personal control, including controlling the actions of others (Wegner et al. 2004) and the ability to enact actions at a distance (Pronin et al. 2006).

The feeling of conscious will is an inescapable part of life, and the experience is so compelling it is hard to imagine that it may be just an illusion. Conscious will is not only an essential component to the concept of souls, but the experience can also help explain why souls have their ethereal quality. As Bering points out, belief in souls stems in part from the inability to reconcile how mind arises from body (the *hard problem of consciousness*). Although we have a pretty good understanding of how the heart, lungs, stomach, and other organs function, when trying to comprehend how the brain thinks we are still left scratching our heads. The experience of will presents a particularly tricky question in this puzzle. Agents are seen as first causes, or uncaused causes – the origin and author of action. Discussions of the function of an authorship emotion for physical action point to the need for a controller of action, an internal operator who guides our decisions (e.g., see Wegner 2005). But if the brain is the source of cognition, then how does the thinker direct the thinking in one direction or another? Even if we thought we could pin down the location of the internal operator in the brain, we would still need to explain the controller itself. The popular solution to the search for free will is that the brain is not the ultimate source of thinking, but there is some nonmaterial self – the soul – that somehow operates to control the body.

The pervasive belief in an afterlife is possible because of this mind–body division. And wherever the soul goes, it brings free will with it. Indeed, the experience of free will is often included in the folk understanding of the moment of death: Death occurs when one is ready to die, loses the will to live, or chooses to go into the light. Bering suggests that belief in an afterlife results in part because we don't know what it is like to be dead. We may also be unable to fathom the absence of will. It is difficult to imagine that such a potent force could just dissolve into nothingness. After all its majesty and magic, surely conscious will cannot be just snuffed out of existence, at least not without its permission. James Brown, move over: Conscious will is the Godfather of soul.

No evidence of a specific adaptation

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Abstract: Bering's findings about the mental representation of dead agents are important, although his opposition between "endemic" and "cultural" concepts is misleading. Endemic and cultural are overlapping, not exclusive categories. It is also difficult to see why reasoning about the dead would require a specific cognitive mechanism. Bering presents no clear evidence for the claim that the postulated mechanism is an adaptation.

Bering argues that his theoretical framework is in some respect more plausible than the "standard model" (Boyer 2005) in the cognitive science of religion (e.g., Bering 2002a; 2003a). He claims that the "cultural epidemiologists" regard religious concepts as entirely explicit in nature and as "socially acquired" or being "generated by culture" (Bering 2002a, p. 293). Bering (2002a; 2003a), however, thinks that ghost concepts are "endemic" or "innate," not something learned from others. The "central thesis" of the target article is that an organized cognitive system, dedicated to form illusory representations of psychological immortality and symbolic meaning, evolved in response to the unique selective pressures of the human social environment.

Bering raises an important question about religion and adaptation, although his nativist claim is somewhat problematic. He argues that *specific* afterlife beliefs are *not* "direct products" of natural selection; what has been selected for is "an intuitive pattern of reasoning" that does not hinge on the presence of explicit religious concepts. Bering thus makes a distinction between explicit religious concepts learned from culture and innate patterns of reasoning. He has previously argued that "the very concept [of a ghost] itself, has natural foundations in the human mind," asking whether it might be possible that "the general idea of an afterlife is not so much implanted in people's heads by way of 'exposure' to counterintuitive tales, as it is *already present*" in human cognitive structures (Bering 2002a, p. 269).

This line of reasoning is also present in the target article. Bering argues that Boyer (2001), Pyysiäinen (2001), Atran (2002), and Sperber and Hirschfeld (2004) approach religion as a (fuzzy) set of ideas that survive in cultural transmission because they effectively parasitize evolved cognitive structures. These "epidemiologists" are not interested in how "a representational bias for envisioning personal immortality" has "impacted the net genetic fitness of individual humans in ancestral environments."

