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The Use of Supernatural Entities in Moral Conversations as a Cultural–Psychological Attractor

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Social behavior in most human societies is characterized by the following of moral rules explicitly justified by religious belief systems. These systems constitute the diverse domain of human sacred values. Supernatural entities as founders or warranty of moral principles may be seen as a form of “conversation stoppers,” considerations that can be dropped into a moral decision process in order to prevent endlessly reconsidering and endlessly asking for further justification. In this article we offer a general naturalistic framework toward answering the question of why supernatural entities are so attractive in moral argumentation. We present an explanatory model based on the phenomena of multiple channels of moral reasoning, the suspension of epistemic vigilance, and relevance assumptions through the attractiveness of the sacred, moral dumbfounding, and the expression of social coalitionary commitment. Thus, in light of much of current cognitive theory, sacred values make sense as basins in the evolutionary landscape of human morality.

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Key words: cognitive science of religion; moral argumentation; relevance; sacred values; supernatural entities

Introduction

Religion in its broadest characterization can be described, not only in an etymological sense, as a more or less institutionalized binding to trusted supernatural entities. In most cultures, both historically and geographically, supernatural entities have been linked with moral designs and moral discourse.

The universal prevalence of representations of supernatural entities with concern for the life of people has been recently related to the human innate disposition to detect agency in a way that is, possibly for evolutionary reasons, more sensitive to false negatives than to false positives. In this way supernatural enti-

ties systematically trigger cognitive capacities of human universal psychology, such as the agency detection device⁸ that is a central part of much research in social cognition today. Furthermore, young children can reason as spontaneous theists, attributing intentional reasons to natural phenomena.⁹ It has also been proposed that supernatural entities survive culturally in competition with other cultural creations—and in such a way that they are to be found cross-culturally—precisely because they fit so well with the human mind. Instead of *Homo sapiens* having a “God module” in its brain in the form of a biological adaptation to religion, it has been advanced as a more economical hypothesis that representations of supernatural religious entities trigger the normal psychology of our species. Nevertheless this happens in a way that makes these representations particularly salient and ubiquitous.¹⁰

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Representations of the supernatural rely on human natural dispositions of multiple cognitive domains (e.g., domain of naive biology, domain of folk psychology, domain of theory of mind). They mobilize these various cognitive systems and simultaneously produce striking violations of their regularities.⁷ For instance, expectations of folk physics are broken by bodiless ghosts that walk through walls; expectations of folk biology are broken by ancestors that remain immortal. These features of the supernatural co-occur at the same time with a belief-desire psychology proper to our mental dispositions (as in, for instance, inanimate objects, such as talismans, that have desires and intentions). In this respect supernatural entities may constitute superstimuli for our psyche.⁵ They strongly stimulate our mental dispositions and naturally signal relevance and memorability to our cognitive systems. Where the optimum points and boundaries are for supernatural beliefs with respect to normal expectations for an oral tradition to survive in the cultural time are currently being investigated. A moderate introduction of supernatural characteristics that break the regularities of folk cognitive systems appears as the optimum, while too much deviation from natural expectations constitutes a handicap in the cultural struggle for “memorability.”¹¹

In addition, religious supernatural entities are almost universally linked with moral statements by approving them and enforcing them in explicit codes or in conversation within the social group in question. Supernatural entities are the most important guarantor of human sacred values, another universal feature of human culture that defies simple utility maximization schema of purely economic actors. This emphasizes the need for a more detailed study of the psychology of what humans take as sacred.

In this article we provide a general framework, with the aid of recent research in cognitive science and current naturalistic approaches of religion, that addresses the almost universal prevalence and attractiveness of supernatural entities in moral discourse. Supernatural entities as founders or warrants of moral princi-

ples, we contend, may be seen as a form of “conversation stoppers,”¹ considerations that can be dropped into a moral decision process in order to prevent endlessly reconsidering and endlessly asking for further justification (see also Refs. 2, 3). We present an explanatory model based on the phenomena of multiple channels of moral reasoning,⁴ the suspension of epistemic vigilance, and relevance assumptions through the symbology of the sacred,^{5,12} moral dumbfounding,⁶ and the expression of social coalitionary commitment.⁷ Our theoretical proposition is that in the light of much of current cognitive theory, sacred values make sense as basins in the evolutionary landscape of human morality.

