# Religion as a Testing Ground for Cognitive Science

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Research at the intersection of cognitive science and religion can illuminate the cognitive underpinnings of religious thought and behavior, as White (2021) persuasively demonstrates in her comprehensive synthesis of CSR research, but this research can also constrain broader theories of cognition. Here, I examine CSR research relevant to a prominent theory of how we represent minds and bodies: intuitive dualism. This theory, which posits that folk psychology and folk physics are not initially integrated in our representations of intentional agents, makes predictions about god concepts and afterlife beliefs that are not supported by empirical research on these topics. Rather, CSR research suggests that dualism varies by culture and context and must be learned. This case study highlights the reciprocal relation between cognitive science and the study of religion and points to the mutual benefits of their integration.

## Introduction

How do people conceptualize supernatural beings like gods and spirits? Psychologist Claire White (2021), in her lucid and comprehensive review of religious cognition, provides several answers. We may be inherently prepared to conceptualize omniscient agents, since children initially believe that agents have full access to the world around them and must learn that an agent's knowledge and perception are limited (Barrett & Richert, 2003). Alternatively, we may be predisposed to project human properties onto nonhuman entities, leading us to anthropomorphize religious beings even when they are described as having distinctly nonhuman properties, like immortality or invisibility (Guthrie, 1993). Yet another possibility is that we are hard-wired to detect the presence of agents, through cues like faces and contingent motion, and preoccupation with such cues can lead us to see agents beyond those actually present in the environment (Riekki et al., 2013).

These possibilities are not mutually exclusive, and together they explain recurrent properties of supernatural beings and recurrent aspects of how people describe and interact with those beings. One might quibble about how these explanations fit together and whether some are better supported than others, but they well illustrate White's broader thesis that the cognitive science of religion (CSR) differs from other forms of religious study by constructing empirically testable explanations – explanations grounded in prior research on evolution, neuroscience, cognition, and culture. White shows how CSR research has successfully tackled a wide variety of phenomena, from why people believe in an afterlife to why we engage in costly rituals to why our moral commitments are often grounded in religious commitments. But this project could be turned on its head. Rather than ask what cognitive science tells us about religion, we can ask what religion tells us about cognitive science.

Religion is a unique domain for testing cognitive theories because the objects of cognition are not perceptible. When people reason about gods, spirits, souls, the afterlife, and other such concepts, they must rely on cognitive mechanisms that can operate independent of perception and perceptual feedback, including inductive inference, counterfactual reasoning, and imagination. The process of learning about these ideas also draws upon non-perceptual mechanisms, including selective trust, cultural transmission, and semantic memory. Our beliefs about the natural world are grounded in perceptual observation, but our religious beliefs are one step removed, drawing more exclusively on higher-order cognition.

Here, I examine lessons about cognition in general gleaned from the study of religious cognition in particular – namely, lessons about how we conceptualize agents gleaned from the study of how we conceptualize supernatural agents. Our reasoning about ordinary agents, like other people, is typically informed by our perception of their bodies. We can tell where a person is headed by the motion of their limbs, whether they are hot or cold by the complexion of their skin, whether they are relaxed or stressed by the shape of their posture, and what they might be thinking or feeling by the expression on their face. Bodies afford inferences about a person's physical states as well as their mental states. But what inferences can be made in the absence of a body? What assumptions do we make about agents in general?

Supernatural beings provide a unique opportunity for studying agent concepts in the abstract, apart from those evoked by observing an agent's body. Human minds come packaged inside human bodies, but religions around the world posit the possibility of minds existing independent of bodies, in the form of omniscient ancestors, omnipotent gods, invisible spirits, or immortal souls. These beings are explicitly described as lacking bodies, but do we truly conceive

of them as such? Can we reason about mental states without also reasoning about physical states?

One school of thought, known as "intuitive dualism," says yes. Dualism is the belief that minds exist independent of bodies, and intuitive dualism is the stance that we are naturally drawn to this belief. According to psychologist Paul Bloom (2005, 2007), we find dualism intuitive because we have evolved distinct mechanisms for representing the mental states of intentional agents (folk psychology) and the spatiotemporal mechanics of physical objects (folk physics). These mechanisms are innate but not integrated, meaning that infants instinctively view minds as independent of – and separable from – bodies. Only with age and experience do we come to view minds as intrinsically connected to bodies.

