are spooked into moral behavior by the suggestion of supernatural presence. And, generally, people are "intuitive theists" who find teleology in the natural world and who find intelligent design in their personal lives.

The target article is clear also about the question raised by the facts:

> [I]f God does not exist, then the unique self (i.e., the individual "soul" of any given person) cannot be the product of intelligent design; rather, it is simply the end product of standard machinations of genetic and environmental recombination. [. . .] The task remains for cognitive scientists to determine why the teleological position is so frequently adopted, and prospers so vehemently, over the mechanistic alternative. The human mind cannot seem to easily accommodate itself to a godless, evolutionary canon when it comes to the self's existence. (target article, sect. 3)

And the target article is clear about its reckoning of this question. Human thinking suffers three evolved errors: *Type I errors* in reasoning about the afterlife, *teleo-functional errors* leading to belief in the soul's intelligent design, and *theory of mind errors* leading to belief in supernatural causes. These errors culminate in an illusion that the self is related to a supernatural creator and has a moral obligation to that creator. And these evolved errors and illusions explain why the "teleological position" prospers and thereby why the folk psychology of souls takes the form it does.

Although clear, the target article presumes everything by its question. On the premises that God does *not* exist and the soul is *not* an intelligent design, the article asks how evolution produced appearances to the contrary. These premises are not statements of scientific fact, but are statements of secular faith. Why these premises? What is the evidence and argument for them? And what is the cost in accepting them? More to the point, what if God *does* exist and the soul *is* an intelligent design? How dramatically the question changes – from being about error and illusion to being about Natural Law, from being about how people prosper in spite of themselves to being about how they prosper in the light and love of God. What the target article describes as the naïve misapprehension of the child becomes the wisdom of the child.

From its unjustified premises, the target article comes to a false conclusion. Evolutionary science cannot explain why man thinks what he does. Evolutionary science is about matter, not about meaning. It explains the origin, proliferation, and disappearance of material forms (e.g., physical traits, abilities, dispositions), but not of mental forms (e.g., ideas, beliefs, feelings) (see Atran 2002). The latter are not material survivals, but are immaterial creations. This is plain in the article's own ideas about the "errors" of religious thinking. Are these ideas also evolved? And if so, how are they selected alongside the ideas they rule out? Furthermore, evolutionary science is about natural objects, not about man. It misunderstands man when it traces his every feature, including those that are unique, to his physical being (e.g., if man is the only animal that can think creatively using symbols, it is because he has an enlarged brain with a prominent cerebrum). By confining man to his physical capacities, evolutionary science fails to account for his unique and creative use of these capacities. It leaves to question why he uses his capacities as he does and why animals that share many of these capacities (e.g., the chimpanzee) do not use them the same way. Why does man reason? Why does man make art? Why does man seek life in God? In a word, evolutionary science fails to explain man *qua* man.

This, finally and ironically, is the loud unspoken message of the article:

> [J]ust as we can close our eyes to prevent light from being converted into neural signals, science may provide a minority (i.e., nonbelievers) with the armamentarium to close their eyes to the supernatural. (sect. 3, para. 9)

To see man with eyes open – to see him as he is – is to conceive him differently. It is to see him, not in the blinkered metaphysic of evolutionary science, but in the revealing metaphysic of Divine creation (Sandelands 2005). It is to see him, not as an object of the natural world, but as a creative being in God. It is to see him as a supernatural being, a genuine soul. Only when seen in this second way – a way well-described by the world's great faiths – can satisfactory answers be found to the main questions about his life: What is a person? What is society? What is freedom? What does man want? And, what is the good? A full and true study of man must begin in God.

Reasoning about dead agents: A cross-cultural perspective

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Abstract: Jesse Bering's theory of the "folk psychology of souls" is brilliantly elucidated and warrants further empirical investigation. While additional experimental research is certainly required, we also need to interrogate the evidence on reasoning about dead agents in a wide range of real-world settings.

Bering's "folk psychology of souls" comprises six main hypotheses that warrant further investigation in light of evidence from comparative ethnography.

The *Simulation Constraint Hypothesis* proposes that an inclination to attribute consciousness to the dead arises from an inability to simulate the absence of consciousness (whereas we have less difficulty simulating the absence of perceptual capacities such as seeing and hearing). Although this hypothesis may be correct, it is not obviously so. Loss of consciousness (e.g., when sleeping) is a routine feature of human experience and apparently quite easy to conceptualize, if not to simulate. It is noteworthy that adults, in our own society at least, sometimes imagine that children will be comforted by the idea that grandma is sleeping rather than dead, not because an absence of consciousness is hard to convey (quite the opposite), but because a *permanent* absence of consciousness is *alarming*. Further, an inclination to attribute consciousness to the dead would, in itself, be inconsequential in behavioural (and thus evolutionary) terms. Dead agents must additionally be attributed capacities that enable them to intervene in human affairs: at least minimally, they must not only be conscious but also have access to socially strategic information (e.g., being able to hear and see what mortals are saying and doing). The ethnographic record furnishes abundant examples of representations of dead agents whose perceptual capacities are preserved along with conscious beliefs and desires, whereas representations of dead agents as deaf or blind are rare or nonexistent. Thus, even if the simulation constraint hypothesis proves to be correct, its impact on behaviour must in turn depend on the activation of additional cognitive tools (e.g., as proposed in Barrett 2004 and Boyer 2001).