The Emotional Anchoring of Supernatural Morality

Moral reasoning has been traditionally studied in relation to explicit discourse on moral dilemmas. In a different tradition that goes back to the philosopher David Hume, moral judgment has been intensely researched in recent years under the idea of the primacy of affects and emotions. The growing evidence of an emotional highway to moral cognition¹³ is consistent with the idea that humans are endowed with roughly two different systems of moral cognition: on the one hand, a fast and frugal channel by which we reach rapid judgments and, on the other hand, a slow and more reflective one that allows the revision or strengthening of our intuitions.¹⁴ Automatic emotional reactions that are triggered in milliseconds are an occurrence of this first system of cognition. In the form of embodied appraisals,¹⁵ they may instantiate a type of rapid moral judgment and classification that may often precede the act of reasoning in our moral experience (see Huebner *et al.*¹⁶ for some skeptical points on the exact role of emotions in moral judgment). Research in cognitive neuroscience is advancing a cartography of how brain centers process emotional responses while playing a key role in the

eliciting of adaptive responses to the environment. In one well-known study, Joshua Greene and collaborators¹⁷ showed how certain parts of the brain are activated more (as observed in a functional MRI scan) when subjects were pressed to decide a personal dilemma (such as pushing a very overweight person from a footbridge to save five others from a trolley with a driver who had fainted) as opposed to a more impersonal calculated dilemma. Where more calculated decisions were reached (such as pressing a lever to deviate the trolley so that it would kill one person but save five), areas associated with working memory, such as dorsolateral regions of the frontal lobes, predominated. Where less calculated decisions were reached, areas corresponding to the most emotional parts of the brain, such as medial frontal gyrus, posterior cingulate gyrus, and bilateral STS, were more activated.

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Could representations of the supernatural play a role in imprinting regions of the moral brain in a similar way? This could be, in fact, one of the sources of the emotional valences of moral claims related to respect of the gods, religious purity of some actions, as well as other sacred values. We focus on three broad categories of emotions here and how they interact with the concept of the supernatural: outrage, disgust, and fear. Positive emotions, such as elevation, purity, love, or attachment, could have been mentioned as well. No doubt a variety of emotional relations can be established with supernatural figures in very diverse human cultural contexts, covering a wide range of behavioral dispositions. These deserve further study and consideration in any comprehensive study on the matter, although there may be reasons why, other things being equal, negative emotions do have a greater impact in our psychology than positive ones.¹⁸

Outrage

Philip Tetlock and collaborators¹⁹ have studied the eliciting of moralistic outrage as individ-

uals mingle in public displays of infringement of sacred values. When presented with the possibility of trading sacred values with more secular values (usually money), subjects react with outrage, an outrage that usually only increases if the economic offer is augmented.²⁰ Thus, taboos and sacred values form a basis for a nonutilitarian pattern of behaviors, and this is achieved in an important way through the emotion of outrage.

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Disgust

The feeling of purity and impurity in relation to divinity may be a very natural and spontaneous human cultural response, and it has been researched by cognitive psychologists in cross-cultural contexts. Disgust has been proposed as an emotion that is tied in a specific fashion to the realm of divinity. Such is the case, for instance, in Rozin's²¹ CAD model of moralistic emotions, which links the emotions of contempt, anger, and disgust to anthropologist Alan Fiske's²² tripartite model of moral domains (e.g., community, autonomy, and divinity). In order to prove the strength of this correlation between emotions and domains, Rozin *et al.*²¹ showed 27 situations that represented violations of three sorts of moral situations: moral conflict related to rights (autonomy), moral conflict related to membership of a group (community), and moral conflict related to divinity and impurity (divinity). Participants were asked to match the violations to the emotional concepts of contempt, anger, or disgust. Participants were also asked to match the given violations to photographs of people expressing the above emotions. And in yet another variant, participants were requested to facially express how they felt about the violation in question. The findings of their cross-cultural study showed that violations concerning the group mostly elicited contempt, whereas violations concerning personal rights elicited anger. Disgust was the most triggered emotion for violations relating to their constructed category of divinity and impurity.

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Fear

Considering the presence of an agent that watches you may interfere in the decision process leading to action or inhibiting it. In Pascal Boyer's terms "full access strategic agents" are something that may be kept in mind while confronting certain moral dilemmas. In particular such an agent could elicit some degree of fear. Psychologists Jesse Bering and Dominic Johnson²³ studied this possibility in an experiment with children who were told not to look into a "forbidden box" and then left alone in the room.²⁴ In one condition, children were told that the fairy Alice could be there and watch them. It was shown that the group of subjects who thought Alice might be present cheated significantly less. Similar results were obtained with undergraduate students as subjects in a study in which they played a competitive computer task and in one condition were told that the ghost of a defunct experimenter may still haunt the room. That group of subjects cheated less on the computer task as opposed to subjects under control conditions.