Intuitive dualism provides an explanation for why belief in disembodied beings is prevalent within and across religions. Such beliefs are a consequence of folk psychology failing to trigger folk physics, even after the two have been integrated in how we think about human agency. But intuitive dualism is more than just an explanation for belief in disembodied beings; it is a claim about innate cognitive architecture. Consequently, this claim has resonated not only with scholars seeking to explain how we reason about religious concepts like gods (Willard & Norenzayan, 2013), souls (Preston et al., 2013), the afterlife (Bering, 2006), and spirit possession (Cohen & Barrett, 2008), but also with scholars seeking to explain how we reason about ordinary human bodies, including brain functioning (Hook & Farah, 2013), physical health (Forstmann et al., 2012), sexuality (Gray et al., 2011), and conscious experience (Demertzi et al., 2009).

Research on how we reason about beings without bodies – gods, spirits, and souls – thus informs our theories of how we reason about beings *with* bodies. Below, I discuss such research and the lessons it offers on the relation between folk psychology and folk physics. While many adults can conceive of minds as separable from bodies, this capacity requires cultural learning and contextual support, suggesting that dualism is not a byproduct of evolved cognition but rather a counterintuitive construct tied to specific religious traditions (Barlev & Shtulman, 2021).

### Lesson 1: Thoughts about Minds Trigger Thoughts about Bodies

Anthropomorphism is frequently cited as an explanation for how we conceptualize supernatural beings, but anthropomorphism itself requires explanation. Are we predisposed to attribute any human property to nonhuman entities, including bodily properties like eating and breathing? Or just properties unique to humans, like talking and thinking? White notes that the latter

is more common. When Judeo-Christian adults are asked about the properties of God and other religious beings, like angels and demons, they are more likely to attribute psychological (mind-dependent) properties than physiological (body-dependent) ones (Shtulman, 2008; Shtulman & Lindeman, 2016). These findings are consistent with intuitive dualism. In fact, they are part of the motivation for intuitive dualism.

But studies of god concepts reveal several additional findings that are difficult to reconcile with the claim that we inherently parse minds from bodies. For starters, Judeo-Christian adults do not attribute all psychological properties to God and only psychological properties. The particular property matters. Some psychological properties, like sensing warmth and feeling pain, are attributed by few adults, whereas some physiological properties, like living and moving, are attributed by most adults. In a study where participants decided whether God possesses dozens of different properties, American adults attributed more than a third of the physiological properties they were asked about, which suggests they view God as having some kind of body, even if that body is not identical to a human's (Shtulman & Lindeman, 2016).

Property attributions also vary substantially from person to person (Shtulman, 2008; Shtulman & Lindeman, 2016; Shtulman & Rattner, 2018). Some adults attribute many human properties to God and others attribute very few. The latter may conceive of God as a disembodied mind, but these adults also refrain from attributing psychological properties to God, suggesting they conceive of God as something even more abstract than a disembodied mind, like a kind of force or energy. On the other hand, adults who attribute many human properties to God also attribute many human properties to other religious beings, including angels and Satan. They conceive of Heaven and Hell as physical locations in space; they believe that God directly judges human actions and causes human suffering; and they regularly communicate with God through prayer and worship (Shtulman & Rattner, 2018). This collection of beliefs appears to be fully anthropomorphic and thus incompatible with the disembodied notions supported by intuitive dualism.

Research on god concepts is not the only area of CSR research to reveal findings incompatible with intuitive dualism. White summarizes several findings on afterlife beliefs that are also inconsistent. When Judeo-Christian adults are asked about the properties of deceased humans in the afterlife, they claim the deceased retain many of their psychological properties but few of their physiological ones (Bering, 2002). This pattern is consistent with intuitive dualism on its face, but additional studies reveal that the afterlife beliefs of Judeo-Christian adults are unique. People in other cultures, such as the Shuar of Ecuador and the Storozhnitsa of Ukraine, do not reliably distinguish between psychological

and physiological properties when reasoning about the dead. Instead, they claim that all human properties cease with death (Barrett et al., 2021). This pattern is particularly pronounced among children, who also claim that all human properties cease with death (Harris, 2011; Lane et al., 2016). Children raised in cultures that believe in an afterlife will come to endorse this belief, but it must be learned. It does not appear to arise on its own.