There is, however, a conceptual confusion involved in Bering's way of distinguishing his approach from the standard model. Barrett (2003), Boyer (2003a), and myself (Pyysiäinen 2003) pointed out three years ago that Bering's dichotomy between endemic and cultural concepts is misconceived; epidemiologists do not regard culture as a set of "entirely explicit" concepts that are simply learned, irrespective of implicit biases. Concepts cannot be divided into two mutually exclusive classes: those we are born with and those we learn from others. There are only concepts represented in mind; some of them are communicated to others and thus may become widespread. A representation is cultural to the extent that it is represented by many persons and is preserved in various versions over time, no matter what its origins are.

According to Barrett (2003), nativists such as Bering focus on how the cognitive machinery of individuals "produces" intuitive ideas and behaviors that may then receive augmentation from explicit ideas learned from culture. The epidemiologists, in turn, are not necessarily interested in the origins of concepts and beliefs; instead, they try to explain the distribution of representations in populations. Widespread ideas are typically such that they are easily adopted because it is possible to enrich them by one's intuitions. Thus, there need not be a contradiction between nativism and epidemiology.

The actual difference between Bering and the standard model is in that Bering presupposes a pattern of reasoning dedicated *specifically* to making inferences about afterlife. Whereas Boyer thinks that beliefs about dead agents are mediated by psychological adaptations that enable us to reason about agents in general, Bering holds that reasoning about dead agents is based on a task-specific adaptation (Boyer & Barrett 2005; cf. Stone & Gerrans 2006).

By the same token, Bering is committed to an adaptationist view of religion, whereas in the standard model religion is an evolutionary by-product (see Atran 2002; Bulbulia 2004). All ideas of counterintuitive agents, such as ghosts, gods, and ancestors are represented using the normal mechanisms of agent representation, adding one minor modification or "tweak" to an intuitive representation (Boyer 2003b). No specific mechanisms are needed to mediate different types of agent representations.

Surprisingly, Bering also suggests that interactions with imagined dead agents might be cases of "off-line" social cognition in the sense that the dead are represented as absent but existing persons. This, however, implies that there is no *specific* mechanism for reasoning about dead agents. The specificity of the "intuitive pattern" has to be only in its domain of application, not in the mechanism itself.

If this is so, then we also have to look for adaptations in agent detection and theory of mind in general, not in special concepts

https://doi.org/10.1017/S0140525X06459100 Published online by Cambridge University Press

of dead agents. The weakest part of Bering's contribution is precisely his evolutionary speculations. It is not much of an argument to say that supernatural illusions *may* have had fitness-enhancing effects, and that if this is so, then they *might* represent a specific cognitive adaptation (see Sterelny 2003). Bering hints at the problem of the evolution of cooperation but does not really explore it (see Axelrod 1990; Nowak & Sigmund 1994; 2005; Nowak et al. 2004; Richerson & Boyd 2005). Saying that the ability to entertain ideas about supernatural agents "might have led" our ancestors to accept the moral norms of their community raises more questions than it solves (see Boyer 2004; MacIntyre 2004; Pyysiäinen 2006). As I see it, Bering's ingenious experimental work is best interpreted within the standard model. Developing evolutionary arguments about morality and cooperation would require a more rigorous methodology.

An unconstrained mind: Explaining belief in the afterlife

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Abstract: Bering contends that belief in the afterlife is explained by the simulation constraint hypothesis: the claim that we cannot imagine what it is like to be dead. This explanation suffers from some difficulties. First, it implies the existence of a corresponding belief in the "beforelife." Second, a simpler explanation will suffice. Rather than appeal to constraints on our thoughts about death, we suggest that belief in the afterlife can be better explained by the lack of such constraints.

Why do so many people believe in life after death? According to Bering's simulation constraint hypothesis, the common-sense belief in the afterlife originates in part from the difficulty of mentally simulating a scenario in which one does not exist. Such an act of simulation is difficult because it invites one to imagine what it would be like (in the technical sense of "what it is like," from Nagel 1974) not to exist – an impossible feat. Because one cannot imagine what it would be like to be dead by imagining what it would be like not to exist, one imagines instead what it would be like to exist apart from one's body. This leads to the belief in psychological persistence after physical death.