Could such emotions be part of the explanation of why supernatural entities play a role in anchoring moral discourse in such a prevalent fashion among cultures? We think so. One possibility is that supernatural entities are one special source of discursive justification. On the emotional domain this relates to the phenomenon of "moral dumbfounding,"⁶ the *post hoc* rationalization of moral judgments that are expressed primarily because of their emotional valence and not by explicit argumentation. The phenomenon was investigated by Jonathan Haidt who studied subjects in a discursive situation in which they could not successfully defend their moral conclusion and ended up saying things like "I just know it's wrong, it's disgusting." In one of these experiments the experimenter reformulated moral dilemmas in such a way that subjects were progressively in pain to justify their judgment. (These included cases such as brother-sister incest or eating the family dog but elaborately framed by the experi-

menter such that the explicit details of the case turned them into extreme cases of crime without victim). Dilemmas were also presented in cases so that there was no easy supernatural justification; for instance when subjects alluded, after painful efforts, to the fact that the behavior was proscribed in the Bible, the experimenter presented a counterexample of the above-given behavior as recommended by God in the Bible. Thus, most subjects ended up saying things like "I don't know, it's just disgusting." Similar results were produced when Wheatley and Haidt⁶ submitted subjects to hypnosis so that they would feel disgust when hearing some neutral word, such as *take* or *often*. Then they were presented with examples of sentences involving such words and were told something apparently value free and insubstantial about them. Most subjects, as opposed to controls (who had not been hypnotized), judged the behavior as wrong and were obviously in trouble when they had to provide a justification; but they still were able to rationalize their choice.

The fact that the above-mentioned schema of emotional moral judgment and justification could easily be generalized in many occasions on our moral views may suggest that the use of supernatural agents in moral conversation is a cost-effective way to find convincing *post hoc* rationalization. In other words, if one is to make sense of his emotional reactions, a good conversational strategy (obviously among many) could be to refer to supernatural entities and supernatural authority, such as when Haidt's subjects referred to biblical authority. After all, as put by philosopher Daniel Dennett, moral discourse needs some conversation stoppers¹ on which to stop the endless consideration of advantage and value. This could be especially effective if there is some correlated emotional counterpart to the act of framing the justification in supernatural terms. We follow other philosophers here² but also neuroscientists²⁵ emphasizing that moral reasoning at the individual or social level may be, by itself, a dangerous avenue to pursue if there are no solid grounds, emotional or other, on which to anchor moral conclusions. The

balanced consideration of all advantageous possibilities can lead to depletion of time resources in decision making as well as increase the temptation to defect. Thus, conversation stoppers can introduce anchors to decide while facing more seemingly utilitarian temptations. Thus, as in Greene's functional MRI examples, nonutilitarian reactions may result from the victory of an emotional reaction over a cost-benefit analysis.

Such emotional reaction could have its origin in the representation of some sacred values based on supernatural entities. In fact, psychologist Philip Tetlock has defined sacred values precisely as those that individuals in a moral community accept as conveying transcendental value to a thing so that they explicitly deny comparisons, trade-offs, or forms of contamination with commercial values.²⁶ Thinking of one's action in supernatural-religious terms (e.g., "that is forbidden by the gods," "that is impure") eliminates certain practical impossibilities from the space of deliberative reasoning² in a way that thinking "I just don't like X" does not. Philip Tetlock has thus worked on the phenomenon of "heretical counterfactuals," boundaries to counterfactual considerations that constitute the domain of the "unthinkable" or possibilities of action, the mere suggestion of which induces some display of disgust and subsequent need of moral cleansing. Such sacred values may act as conversation stoppers both at the level of individual reasoning and in explicit moral discourse in social interaction. In Dennett's words: "*We can recognize the appeal of... some unquestioning dogmatism that will render agents impervious to the subtle invasion of hyper-rationality*"¹ (p. 508). After all, if you are found calculating, for instance, the opportunity costs of acting like a good parent or spouse, you have probably not understood what it is morally about and you will probably incur some form of social sanction.