Even people who believe in an afterlife tend to view existence in the afterlife as embodied. Depictions of deceased souls in art and literature typically include bodies, and cultural stories involving journeys to the afterlife, such as *The Odyssey* and *The Epic of Gilgamesh*, describe the dead as engaging in normal physical activities (Hodge, 2008).

Another form of embodied reasoning about death, described by White, is reincarnation. This belief is consistent with intuitive dualism on its surface, as it stipulates that personal identity is transferable from one body to another. Yet people who subscribe to reincarnation use physical features, like birthmarks and scars, to infer shared identity across bodies. Indeed, bodily features are viewed as a stronger indication of reincarnation than psychological features, like shared behaviors or shared personalities. Even adults who do not personally believe in reincarnation focus on bodily features when asked to reason about hypothetical cases of reincarnation (White, 2015). Thus, religious ideas predicated on the separability of minds from bodies still activate body-dependent reasoning, which should not occur if folk psychology is inherently disconnected from folk physics.

### Lesson 2: Disentangling Minds from Bodies Requires Cultural Learning

Perhaps the strongest evidence against intuitive dualism is that children do not exhibit this intuition. As noted above, children think a person's psychological properties cease with death just like their physiological properties do, and they must learn to distinguish the two if their culture believes that minds survive the death of the body (Harris, 2011). Likewise, children do not initially distinguish psychological properties from physiological ones when reasoning about supernatural beings. They are as likely to claim that God eats, grows, and stretches as to claim that God thinks, dreams, and talks (Shtulman, 2008). In property-attribution tasks, children attribute more human properties to God than their own parents do (Saide & Richert, 2020; Shtulman, 2008; Richert et al., 2016).

These findings extend to open-ended tasks, like drawings and interviews. When children are asked to draw a picture of God, they typically draw an ordinary man; adolescents, on the other hand, draw something more symbolic, such as a cross or a beam of light (Ladd et al., 1998). When children are asked to describe God in their own words, they typically refer to God as a person or a

man, as in "A person who ruled the whole world once, even the fish" or "A good man who knows everything about the future," and they use gendered pronouns like "he" and "his." In contrast, adolescents and adults use more abstract language, describing God as a "spirit," "presence," or "entity," and they focus less on God's human-like properties and more on God's extraordinary properties, like omniscience and omnipresence (Nye & Carlson, 1984; Shtulman, 2008; Shtulman et al., 2019). The finding that god concepts become more abstract, not less, contradicts the idea that children are predisposed to view supernatural beings as disembodied minds.

Children can learn to adopt such a view, but this process is dependent on the cultural input they receive from other members of their religious community. Some communities endorse more abstract god concepts than others. Islam discourages anthropomorphic descriptions of God and actively prohibits anthropomorphic imagery. As a consequence, Muslim children typically anthropomorphize God less than either Christian children (Richert et al., 2016) or Hindu children (Shtulman et al., 2019). Hinduism, in contrast to Islam, endorses anthropomorphic representations of deities, and Hindu children embrace this input, attributing physiological properties to Hindu gods nearly as often as psychological ones (Shtulman et al., 2019).

This interaction between culture and development is well illustrated by a recent study my colleagues and I conducted in India, on how Hindu and Muslim children conceptualize supernatural beings (Shtulman et al., 2019). Hinduism is the dominant religion in India but Islam is common as well. Children growing up in India are thus exposed to two sets of religious beings: Hindu beings, like Ganesha and Krishna, and Islamic beings, like Muhammad and Allah. The former are described and depicted as having human-like bodies, whereas the latter are described abstractly and depicted infrequently. The juxtaposition of such discrepant representations raises questions about how children conceptualize the two types of beings and whether their religious affiliation, as Hindu or Muslim, influences that conceptualization.

Intuitive dualism predicts that children of both religions should conceptualize both types of beings as disembodied minds. This conceptualization is consistent with the abstract nature of Islamic beings (more or less) but not the embodied nature of Hindu beings, so children's conceptions of Hindu beings should change the most over time, especially Hindu children's conceptions of those beings. In fact, we observed the opposite pattern. Children consistently attributed human properties to Hindu beings, regardless of their age or religion, but they varied in their attributions to Islamic beings. Older children attributed fewer human properties to Islamic beings than younger children, and Muslim children attributed fewer properties than Hindu children.

