected whole [see, e.g., Stace, 1960; Chen, Hood, Yang, , Watson, 2011; Petrican, Burris, 2012][7]. Petrican and Burris [2012] have argued

[6] Barrett [2011, p. 100, 187] has correctly noted that this explanation of god (and spirit) concepts is consistent with their referents being ontologically real or absent. In other words, the agency detection device may cause people to think invisible agents are present when in fact they are not, or it may enable people to correctly perceive their presence.

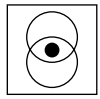
[7] This is true of the extrovertive class of mystical experience in particular. Petrican and Burris [2012] do not differentiate between introvertive and extrovertive varieties of mystical experience [see Stace, 1960], although their research focuses on the latter.

that an immanent religious orientation (characterized by a motivation to transcend boundaries) facilitates mystical experiences and is itself an outcome of overactive agency detection. Thus, mystical experience is an indirect consequence of hypersensitive agency detection. In support of their claims, Petrican and Burris document positive correlations between immanent religious orientation and mystical experience on the one hand, and hypersensitive agency detection and immanent religious orientation on the other. While the correlative nature of their findings fails to prove their argument [cf. Petrican, Burris, 2012, p. 321], their proposal raises the interesting possibility of a link between CSR and mystical experience, which has been a focal concern in religious studies since *The Varieties of Religious Experience* by William James [2012/1902].

The importance of mystical experience to religion in general is a topic of debate. William James has characterized the former as "the root and centre" of "personal religious experience" [James, 2012/1902, p. 290], which is to say mystical experience is foundational to religion as a whole [ibid., p. 32]. While similar claims can be found in the writings of theologians and other scholars of religion, some cognitive scientists downplay the role of mystical experience vis-à-vis religion as a whole [Barrett, 2004, 2011; Boyer, 2001, 2003]. According to the latter, mystical experiences have religious value, but the pervasiveness and differentiation that characterize religious thought and action cannot be reduced to the effects of mystical experience [ibid.]. Instead, they argue that general cognitive tendencies and routine (non-mystical) experiences with the world are largely responsible for the spread and general hallmarks of religious belief and behavior [ibid.].

Cognitive scientists are probably right in assuming a limited relationship between mystical experience and the complex, pervasive phenomenon of religious thought and behavior[8]. This should in no way indicate that mystical experience is of trivial importance to religion or religious faith, however. Mystical experience has been known to bolster religious faith in people with weak or practically nonexistent religious commitments [Barnard, 1997; Miller, 2016]. Additionally, it is an open question as to whether some beliefs that qualify as religious have their

[8] Since mystical experience is a multifaceted phenomenon – and individual cases of mystical experience might differ from each other regarding facet composition – studies of its incidence result in variable findings [see Marshall, 2005, p. 35–37]. Research suggests that it typically occurs in less than 50% of the population [ibid.]. Even if mystical experience were very common (a possibility if its characteristic phenomena vary in profundity), it would scarce seem to explain the great variety and complexity of religious thought. Common realizations of mystical experience include the unity of all things and the immanent presence of a transcendent reality; these are important religious conceptualizations, but they are generic and represent only some widely held religious notions. Furthermore, even if mystical experience could explain far-flung religious beliefs, this could not be taken to mean that mystical experience provides the sole or best explanation for such.



immediate origins in mystical experience (see previous footnote). Still, the work of cognitive scientists suggests explanations for religious phenomena should stretch beyond mystical experience and consider general cognitive and environmental factors. Indeed, even (extrovertive) mystical experience may derive from the general cognitive ability to detect agency within the environment.

Intuitive and counterintuitive things

This section discusses the nature and significance of intuitive categories and beliefs for (non-)religious thinking. Although popular and scholarly use of the term "intuitive" might suggest that its meaning is somewhat flexible, cognitive scientists wanting to distinguish religious from other types of ideas tend towards a precise definition. Accordingly, "intuitive" is perhaps best understood as the range of default beliefs/expectations that are reflexively generated by categorization of something into an ontological category/domain [cf. Barrett, 2008b]. Furthermore, anthropologists and psychologists have amassed evidence that suggests humans from a variety of cultural contexts share core knowledge consisting of a limited number of basic ontological categories and related information [Wellman, Gelman, 1992; Spelke, Kinzler, 2007; Barrett, 2008b; Purzycki, Willard, 2015]. The precise number and defining characteristics of these basic ontological categories is the subject of some debate [ibid.]; for our purposes, however, it will be useful to consider the general object typology endorsed by Justin Barrett [2008b, 2011][9].