Q13 The whole suggests that decision-making psychology must include the dimension of "devoted actors" acting as "intuitive theologians" as much as it has included the dimension of the

classical rational actor acting like an "intuitive economist."

If moral discourse on sacred values is effectively endowed with such an emotional balancing of power in reasoning and conversation through the use of supernatural entities, we can further question what other proximate and ultimate factors may be causally efficacious on this. This is addressed in the next sections.

Relevance and Authority

Through which mechanisms do we come to ascribe such emotional valence to moral statements based on supernatural entities so as to make them effective as conversation stoppers? Part of the explanation has to do with the fact that they are interpreted in a special way. Many rules of the usual pragmatics of conversation are bracketed while uttering and interpreting statements of the supernatural.

Relevance theory²⁷ is a theory of pragmatics that posit that communicated utterances usually convey a presumption of their own relevance, and the actual process of interpretation by the hearer/reader is guided by mental heuristics based on the deciphering of communicative intentions, including intentions to deceive or to be true. In this framework, statements guaranteed by religious supernatural entities are a particular kind of "quasi propositions" in Scott Atran's words²⁸ or "semipropositions" in Dan Sperber's²⁹ terms. Such statements are metarepresented³⁰ in a special way; they constitute something of the form "p is x" where p is a statement put apart from usual pragmatic considerations and constraints of ordinary conversation and x is a second-order representation, such as "wanted by the ancestors" or "guaranteed by the gods."

In other words, such semipropositions are a special form of reflective beliefs, whereas intuitive beliefs are formed spontaneously in the individual, often on the basis of perceptual input, such as when we implicitly believe that we are hungry, or that I now hear a particular sound

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on my left, or that I believe that the visual shape of the object in front of me is of a given kind. Reflective beliefs, on the other hand, are constructed from deliberate individual thought or through conversation with others whom we ascribe some degree of authority. These are usually explicit beliefs and they are also embedded in other layers of beliefs,^{31,32} such as when I reflectively believe that this sudden hunger is just the effect of some immoderate desire for sweet things, or that the sound that I hear now corresponds to Jacques' steps on the wooden floor, or that the visual shape that I have in front of me is one whose angles sum 360° . Reflective beliefs are thus the stuff of individually learned beliefs or cultural beliefs, such as, for instance, scientific propositions.

Beliefs in the supernatural are then a special kind of belief because they are reflective, because the statements on the supernatural were learned from elders. At the same time supernatural beliefs are often supported by a myriad of intuitive beliefs that arise very spontaneously, such as those triggered by the inference systems of folk biology (e.g., if totems are animals, they may have kin and be of particular species in an essential way), folk physics (e.g., spirits may be spatially located, such as in a temple), and especially folk psychology (if spirits are agents, they must have thoughts, desires, and intentions). And in addition they depart, by definition, in supernatural ways from the laws that normally regulate the folk inferences, thus carrying information in the form of the breaking of usual expectations. In that respect beliefs on the supernatural are the result of aggregate relevance⁷ because they successfully activate a large range of intuitive systems and emotional reactions that are part of the universal human psyche.

Thus, in the case of quasi-propositions on morality (p is x), the currency of its supernatural origin x should strengthen its pragmatic force or relevance. This supernatural origin is plausibly mentally represented and it conveys the practical force of its authority if it is believed. The representation of the supernatural

origin need not be conscious or complete, it just needs to be intuitively activated and strong enough depending on the case. As we mentioned in the last section, children and adults who were told that a fairy or a ghost could observe their behavior in an experimental setting acted differently even though they did not necessarily believe in fairies or ghosts in the usual sense of *believe*.

In moral quasi-propositions, many norms of a conventional type (but not only conventional norms) are of this form, such that it is a form of authority that enforces them (for instance, "you should sanctify Sabbath" or "the ancestors want us to sacrifice this hen") and is also a form to affect more emotionally relevant negative outcomes, such as "evil spirits forbid us to go into the forest" or "Satan wants you to vote Democrat" (found on the internet). The trust that we portray on such quasi-propositions can be both a spontaneous effect of the often portrayed as a very elevated hierarchical nature of the supernatural figure³³ and also of the fact that these quasi-propositions appear as socially trusted in a given community. What happens is that the content of the quasi-propositions interacts with the trust already conferred to their source. This partly explains how obscurity or opacity of content of the proposition p may inspire awe under the guarantee of the trusted authority of the supernatural entity that guarantees it. In fact, the more opaque a quasi-proposition is, the greater is the chance that a confirmation bias will apply to its interpretation because it allows a variety of construals. This bias will go in the direction of the previously inferred social or supernatural trust on the figure that produces it and is opposite to disconfirmation or falsifiability. To illustrate this effect, we quote here an example given by Dan Sperber³⁴ on the default interpretation of a believer:

Fortune-teller: I see a tall man. . . I see a bird. . . people you care about are in pain. . .