As an illustration, consider how younger Hindu children conceptualized Ganesha (a Hindu being) and Allah (an Islamic being) relative to older Muslim children. Both groups agreed that Ganesha possesses many human properties, including the ability to eat, grow, jump, and sit, but they disagreed about whether Allah possesses these same properties. Younger Hindu children attributed nearly as many human properties to Allah as to Ganesha, but older Muslim children attributed far fewer to Allah. If they attributed any, they attributed psychological ones, such as the ability to think and talk, rather than physiological ones.

Cultural differences in the conceptualization of religious beings persist across the lifespan. When adults attribute human properties to God, they typically attribute psychological properties, but their willingness to attribute physiological properties varies with how strongly God is anthropomorphized in their culture. For instance, in a study comparing the god concepts of Finnish adults, American adults, and Hindu adults in India, we found that Finnish adults attributed few physiological properties to God (22%), American adults attributed somewhat more (35%), and Hindu adults attributed substantially more (60%; Shtulman & Lindeman, 2016). These cultural differences were further compounded by individual differences within a culture, with some Finnish adults attributing most human properties to God and some Hindu adults attributing very few. Intuitive dualism could account for such differences if cultural input spurred the development of embodied concepts from disembodied ones, but it actually has the opposite effect. Children's earliest god concepts are embodied, and they remain embodied unless their culture discourages (or fails to support) such conceptions.

### Lesson 3: Embodied Notions of Agency Can Be Supplemented but Not Supplanted

The effect of culture on religion is a pervasive theme in White's book. Critically, White emphasizes that culture shapes, rather than creates, the cognitive biases underlying religious ideas. God concepts are no exception. When cultural input leads people to rethink the embodied concepts they developed in childhood, and embrace disembodied concepts instead, their original concepts are not erased. Instead, the disembodied concepts coexist with the embodied ones, creating conflict when reasoning about God's nonhuman properties, such as omniscience and omnipresence (Barrett & Keil, 1996; Barlev et al., 2017).

Some of the earliest evidence for coexisting god concepts came from a study by Barrett and Keil (1996), where they asked Judeo-Christian adults to read stories about God and then recall those stories from memory. Nearly all participants claimed that God is omniscient and omnipresent when asked directly, but

they recalled the stories in ways that implied limitations on what God knows and where God can be. One story, for instance, described God listening to two birds at an airport in the midst of a jet landing. The story made no mention of limitations on God's attention or perception, but participants inserted such limitations in their recall, claiming that the jet "took God's attention away" or that "God could only hear the jet" and "could no longer hear the birds."

These findings suggest that people hold two god concepts: an abstract concept, used when reasoning about God in theological contexts, and an anthropomorphic concept, used when reasoning about God in everyday contexts, like stories. But a problem with this interpretation is that the stories themselves may have triggered participants' anthropomorphic inferences, as these stories described God with a heavy dose of anthropomorphic language, including statements like "God was aware of the girl's deed and was pleased by it" and "God was helping an angel work on a crossword puzzle."

To circumvent this problem, Barlev and colleagues (2017) devised a different method for assessing the coexistence of god concepts: statement verification. In this task, participants are shown a series of statements about God and judge whether each is true or false as quickly as possible. Some statements are consistent with an anthropomorphic concept of God and others are consistent with only an abstract concept, and participants find the latter consistently more difficult to verify. They not only take longer to verify such statements but also make more errors.

As an illustration, consider the statements "God can occupy the space inside a church" and "God can occupy the space inside a boulder." Both are consistent with an abstract, theologically correct concept, but only the first statement is consistent with an anthropomorphic concept; the second statement actively conflicts with such a concept. This conflict should not interfere with participants' reasoning if they hold only one god concept, having replaced the anthropomorphic concept they developed in childhood with an abstract concept developed through religious instruction or experience, but it does interfere. Participants verify statements that violate the core properties of humans (i.e., "God can occupy the space inside a boulder") more slowly and less accurately than statements that accord with those properties (i.e., "God can occupy the space inside a church").

Barlev and colleagues (2017) have documented cognitive conflict between abstract and anthropomorphic concepts of God for a wide variety of statements, including statements about God's knowledge ("God has beliefs that are true" vs. "All beliefs God has are true"), statements about God's perception ("God can hear what I say out loud" vs. "God can hear what I say to myself"), and statements about God's physicality ("God is able be at my church and at

other churches" vs. "God is at all times at my church and at other churches"). They have also documented this conflict in people of varying ages, from teenagers to elderly adults (Barlev et al., 2018), and for religious beings other than God, including Jesus and the Holy Spirit (Barlev et al., 2019).