According to Barrett, the mind organizes objects into five basic categories: *spatial entities, solid objects, living things that are not self-propelled*(generally considered "plants")*, animals,* and *persons*. Associated with each of these mental categories are default "expectation sets". Barrett [2008b; 2011, p. 61*ff*.] claims that there are five naturally occurring expectation sets that inform reflexive reasoning about basic object categories. These expectation sets include specific beliefs for *spatiality, physicality, biology, animacy,* and *mentality*[10]. Specific perceptual characteristics cause the mind to recognize objects according to one of the five ontological categories, which, in turn, activates specific expectation sets that are germane to the category [Purzycki, Willard, 2015,

[9] Other cognitive scientists have defended similar object typologies [see, e.g., Purzycki, Willard, 2015; Boyer, 2001]. An object typology consists of various categories of objects. People possess non-object categories and information as well [see Spelke, Kinzler, 2007].

[10] Barrett actually discusses a sixth expectation set, *universals*, which "is tacit in essentially all causal reasoning and does not differentiate among the ontological categories" [Barrett, 2011, p. 62].

p. 4–5][11]. For example, perceptual characteristics may cause the mind to identify a certain object as a plant, which activates expectations for spatiality, physicality, and biology. Animacy and mentality *are not* default expectation sets for the plant category and the specific objects associated with it (for a complete description of default category expectations, consult Barrett [2008b; 2011, p. 61–67]; also see Purzycki, Willard [2015, p. 4–7]).

In spite of the mind's initial categorization, some percepts (which include ideas as well as material substances) may display features that defy default expectations of the category with which they have been associated. Objects that defy the mind's default expectations based on category placement are considered "counterintuitive" [Barrett, 2011, p. 68]. Theoretically speaking, three types of counterintuitive objects are possible. One type of counterintuitive object features traits connected with one or more expectation sets besides those recruited by the object's initial categorization. In other words, the object is counterintuitive by way of a *transfer* of traits/expectations from a separate ontological category [ibid.]. "A plant that can talk" illustrates this type of counterintuitive object (in this example, mentality/consciousness characteristics have been transferred from the person domain to the non-animate living things domain). A second type of counterintuitive object involves a *breach* of the default expectation sets normally relevant to the category [ibid.]. "An invisible plant" is an example of this kind of counterintuitive object, since the physicality expectation set has been transgressed. The third kind of counterintuitive object involves both breach and transfer; for example, "a plant that talks and is invisible".

Our discussion of intuitive and counterintuitive ideas has so far traded on the principles of a general object typology and corresponding sets of expectations. Additionally, perceptual characteristics may trigger more specific "schematic" classifications and concomitant expectations. For example, in addition to triggering animal categorization and expectation sets for spatiality, physicality, animacy, and biology (see Barrett [2011, p. 65–67]), an object's perceptual characteristics might also trigger "fish" classification and expectations relating to this kind of animal (e.g., "has fins"). For clarification, general ontological categories/domains subsume a variety of object schema [Purzycki, Willard, 2015]; while the expectation sets associated with each general domain essentially apply to all types of objects within that domain, there are expectations beyond

[11] The belief/expectation sets that are activated by object categorization may also contribute to object categorization. Hence, the categorization of a plant may be due in part to the activation of expectations for spatiality, physicality, and biology, which are constitutive of plants generally [cf. Barrett, 2011, p. 61–67; Purzycki, Willard, 2015, p. 4–7]. In other words, perceptual cues may lead to object categorization by way of triggering specific expectation sets. Nevertheless, categorization begets expectations that may/may not be consistent with the actual object.

these basic ones that apply to certain types of objects within that domain but not necessarily others [ibid.]. The schematic expectations relevant to "fish" may or may not be relevant to other types of animals – not to mention non-animate objects.