Consultant: Amazing! Yes, everybody was sick after Thanksgiving, and the guy who sold me the turkey was very tall indeed."

2 By dribbling epistemic vigilance, certain su-
3 pernatural statements are very successful in
4 achieving that moral codes are interpreted as
5 **Q17** being true in advance. “The hell is full of blas-
6 phemers,” “The ancestors loathe contamina-
7 tion from menstruum”. By definition you can-
8 not falsify semipropositions; for the one who
9 already trusts the source of this reflective belief,
10 disconfirmation here would require undermin-
11 ing the whole emotional background that sup-
12 ports the world view on which such statements
13 on the supernatural stand. For that reason, the
14 representation of apparently disconfirming evi-
15 dence is often not taken as a sign of incoherence
16 but rather as a hint to a more profound and rel-
17 evant truth.³⁴

18 This phenomenon may have a spontaneous
19 developmental basis in infancy. As developmen-
20 tal psychologists Csibra and Gergely³⁵ have
21 observed, humans since early childhood can
22 imitate and learn opaque actions, the aims or
23 long-term goals of which are unclear for the
24 child. In experimental conditions³⁶ infants even
25 prefer copying the very same gesture instead
26 of achieving the same result by simpler means,
27 precisely because the gesture is opaque in terms
28 of the means-goal structure. The lack of ratio-
29 nality in terms of the economy of the means-
30 end structure points to a deeper meaning. As
31 Csibra and Gergely put it, “indeed, humans,
32 and especially human children, tend to imi-
33 tate apparently meaningless actions much more
34 readily than other species.” This is not irra-
35 tional in itself because in most occasions infants
36 will not be able to fully comprehend the end-
37 means structure of the cultural environment in
38 which they grow up. Thus, statements on super-
39 natural agents as much as statements on com-
40 plex scientific facts taught at school are usually
41 only partially understood by children. Those
42 statements are usually interpreted on the basis
43 of social context and previous trust. The fact
44 that they are not completely clear because they
45 are trusted only hints at the presence of some
46 form of relevant content, and, in the case of ob-
47 scure or counterintuitive supernatural facts, we
could talk of a condition of presupposition of

hyper-relevant content.³⁴ Again, this is not ir-
rationality in action but an inference to the best
explanation based on reliance on social cogni-
tion and observed reputation. All this makes
supernatural quasi-propositions good water for
the mill of conversation stoppers in moral rea-
soning.

Sometimes anti-utilitarian behavior may de-
rive from the content of the moral principles
endorsed in supernatural quasi-propositions.
This is another limiting ground in principle
to the founding of morals by such statements
because it could be expected that extremely
anti-utilitarian behaviors would not be psycho-
logically enforced, not even by reference to the
supernatural—except that in at least one di-
mension this is precisely not the case. And thus
costly and privative behaviors can be enforced
by the supernatural in as much as they convey
valuable social information on the bearer of the
behaviors in question. This is plausibly another
of the reasons that make them so prevalent in
moral systems.

Supernatural Entities and Costly Cooperation

When overt acceptance of the beliefs on
the supernatural held by the group—the phe-
nomenon of theological correctness—is ex-
pressed in public, following the theory of costly
signaling³⁷ this could be a reliable channel of
purporting information on the coalitional qual-
ities of the believer in question. Under costly
signaling theory, overt acceptance of culturally
costly constraints and obligations based on the
supernatural could be like the impressive tail
of the peacock from an evolutionary point of
view—a reliable trait conveying information on
the qualities of its bearer. Although the theory
focuses on what is publicly displayed, and thus
the beliefs and certain types of behavior do not
strictly need to be held sincerely, it also hints at
the possibility that recruitment of sincere emo-
tions and beliefs may be powerful tools in the
development of such displays. The following of

moral supernatural statements may have as a consequence anti-utilitarian dietary restrictions (such as taboos and fasting), costly cooperation, and even extreme altruism but also overt acceptance of extremely counterintuitive beliefs on the supernatural. The evolutionary rationale is that if engaging in overt acceptance of supernatural statements on morality and the prohibitions, admonitions, and constraints that they command may be costly in the short run, it may under certain circumstances confer an increased advantage to the individual in question as it portrays its qualities as an honest and committed coreligionist. These signals are reliable in terms of reputation because they are difficult to fake and they may correlate well with the qualities that other individuals seek in the context of cooperation or trust.

