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CAMBRIDGE UNIVERSITY PRESS affiliations and devoutness among experimental subjects may be somewhat independent of how supernatural beliefs – in general – influence people's behavior (M&D predict an interaction of personal religious devoutness and behavior). Current experiments may not, therefore, be able to differentiate the behavior of "believers" and "non-believers" – Joe Bloggs may be an avowed atheist who, on his way to Las Vegas, is nevertheless very concerned about seeing a black cat or wearing his lucky jacket or what his grandmother would have said.

Second, even if we had incontrovertible evidence that supernatural cues (e.g., via experimental primes) promoted higher donations in economic games, this is far from evidence that religious beliefs are biologically *adaptive*. On the contrary, it could be evidence that religious primes turn people into suckers who give away precious resources. Such behavior, on its own, would not survive natural selection – without additional field experiments measuring fitness consequences, evidence for altruism is hardly evidence of an adaptive trait. Therefore, the (excellent) current laboratory experiments that M&D focus on cannot yet be used as deal-breakers as to whether (mis)belief is adaptive or not.

Third, having rejected supernatural beliefs as adaptive, M&D's null hypothesis is that religious beliefs are a non-adaptive byproduct of cognitive mechanisms adapted for other purposes – evolutionary accidents, in other words. However, if religious beliefs are accidental byproducts, we might expect natural selection to have eradicated them because (as M&D note) they impose significant fitness costs in terms of time, effort, and resources (Sosis & Alcorta 2003). So why do they persist?

Even if some religious beliefs persist as "sticky" cultural parasites, it does not preclude them from also promoting individual or group fitness at certain times or contexts (in which case they may not be "parasites"). The universality and power of religious beliefs of some form or other – despite their costs – to billions of people around the world, every culture in history, and every hunter-gatherer society, strongly suggests that religion confers adaptive fitness benefits, for individuals and/or groups (at least in some contexts, for some people, and for some periods of human history). Of course, universality need not imply adaptation: other non-adaptive traits such as chins and male nipples are also globally and historically universal. However, they do not impose significant costs. Religion does.

The only theories that solve this paradox are religion-as-adaptive hypotheses that propose how costly (mis)beliefs beget even greater benefits for individuals and/or groups (Johnson 2008; Norenzayan & Shariff 2008; Sosis & Alcorta 2003; Wilson 2002), or are outweighed by the costs of non-belief (Cronk 1994; Johnson 2009; Johnson & Bering 2006). Byproduct theories of religion offer no solution to its greatest puzzle, for God would be a costly accident.

A positive illusion about "positive illusions"?

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Abstract: Rather than being a genuine adaptation, "positive illusions" are examples of doxastically uncommitted policies implemented at both the individual and societal levels. Even when they are genuine misbeliefs, most positive illusions are not evolved but ephemeral – a phenomenon limited to a particular social and economic moment. They are essentially a consumer response to messages from the pop-psychology industry in the recently terminated era of easy credit.

The article by McKay & Dennett (M&D) presents a thoughtful classification and analysis of the evolutionary issues involved in misbelief. The notion that certain misbeliefs may arise through the normal functioning of the belief-formation system (as opposed to its breakdown), by virtue of relying on incomplete or inaccurate information, is clearly acceptable (and not new). What is debatable, however, is the authors' key proposition, that a subclass of such misbeliefs has been systematically adaptive in the evolutionary past. The usefulness of this suggestion depends to a large extent on finding an example that meets the authors' commendably sound and strict criteria, yet the sole example of adaptive, evolved misbelief that is proposed by M&D, "positive illusions," is not convincing.