If the simulation constraint hypothesis is correct, then, we believe in life after death because we cannot imagine ceasing to exist after death. But it is no easier to imagine one's nonexistence after death than it is to imagine one's nonexistence before the start of bodily life (say, before conception). What the simulation constraint hypothesis predicts, then, is belief in a stronger form of psychological immortality than the one Bering considers, namely, belief in the afterlife coupled with belief in the "beforelife." The question is: Do these two beliefs have equal currency?

This is an empirical question, and answering it will require careful experimental investigation, using methods similar to those described in the target article. This investigation is ongoing (Bering, personal communication). But there is reason to suspect that the answer to the question is no. There appears to be a far greater prevalence of belief in the persistence of the soul after bodily death relative to belief in the preexistence of the soul before bodily life.

In historical and contemporary Christianity, for example, the dominant views of the soul are creationism and traducianism. According to these views, the soul originates at the moment of conception, either by a creative act of God (as in creationism) or by generation from the souls of one's parents (as in traducianism). Thus, both creationists and traducianists deny that the soul exists prior to conception. Though some Christian sects, such as Mormonism, insist on the preexistence of the soul relative to conception, this is very much a minority view in Christian theology, both past and present. The same is true of Judaism and Islam. By contrast, belief in the continuing existence of the soul after death is shared by most major world religions, including Christianity, Judaism, and Islam. While this discrepancy might be explained in other ways, it suggests that belief in the afterlife and belief in the beforelife are not equally at home in common sense. If that turns out to be true, the simulation constraint hypothesis is in trouble.

Fortunately, we can explain the common-sense belief in life after death just as well without appealing to the idea of constraints on simulation. Instead, we can appeal to the relative absence of such constraints. In the target article, Bering himself gestures towards the explanation we have in mind: "[T]he nature of the body's role in producing the subjective experiences of emotions, desires, and beliefs seems not as amenable to children's scientific theories of dead minds (or, indeed, even to adults' formulation of scientific theories regarding phenomenal consciousness and the brain, e.g., *qualia*)" (sect. 2.1, para. 6).

Here's how the story goes in a bit more detail. Children and adults alike tend to think of the mind in general – and phenomenal consciousness in particular – in terms that are sharply distinct from, and even cognitively opposed to, the terms in which they think of physical-causal mechanisms such as the brain and other parts of the body (Robbins & Jack 2006; see also Bloom 2004). Those links between the mental and physical that we do understand to exist are few and far between, and they apply only to a limited range of mental states (Bering & Bjorklund 2004). Hence, our thoughts about the physical do little to constrain our thoughts about the mental.

In particular, the thought that our body will give out at some point in the future does not lead us to think that our mind will do the same. Indeed, our cognitive architecture may dispose us to reach the opposite conclusion. The very fact that the mental and the physical seem so starkly different may lead us to believe in mind–body dualism. It's a short step from belief in dualism to the belief that at least some psychological states, such as conscious thoughts and feelings (which seem terminally resistant to causal-mechanical explanation; see Robbins & Jack 2006), will persist after death.

Evolution's lost souls

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Abstract: The target article speaks loudest about what it cannot see – that man exists in God. Its claim that supernatural beliefs are "evolved errors" rests on unwarranted assumption and mistaken argument. Implications for evolutionary study are considered.

Either man is the child of God, or he is not. If he is divine, he is soulful and immortal, he transcends nature (is supernatural) and transcends psychology. If he is not divine, he is soulless and mortal, he is part of nature and his beliefs about soul and afterlife are errors and illusions of folk psychology.

The target article is clear about the facts. Infants are common-sense dualists who do not see people in the same way they see material objects. Children hold natural beliefs in an afterlife. Children reason better about the omniscient mind of God than about the limited minds of people and animals. Undergraduates

https://doi.org/10.1017/S0140525X06459100 Published online by Cambridge University Press