These mentioned mechanisms could be expected to provide part of the answer to the serious empirical possibility that communities based on religious motives may benefit from higher levels of cooperation. Classical Durkheimian sociology suggested that religion increases social cohesion,³⁸ and research with questionnaires have also yielded higher levels of self-reported generosity for religious as opposed to nonreligious people. It is known that discourse, including supernatural entities (such as indivination), may be used to enforce coordination inside a group. Divination practices have been studied in light of solving coordination problems where the cost of making a wrong decision is high for an individual but the cost of not making any decision can be much higher.⁴⁹ Thus, transfer of responsibility to supernatural entities can enforce Nash equilibria in coordination games. Such is perhaps the case in divination practices but certainly also in more sophisticated ways, as in the thoroughly studied case of Balinese water temples. These water temples revealed to anthropologists the structure of a complex decentralized coordination device for irrigation and farming based on supernatural beliefs.^{40,41} Supernatural religious entities could thus help achieve, under certain conditions, increased levels of coordi-

nation, which is consistent with the fact that more populated groups and groups living in atmospheres of scarce resources have been statistically associated with the cultural presence of highly moralizing gods.^{42,43} It is not entirely clear what mechanisms are in action when accounting for these statistical relations.

As previously mentioned, the appetite for costly signaling membership to a specific religion may be one of the processes in action. Richard Sosis⁴⁴ has reviewed how utopian secular and religious communities founded in the USA in the 19th century have survived differentially and has studied this survival rate in relation to the number of costly sacrifices imposed by the community. He found some positive correlation between the number of imposed constraints and survival of the communities. In another study Sosis and Ruffle⁴⁵ compared subjects from secular and religious kibbutz communities playing one economic game in which two anonymous players are offered an amount of money to share but both obtain nothing if the sum of their mutual demands exceeds the initial quantity. They found that subjects from a religious kibbutz did better at this game by requesting significantly less money than subjects from a secular kibbutz. How could supernatural agents play a causal role in enforcing moral statements on such communities? One possibility is that supernatural symbolism articulates the space of coalitionary thinking by defining group membership and eliciting “groupishness,” or it may also increase reputational concerns. Another simpler possibility is that priming on supernatural agents activates some form of concern for being watched. This is the purported “fear of supernatural punishment,”²³ a mechanism proposed to explain the increased level of prosocial behaviors elicited by thinking on supernatural agents and that we mentioned as one of the emotions in the first section of the article. Recently Shariff and Norenzayan⁴⁶ primed subjects playing an anonymous dictator game with God concepts and they found an effect on increased generosity both in religious and nonreligious participants.

Certainly in many situations punishment and fear of it can stabilize cooperative behavior. This stabilizing effect on norms can be served by supernatural agents in a particularly cheap and fast way in the absence of more costly human institutions as the individual activates the representation of some form of supernatural punishment. The reason for this is intrinsic to mental representation of supernatural agency and the role of supernatural entities as founders of many moral statements: since childhood, humans represent supernatural agents with particular epistemic capacities. It has been shown, for instance, that 5-year-old children in the USA are more prone to interpret beings in the afterlife as having epistemic states (knowing, seeing, thinking, wanting) than as having psychobiological mental states (hunger, thirst, sleepiness).⁴⁷ They are also usually “full-access strategic agents”.⁷ For this reason supernatural entities are more intuitively represented as involved in moral life with their intentions and desires rather than as acting in a physical-mechanistic way.

Conclusions

Even though we know we have left many questions unanswered, can we now consider how the above-mentioned qualities of supernatural agents help them to be prevalent in moral discourse anywhere around the globe? Cognitive anthropology informs us that humans are not gullible unselective imitators of any cultural material but that they selectively and discriminatively process some cultural information more than others. The cross-cultural prevalence of the link between supernatural entities and morality could be explained by the selective advantage of some biological adaptation of the human brain, or through ecological recurrence that evokes the traits in question, or yet by a shared historical cultural ancestor that determined the subsequent cultural history of the different human lineages sharing the trait. Although these three frameworks may

be of some utility as working hypotheses, we have here showed how current cognitive science can provide a satisficing explanation of many features without the need of postulating any special adaptation for religion. As a result of universal features of the human mind and human living, supernatural entities constitute a cultural content that is recurrently found in our species.²⁸ They are a natural byproduct of the human psyche and human ecology. They may thus be considered as “attractors” in the space of the long-term changes of different cultures.⁴⁸ As Pascal Boyer⁴⁹ states: “Some types of representations and associations are intrinsically easier to acquire, remember, and communicate than others” (p. XXX). Supernatural entities as the ones mentioned in this article are among these.