One should first note that the concept of positive illusions, as well as the term itself and psychologists' (mis?)beliefs about the positive consequences of self-serving distortions of reality, are all of quite recent vintage (e.g., Taylor 1989). M&D helpfully contrast this view of mental health with Jahoda's (1958) earlier and more measured one. Whether or not one wishes to engage in culture-theorizing about the contrast between the fear of social ridicule and the self-restraint evident in the Eisenhower era (demonstrated, for example, in Asch's [1956] "social conformity" experiments), on one hand, and the less-disguised greed and self-promotion of the more recent I-want-it-all-now generations, on the other, the fact is that the content of many positive illusions is a quite recent phenomenon and that the results of many of the studies are likely to be ephemeral and support Gergen's (1973) "social psychology as history" view. It is therefore risky (if not unwarranted) to be talking about the creation and implementation of misbelief as adaptive - let alone adapted – selection-driven behaviors (see the authors' Note 3).

There are also questions about the empirical evidence marshaled by M&D (all of it dating from after about 1985). A number of studies purporting that "most people ... see themselves as better than most others on a range of dimensions" (target article, sect. 13, para. 2) appear to be methodologically unsound. M&D should have more closely examined the presence of problems and alternative explanations related to the framing of questions, the differential social desirability of various response alternatives, and the Pygmalion effect before implying that positive illusions were present and favored in the ancestral environment. In addition, quotes from psychologists firmly committed to the environmentalist position – such as the social-learning theory, with its (mis?)beliefs about the teachability and ready amelioration of just about every personal shortcoming – cannot be considered an entirely unbiased source.

Other studies have tended to ignore the participants' referential framework and may not have dealt with *mis*beliefs. For example, people who claim that their current partner is better than most are likely to be referring to their past partners' failings and the undesirable traits and behaviors of people in all those failed marriages that they know and read about. Even with regard to an inflated opinion of one's children, studies have presumably not polled the opinions of the parents (including potential ones) who terminated pregnancies - or who committed infanticide, physical and/or sexual abuse, and the more common acts of neglect. If even such parents, as is possible and even likely, were to have an inflated idea of the merits of their offspring and potential offspring, this would raise interesting questions about the meaningfulness of using the questionnaire-retrospective research approach to probe matters relevant to evolutionary adaptation.

To the extent that positive illusions can, in fact, be adequately documented (regardless of whether or not they are evolved, adaptive misbeliefs), it is of interest to try to place them in a broader contemporary context. If people's positive illusions about their personal worth and ability are translated into behavior evident to others, all sorts of negative consequences are likely to ensue, from mild ridicule to severe ostracism. Unless, that is, the unbridled expression of positive illusions has been

proclaimed a desirable social norm. It is clear that there is no shortage, perhaps especially in the United States, of change agents, and socio-cultural, economic, and even legal factors, involved in the encouragement of positive illusions: the generally prevailing environmentalist ("nurture") bias in the educational system and mass culture; the politico-legal doctrine of universal entitlement and reduced personal responsibility (including exaggerated emotivist explanations of both legal and illegal behavior); and the broad societal push toward spending on credit, embodied in the "optimistic" (something for nothing, "no money down") consumption-based policies for one's alleged betterment and advancement. The empirical findings, to the extent that they are reliable and valid in the first place, document what is essentially a consumer response to the ubiquitous messages from the pop-psychology and advertising industries, which make wildly unrealistic promises and encourage an assertive expression of self-worth. Most of these are American homegrown products, but they have been distributed widely, especially in the Western world.

However, the present financial crisis may have already provided a corrective to positive illusions at both the personal and societal levels. The crisis has certainly led to a dramatic drop in the previously inflated average self-image, for example, by people in countries as different as Iceland and Latvia. Predictably, Western politicians and bankers will resist this trend. Quite recently, in the *Financial Times*, the executive chairman of the giant international banking concern HSBC declared: "About 80 per cent of this country [United Kingdom] considers itself middle class. I doubt that was true then [a generation ago]" (Barber 2009). Yet, on the same date and in the same news source, it was reported that McDonald's is the largest private employer in *France* (Morrison 2009).

One is left with the conclusion that rather than being a genuine adaptation, most positive illusions are examples of doxastically uncommitted action policies implemented at both the individual and societal levels; and even when they are doxastically relevant, genuine misbeliefs, they are unlikely to be evolved and adaptive – and are instead an ephemeral phenomenon limited to the present social and economic moment. Or perhaps limited to the recent past, for there are already signs of a reduction of positive illusions as a function of the current financial crisis.