Given this complex picture of domains, schema, and concomitant expectations, a few comments are in order. Despite some debate concerning the appropriate number and basic expectations for each of the main object domains, there seems to be greater consensus about these things than the various types of schema and schematic expectations [see Purzycki, Willard, 2015]. While cognitive scientists generally agree that humans share domains and domain expectations, the extent to which humans share specific schema and schematic expectations has received less attention. Finally, though it is conceivable that some objects would defy schematic expectations (e.g., "a rose with hair"), cognitive scientists such as Barrett [2008b] and Purzycki and Willard [2015] have argued that these objects should be considered "counterschematic" rather than "counterintuitive" (which is reserved for domain inconsistencies). CSR has largely focused on intuitive/counterintuitive phenomena; hence, the relevance of schematic/counterschematic phenomena for religious concepts and behaviors requires more attention [Purzycki, Willard, 2015].

Counterintuitiveness, at least, appears to be an important component of certain religious concepts and beliefs. One prominent category to consider in this regard is "god concepts". Although theologians might protest common understanding, there can be little doubt that gods (and similar entities like ghosts, angels, and demons) are popularly depicted as persons – albeit persons with exceptional qualities [Barrett, 1998, 2008]. Like persons, gods are popularly understood as minded agents with the ability to feel and act upon emotion. Nevertheless, gods are considered to possess traits that people do not have, such as immortality, omniscience, the ability to walk through walls, etc. In short, gods are counterintuitive with respect to the person category. Furthermore, counterintuitive characteristics are essential aspects of gods – they are what make gods "gods" and not people.

Beyond its constitutive role, counterintuitiveness can enhance the memorability of gods and other religious ideas [Boyer, Ramble, 2001; Barrett, 2008]. This, in turn, suggests a partial explanation for the spread and durability of religious ideas – the easier something is to remember, the more likely it is to be picked up and sustained [ibid.]. Research indicates that "minimally" counterintuitive objects are better remembered than intuitive or maximally counterintuitive objects [Boyer, Ramble, 2001; Purzycki, Willard, 2015]. A minimally counterintuitive object would be something like "a bird that flies through walls", whereas a maximally counterintuitive object would be something like "a bird that flies through walls, speaks French, cannot be seen, and exists only on Wednesdays". Minimally counterintuitive concepts have one or a few counterintuitive

properties whereas maximally counterintuitive concepts have several. In actuality, God concepts are often associated with several counterintuitive features; hence, one might expect God concepts to have limited potential for distribution. The extensive spread of God concepts that would individually generate multiple associations for people obviously contradicts this expectation, however. One possible explanation for the spread of such concepts would be that people are first introduced to them as minimally counterintuitive ideas (which results in mnemonic coding); then, over time, people collect additional counterintuitive associations with the base concept[12].

Our discussion of counterintuitiveness and religious phenomena has been cast according to a rather tightly defined typology for the categorization of objects. In fact, this way of framing "counterintuitiveness" generally reflects the bulk of the term's usage within CSR. Occasionally, however, some wonder whether "counterintuitiveness" as an explanatory motif might apply to things besides objects, e.g., events or abstract concepts. Barrett takes issue with this notion, arguing that there is little evidence to suggest that such "activate pan-human cognitive systems" [see Barrett, 2008b, p. 313–314]. Additionally, one might argue that "counterintuitiveness" has been so strongly linked with specific object considerations in CSR literature that using it to describe other subjects of investigation would be inconsistent and invite confusion.

While these concerns might mitigate against the specific use of "counterintuitive" for things besides concrete objects (so far as CSR literature is concerned), this feature of objects deemed religious is at least closely related to one of the salient features of events deemed religious. In the latter case one often finds the situation/event violated the attributor's expectations [cf. Sears 2016; Taves 2009]. Similarly, "counterintuitiveness" in the case of objects deemed religious implies the violation of some specific (domain-level) expectation(s).While the expectations involved in the cognition of objects vs. events deemed religious may not be the same, it is reasonable to conclude that "violating expectations" is a generic principle that applies to both. Accordingly, Ann Taves [2009] situates both objects and events likely to be deemed religious under a single category for "anomalous things"[13].