The *Mental Continuity Hypothesis* proposes that attributions of emotions, desires, and epistemic states to dead agents ("mental continuity judgements") result from universal cognitive biases emerging early in childhood. This hypothesis seems to be supported by evidence that among American children such attributions decrease with age, "the opposite pattern that one would expect to find if the origins of such beliefs could be traced exclusively to cultural indoctrination" (target article, sect. 2, para. 3). If this finding proves to be robust then, to rule out "cultural indoctrination" and other effects of variable environments, we would need to test the hypothesis across a range of cultural settings

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(a valuable start has been made by Harris & Giménez 2005 and Astuti, forthcoming a).

The *Absent Presence Hypothesis* proposes that our habit of thinking about significant others *in absentia* reinforces the illusion that they are still around after they have died. Such reinforcement may vary cross-culturally, however. In modern complex societies, close kin often live far apart, relying heavily on disembodied forms of communication to maintain contact. Bering's example of bereaved persons abortively telephoning their loved ones may best be understood in that context. In small-scale societies, including those in which our ancestors evolved, physical separation from significant others is/was more limited in duration and the reality of their absence after death perhaps less easy (momentarily) to forget. This is a potentially testable hypothesis. Are accidental communication attempts with the dead less frequent in small, face-to-face societies with low rates of out-migration than in modern urban settings?

The *Good Citizen Hypothesis* proposes that the presumed presence of supernatural agents encourages prosocial behaviour and inhibits antisocial behaviour. The idea that supernatural agents reward good behaviour and punish the wicked is a recurrent theme in the so-called ethical religions, but generalizes only with considerable difficulty. In many Melanesian societies, for instance, the ancestors are thought to incite homicidal behaviour by systematically undermining more natural tendencies towards peaceful cooperation and prosociality (Harrison 1993). A broader question might be whether prosocial behaviour enhances reproductive success in human populations, past and present, as Bering's evolutionary scheme proposes. In many societies, the cultivation of a reputation for acquisitive and aggressive behaviour, at least among males, appears to be an effective strategy in accessing resources (including women).

The *Purposeful Life Hypothesis* proposes that people are cognitively predisposed to think that they were called into existence to serve a divine plan. This hypothesis, and the related contention that suicide is an affront to God's scheme, may prove difficult to generalize cross-culturally, perhaps reflecting attitudes found mainly in highly individualistic cultural traditions of modern origin.

The *Meaningful World Hypothesis* proposes that people are cognitively predisposed to interpret happenings as communicatively driven. A readiness to interpret unusual occurrences as signs or portents initiated by supernatural agents, rather than as merely random and meaningless events, has been widely reported by ethnographers. It is not clear why such a predisposition should be adaptive, although it could be a spandrel, a product of sign-reading capacities that evolved as an aid to tracking quarry, detecting predators, and grasping the communicative intentions of other humans (among other useful applications).

From an anthropological viewpoint, Bering's arguments are highly significant and warrant careful attention in future cross-cultural research.

Author's Response

The cognitive science of souls: Clarifications and extensions of the evolutionary model

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Abstract: The commentaries are a promising sign that a research programme on the cognitive science of souls will continue to move toward empirical and theoretical rigor. Most of the commentators agree that beliefs in personal immortality, in the intelligent design of souls, and in the symbolic meaning of natural events can provide new insight into human social evolution. In this response I clarify and extend the evolutionary model, further emphasizing the adaptiveness of the cognitive system that underlies these beliefs.

R1. Introduction

Only in the past few years has the cognitive substratum of religious and supernatural experience been penetrated by the precision tools of experimental science (for reviews, see Atran & Norenzayan 2004; Barrett 2000; Boyer 2001; Whitehouse 2004). Shaky hands are to be expected in these first attempts at scientific exploration, and some trembling is also evident at places in the target article. But, as **Bainbridge** so eloquently discusses in his commentary, picking up these tools to begin with is the hard part, and I am very grateful to the commentators for offering their expert hands to steady my own.

Since the focus of most of the commentaries concerned the evolutionary model and because this issue is central to the theoretical framing of the target article, most of my response will be devoted to that topic, highlighting theoretical points in the other commentaries whenever they have some bearing on the evolutionary history of a folk psychology of souls.

R2. Clarifying the evolutionary model

By far the most frequent criticism in the commentaries questioned my evolutionary model, seeking greater clarity and further attention to deviant cross-cultural examples of religious belief systems that seemingly violate the model's core assumptions. For example, **Johnson & Nyhof** protest that "the Darwinian mechanisms are left completely unspecified." **Pyysiäinen** finds similar fault with the target article's evolutionary cast ("The weakest part of Bering's contribution is precisely his evolutionary speculations"), a concern echoed in the vituperative commentary by **Hegdé & Johnson**, among others. According to the majority of commentators who addressed the evolutionary issues, the explanatory framework into which I have placed my research programme is flawed on several counts.

To recount the original argument, I claimed that three basic cognitive mechanisms – those that produce illusions of personal immortality, of teleological authorship in the design of individual souls, and of natural events as having symbolic meaning – formed an organized "system" at some point in recent human evolution as a result of the unique selective pressures operating in our social environment. I placed the word "system" in scare quotes because I see these illusions as being connected through a sort of abstract, conjunctive tissue that biases reasoning about personal existence, not as a modular, task-specific system yielding static behaviours independent of cultural variation (**Livingston; Pyysiäinen**). I have never claimed that "religion is innate" (**Bloch**) or even that there exists "an evolved system dedicated to

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