Benign folie à deux: The social construction of positive illusions

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Abstract: McKay & Dennett (M&D) have done an admirable job of distinguishing among various forms of misbelief and evaluating the idea that they stem from evolved mental mechanisms. We argue that a complete account of misbeliefs must attend to the role that others play in creating and maintaining positive illusions.

In their analysis of the sources of misbeliefs, McKay & Dennett (M&D) focus on how belief-producing mental mechanisms are designed. Although people may develop beliefs on their own and cherish them in private, they acquire many of their beliefs from others, and they use other people to evaluate them. Often, these beliefs pertain to ephemeral phenomena for which there are no objective criteria, such as whether one is

likable or attractive. In contexts in which individuals stand to benefit from accurate representations of reality, they may solicit reality checks from others and correct their beliefs accordingly. However, when individuals stand to benefit from misrepresentations of reality, they may manipulate others into validating them, which in turn may help the manipulators believe that the misrepresentations are true.

Evolutionary theory leads us to expect people to be disposed to seek the truth when truth-seeking is the most adaptive strategy. However, truth-seeking is not always the most adaptive strategy, and the evidence clearly establishes that people are not naturally inclined to process all social information in objective or impartial ways. As expressed by Haidt:

Research on social cognition ... indicates that people often behave like "intuitive lawyers" rather than like "intuitive scientists".... Directional goals (motivations to reach a preordained conclusion) work primarily by causing a biased search in memory for supporting evidence only.... Self-serving motives bias each stage of the hypothesistesting sequence, including the selection of initial hypotheses, the generation of inferences, the search for evidence, the evaluation of evidence, and the amount of evidence needed before one is willing to make an inference. (Haidt 2001, p. 821)

Strategies of social belief validation. People invoke several strategies to maximize the probability that others will validate their misbeliefs about themselves and others. First, they express their misbeliefs selectively to those they consider most likely to validate them - usually people who have a vested interest in the misbeliefs or in pleasing the misbelief-holder. For example, in conversations with in-group members, people express beliefs that favor their in-groups and demean their outgroups, and they express beliefs about their worth to their friends and relatives. M&D give examples of positive illusions that increase people's chances of surviving by improving their health. Because such beliefs also may benefit those whose fitness is linked to sick people's welfare, these people may have a vested interest in adopting and supporting them. For example, believing that a friend, mate, or relative will recover from an illness may induce one to behave in ways that increase the probability of him or her recovering, which in turn may enhance one's welfare.

Second, people buttress the misbeliefs they voice to others with a biased sample of evidence. For example, people may brag about their successes and hide their failures. And finally, people turn to others to support their misbeliefs. For example, Denton and Zarbatany (1996) found that when people made mistakes, they made excuses to their friends, who in turn supported them. An interesting dynamic often occurs when people express a biased sample of evidence to their friends in support of their misbeliefs: Their friends end up forming more extreme misbeliefs than the people seeking validation are comfortable accepting. For example, Krebs and Laird (1998) found that participants' friends made more exculpating judgments for the transgressions that the participants committed than the participants made themselves.

Social conspiracies. Friends and relatives tend to engage in a subtle form of reciprocity with respect to positive illusions about one another – "You support my illusions, and I will support yours" – which gives rise to benign folie à deux: "You are wonderful." "So are you." In some cases, this initiates a self-fulfilling prophesy. If each of us thinks that the other is socially attractive, funny, beautiful, of high worth, then our beliefs are at least partially validated.

Adaptive functions of illusions about one's worth. In an earlier paper, we asserted that illusions about one's own worth are adaptive because they help people deceive others about their worth (see Krebs & Denton 1997). M&D questioned this assertion, because they questioned whether "others *are* deceived about the worth of self-deceptive individuals" (target article, sect.