Yet in the human diverse spectrum of moral life and moral discourse, supernatural entities are also a recurrent feature through which explicit justification is provided for many norms. In the landscape of possible configurations of moral life, they also provide such an example of cultural and psychological attractor. They elicit special emotional reactions, provide opportunities for costly signaling, and provoke thoughts of supernatural punishment that enforce norms; they challenge the usual constraints on pragmatic interpretation of discourse. In sum, they furnish cost-efficient conversation stoppers that usually trump other considerations. These characteristics of supernatural agents join together to canalize the evolution of morality and they provide reliable ground for founding sacred values. Thus, in light of much of current cognitive theory, supernatural sacred values make sense as basins in the landscape²⁸ of human morality.

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Conflicts of Interest

The authors declare no conflicts of interest.

References

1. Dennett, D. 1995. *Darwin's Dangerous Idea. Evolution and the Meanings of Life*. Penguin. USA.
2. Joyce, R. 2006. *The Evolution of Morality*. MIT Press. Cambridge, MA.
3. Dawkins, R. 2006. *The God Delusion*. Mariner Books. USA.
4. Greene, J. & J. Haidt. 2002. How (and where) does moral judgment work? *Trends Cogn. Sci.* **12**: 517–523.
5. Sperber, D. & L. Hirschfeld. 2004. The cognitive foundations of cultural stability and diversity. *Trends Cogn. Sci.* **1**: 40–46.
6. Haidt, J. 2000. The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychol. Rev.* **108**: 814–834.
7. Boyer, P. 2000. *Religion Explained*. Random House. UK.
8. Barrett, J. 2004. *Why Would Anyone Believe in God?* Altamira Press. USA.
9. Kelemen, D.A. 2004. Are children “intuitive theists”? Reasoning about purpose and design in nature. *Psychol. Sci.* **15**: 295–301.
10. Boyer, P. 2003. Religious Thought and Behavior as By-Products of Brain Functions. *Trends Cogn. Sci.* **7**: 119–24.
11. Norenzayan, A. *et al.* 2006. Memory and Mystery: The cultural selection of minimally counterintuitive narratives. *Cogn. Sci.* **30**: 531–553.
12. Sperber, D. 1985. *On Anthropological Knowledge*. Cambridge University Press. Cambridge, UK.
13. Prinz, J. 2007. *The Emotional Constructions of Morals*. Oxford University Press. Oxford, UK.
14. Evans, J. 2003. In two minds: dual process accounts of reasoning. *Trends Cogn. Sci.* **10**: 454–459.
15. Prinz, J. 2004. *Gut Reactions: A Perceptual Theory of Emotion*. Oxford University Press. New York.
16. Huebner B. *et al.* 2009. The role of emotion in moral psychology. *Trends Cogn. Sci.* **13**: 1–6.
17. Greene, J.D. *et al.* 2001. An fMRI investigation of emotional engagement in moral Judgment. *Science* **293**: 2105–2108.
18. Baumeister, R.F. *et al.* 2001. Bad is stronger than good. *Rev. Gen. Psychol.* **5**: 323–370.
19. Tetlock, P. 2000. The psychology of the unthinkable: taboo trade-offs, forbidden base rates, and heretical counterfactuals. *J. Pers. Soc. Psychol.* **78**: 853–870.
20. Ginges, J. *et al.* 2007. Sacred bounds on rational resolution of violent political conflict. *Proc. Natl. Acad. Sci. USA* **18**: 7357–7360.
21. Rozin, P. *et al.* 2000. The CAD triad hypothesis. A mapping between three moral emotions (contempt, anger, disgust) and three moral codes (community, autonomy, divinity). *J. Pers. Soc. Psychol.* **4**: 575–586.
22. Fiske, S.T. 2004. *Social Beings: A Core Motives Approach to Social Psychology*. Wiley & Sons Inc. New York.
23. Johnson, D. & J. Bering. 2006. Hand of God, mind of man: Punishment and cognition in the evolution of cooperation. *Evol. Psychol.* **4**: 219–233.
24. Bering, J. M. 2006. The folk psychology of souls. *Behav. Brain Sci.* **29**: 453–482.
25. Damasio, A. 1994. *Descartes' Error: Emotion, Reason and the Human Brain*. Putnam Publishing. USA.
26. Tetlock, P.E. 2003. Thinking about the unthinkable: Coping with secular encroachments on sacred values. *Trends Cogn. Sci.* **7**: 320–324.
27. Sperber, D. & D. Wilson. 1986. *Relevance: Communication and Cognition*. Blackwell. Oxford, UK.
28. Atran, S. 2002. *In Gods We Trust: The Evolutionary Landscape of Religion*. Oxford University Press. USA.
29. Sperber, D. 1982. Apparently irrational beliefs. In *Rationality and Relativism*. S. Lukes & M. Hollis, Eds.: 149–180. Blackwell. Oxford, UK.
30. Sperber, D. 2000. Metarepresentations in an evolutionary perspective. In *Metarepresentations: A Multidisciplinary Perspective*. D. Sperber, Ed.: 117–137. Oxford University Press. Oxford, UK.
31. Tremlin, T. & T. Lawson. 2006. *Minds and Gods. The Cognitive Foundations of Religion*. Oxford University Press. Oxford, UK.
32. Sperber, D. 1997. Intuitive and reflective beliefs. *Mind Language* **1**: 67–83.
33. Haidt, J. & S. Algoe. 2004. Moral amplification and the emotions that attach us to saints and demons. In *Handbook of Experimental Existential Psychology*. J. Greenberg, S.L. Koole & T. Pyszczynski, Eds.: Guilford. New York.
34. Sperber, D. 2003. The guru-effect. <http://www.dan.sperber.com/guru.htm>.
35. Csibra, G. & G. Gergely. 2006. Social learning and social cognition: The case for pedagogy. In *Processes of Change in Brain and Cognitive Development, Attention and Performance, XXI*. Y. Munakata & M.H. Johnson, Eds.: 249–274. Oxford University Press. Oxford, UK.
36. Gergely, G. & H. Bekkering & I. Király. 2002. Rational imitation in preverbal infants. *Nature* **415**: 755.
37. Nesse, R. 2001. *Evolution and the Capacity for Commitment*. Russel Sage Press. New York.
38. Durkheim, E. 1912/1968. *Les formes elementaires de la vie religieuse*. Les Presses Universitaires de France. Paris, 1968.
39. Dennett, D. 2006. *Breaking the Spell. Religion as a Natural Phenomenon*. Viking Books. USA.