Such findings indicate that cultural input can foster the development of abstract (disembodied) god concepts but not at the expense of anthropomorphic (embodied) ones. People who explicitly endorse abstract concepts still hold anthropomorphic ones, rooted in our core knowledge of human beings. This finding is not predicted by intuitive dualism, nor is it consistent with intuitive dualism, given that embodied concepts appear to be our default concepts – concepts we can neither revise nor replace. On the other hand, this finding is consistent with what we know about conceptual change more generally. When people acquire a new understanding of a domain, such as when learning a scientific theory or constructing a formal model, the new understanding does not replace their earlier understanding but coexists with it, yielding conflict when we reason about ideas covered by both forms of understanding (Shtulman & Valcarcel, 2012; Shtulman & Young, 2020). Research on coexisting god concepts thus confirms and extends findings from other areas of cognitive science, pursued for different reasons but yielding convergent insights.

## Conclusions

The relationship between cognitive science and religious cognition is a two-way street. Just as cognitive science can provide insights into religion, the study of religion can provide insights into cognitive science. Here, I've discussed how the study of god concepts and afterlife beliefs casts doubt on a popular theory in cognitive science regarding the relation between folk psychology and folk physics, namely, intuitive dualism. This theory predicts that people should uniformly conceive of God as a disembodied mind, yet many people endorse an embodied concept instead. Young children reliably conceptualize God as embodied, and many adults retain this concept across the lifespan, particularly adults in cultures that portray divine beings as having bodies. Even adults who explicitly endorse a disembodied concept of God maintain an embodied concept as well, deploying the latter when reasoning in informal contexts.

With respect to afterlife beliefs, intuitive dualism predicts that people should uniformly believe that minds survive the death of the body. This belief is common among Judeo-Christian adults, but adults from other cultures often claim that psychological properties cease with death just as physiological properties do. Moreover, the intuition that all properties cease with death is common among children, including children raised in Judeo-Christian communities. This collection of findings indicates that thoughts about minds instinctively

trigger thoughts about bodies. We can learn to disentangle the two, but the process must be prompted by cultural input and requires conceptual change (Barlev & Shtulman, 2021).

CSR research has disconfirmed several core predictions of intuitive dualism, but in testing those predictions, CSR researchers have revealed a number of positive findings. First, dualism is a recurrent cultural construct. The idea that minds are separable from bodies may not be innate, baked into our evolved cognitive architecture, but it is an idea that helps make sense of religious claims that seem to contradict everyday observations. The claim that religious beings are watching us and monitoring our social interactions is difficult to reconcile with the fact that we never see these beings. Dualism resolves this tension by granting these beings minds but not bodies, allowing them to see us without us seeing them. Likewise, the claim that dead people have an afterlife is difficult to reconcile with the fact that dead bodies rot and decompose. Dualism resolves this tension by restricting the afterlife to minds, not bodies.

Second, dualism may not be a developmental starting point, but it is a regular developmental achievement. People around the world come to adopt disembodied notions of gods, spirits, and souls. These notions may not replace embodied ones, but their development raises questions about how they are reliably transmitted from one mind to another and from one generation to the next. Belief in disembodied beings may be ubiquitous not because these beliefs are intuitive but because they are *counter*-intuitive. Concepts that violate core intuitions are highly memorable and thus highly transmissible (Boyer & Ramble, 2001; Banerjee et al., 2013). Belief in disembodied beings may be ubiquitous for other reasons as well, including the role they play in socio-political systems (Norenzayan, 2013) and interpersonal relations (Purzycki et al., 2012). The argument that dualism is learned, not innate, raises questions about how this learning occurs and opportunities for testing alternative explanations.

Finally, research on intuitive dualism has revealed compelling interactions between cognition and culture, particularly as they unfold across development. Culture can reshape cognitive biases, as seen in the shift from embodied to disembodied god concepts among Christian children and Muslim children, but cognitive biases continue to influence the role of culturally constructed ideas, as seen in the tension between embodied and disembodied god concepts in adults who explicitly endorse the latter. These kinds of interactions are at the heart of White's masterful synthesis of CSR research. White demonstrates the power of applying the multidisciplinary lens of cognitive science to the study of religion. Perhaps less obvious from White's synthesis is that this project works in reverse as well. The study of religion can – and has – shed new light on cognitive science, as a test of its theories and an expansion of its findings.

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