[12] While counter intuitiveness contributes to the spread and durability of god concepts, it is not the sole or essential characteristic of their "success". A key component of the success of certain god concepts is their practical relevance to people in general [Barrett, 2008a]. An invisible, all-powerful agent that operates entirely in another dimension may be considered a "god", but it will be much less interesting and worthy of devotion than an invisible, all-powerful agent that operates in the environment occupied by humans.

[13] "Anomalous things" is one of two categories of "things" that, according to Taves [2009], are likely to be *deemed* religious. The other category is "ideal things". Hence, according to Taves, things deemed religious do not necessarily defy expectations; nonetheless, anomalous things are a major source of religious attribution.

In sum, research from cognitive scientists suggests religious cognition is largely derived from (non-religious) intuitive expectations. Some have therefore claimed that religious ideas are a by-product of basic intuition, which is a natural consequence of development [Boyer, 2001, 2003]. This claim, however, should not be taken to mean that religious thinking is an unnatural or artificial development. Generally speaking, being human in this world inevitably entails having one's expectations violated by imagination and circumstance, resulting in counterintuitive/counterschematic and religious ideas. In short, the human predicament is such that intuitive expectations naturally give rise to religious thought.

Ontological Implications of CSR

While essentially all cognitive scientists agree that religion is a natural phenomenon made possible by general cognitive equipment, they are divided as to whether religion should be understood as nothing but the peculiar affordance of various mental faculties. Although a complete treatment of this issue is not possible here, the closing section of this paper will briefly elaborate on the sides of this issue, given its theoretical importance and practical consequences. Some cognitive scientists, such as Boyer [2001, 2003] and Bering [2011], indeed claim that religious ideas are simply the products of mental tools. God(s), ghosts, and a host of other religious phenomena are mere illusions or fantasies – they have no existence (unlike persons, animals, plants, etc.) apart from the mind.

While some cognitive scientists have unabashedly embraced a naturalistic framework to accommodate the findings of CSR, others are noticeably reticent to do so. The latter insist on a disjunction between the methodological naturalism that cognitive scientists practice in order to initially describe religious phenomena and the theoretical naturalism that might situate these descriptions within an atheistic worldview [cf. Hornbeck and Sears, 2015; Barrett, 2011]. The practice of methodological naturalism results in descriptions of religious phenomena that are limited to empirical categories such as physics, biology, and psychology. Theoretical naturalism, by contrast, is a philosophical understanding of reality that eschews the existence of anything beyond these categories. Cautious researchers recognize the latter is not entailed by the former, even though the latter may be valid and compatible with the findings of CSR. Still, other theoretical orientations may be compatible with empirical/natural descriptions of religion. Clark and Barrett [2011], for example, have argued that the findings of CSR are amenable to a panentheistic theoretical perspective.

Although it is conceivable that religious objects do not exist in fact, this notion raises a philosophical dilemma by implying that mental tools or belief-forming faculties (BFFs) can err [Barrett , Church, 2013]. The

BFFs responsible for religious beliefs are likewise responsible for non-religious beliefs (thus, for example, the BFFs responsible for making one think that a chair has a purpose for which it was designed also seem to be responsible for the idea that the world has a purpose for which it was designed).If the BFFs that inspire putatively false religious beliefs have general rather than specific functions, this naturally leads to concerns about the truthfulness of non-religious beliefs, including the beliefs of atheists and the tenets of CSR [ibid.]. In short, denying the truthfulness of religious beliefs seems to entail thoroughgoing skepticism about beliefs in general, unless there is proof that the conditions causing BFFs to yield religious beliefs are distinct from those causing non-religious belief *and* somehow compromise the reliability of BFFs [cf. Barrett, Church, 2013; Murray, 2009]. As of yet, proof of such conditions is lacking [ibid.]. Given this situation and the potential for radical skepticism if one assumes religious beliefs are false, some cognitive scientists claim it is prudent to begin with the assumption that religious beliefs are generally oriented towards truth [see Barrett , Church, 2013; Barrett, 2011].

In conclusion, though CSR offers many powerful theories regarding the natural emergence of religion, the reality of God, spirits, and other religious phenomena remains a subject for debate.

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