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40. Lansing, J. & J. Kremer. 1993. Emergent properties of Balinese water temple networks. *Am. Anthropol.* **1**: 97–114.
41. Lansing, J. & J. Miller. 2004. Cooperation, games and ecological feedback. Some insights from Bali. <http://zia.hss.cmu.edu/miller/papers/bali.pdf>
42. Roes & Raymond. 2003. Belief in moralizing gods. *Evol. Hum. Behav.* **2**: 126–135.
43. Bourrat, P. 2008. Gods and cooperation: testing two hypotheses using cross-cultural data. unpublished manuscript.
44. Sosis, R. 2000. Religion and intra-group cooperation: preliminary results of a comparative analysis of utopian communities. *Cross-Cultural Research* **34**: 70–87.
45. Sosis, R. & B. Ruffle. 2003. Religious Ritual and Cooperation: Testing for a Relationship on Israeli Religious and Secular Kibbutzim. *Curr. Anthropol.* **44**: 713–722.
46. Shariff, A.F. & A. Norenzayan. 2007. God is watching you: Priming God concepts increases prosocial behavior in an anonymous economic game. *Psychol. Sci.* **9**: 803–809.
47. Bering, J. M. & D.F. Bjorklund. 2002. The immortal mind: How human cognitive systems breed ghosts. Paper presented at *Meeting of Minds and Gods: Cognitive Science of Religion*, Ann Arbor.
48. Claidiere, N. & D. Sperber. 2007. The role of attraction in cultural evolution. *J. Cogn. Culture* **7**: 89–111.
49. Boyer, P. & B. Bergstrom. 2008. Evolutionary perspectives on religion. *Annu. Rev. Anthropol.* **37**: 111–130.