



On the origins of enchantment: not such a puzzle

Paul Seabright

To cite this article: Paul Seabright (2019): On the origins of enchantment: not such a puzzle, Religion, Brain & Behavior, DOI: [10.1080/2153599X.2019.1678517](https://doi.org/10.1080/2153599X.2019.1678517)

To link to this article: <https://doi.org/10.1080/2153599X.2019.1678517>



Published online: 27 Dec 2019.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)



On the origins of enchantment: not such a puzzle

Paul Seabright

Toulouse School of Economics (Institute for Advanced Study in Toulouse), Université of Toulouse Capitole, Toulouse, France

ABSTRACT

The fact that adherents of most religions subscribe sincerely to many counter-empirical beliefs has been argued to pose a challenge to evolutionary explanations of religion, since natural selection is considered to have developed sophisticated cognitive mechanisms to enable prehistoric foragers to survive in harsh environments. I argue here that most counter-empirical beliefs held by members of most religions are optional most of the time, and were optional all of the time in prehistory. Beliefs held by foragers and other individuals in situations where survival may depend on them are not very counter-empirical compared to locally available alternatives. More generally, human beings are *cognitively extravagant*—that is, they are capable of entertaining beliefs about a large number of things other than their immediate physical environment, but it is only in modern environments that their cognitive extravagance typically becomes costly enough to pose a problem for evolutionary explanation. In a nutshell, counter-empirical beliefs are a by-product rather than a precondition of religious membership and practice, and were unlikely to have been adaptively costly in environments that were evolutionarily relevant for human beings.

ARTICLE HISTORY

Received 15 January 2019

Accepted 14 August 2019

KEYWORDS

Belief; evolution; foragers; religion

1. Introduction

Is it really such a mystery that natural selection should have produced in *Homo sapiens* a creature capable of believing that invisible spirits exist, act in the world, care about the actions and welfare of human beings, and are willing to modify their own behavior according to the requests and prayers those human beings address to them? Such beliefs have no empirical foundation, and a by now substantial literature in evolutionary anthropology treats this as a serious puzzle, since in that literature it is emphasized how sophisticated in other respects are the cognitive abilities of foragers. The near-ubiquity of such counter-empirical beliefs among modern adherents of religion, and the fact that they are widespread in all human societies whose beliefs we have been able to document, leads many if not most researchers in this field to conclude that they are a necessary part of religious practice and of very ancient origin, and to seek reasons why the ability to subscribe to such beliefs must have been adaptive in prehistoric human societies.¹ To summarize, the claim is that religion:

- (a) has attracted substantial numbers of adherents in all known human societies;
- (b) is seriously counter-empirical;
- (c) is necessarily counter-empirical in the sense that being a religious adherent *requires* subscribing to counter-empirical beliefs rather than merely being statistically associated with an increased likelihood of doing so;

- (d) as a result has significant adaptive costs, in the sense that who hold these counter-empirical beliefs would have lower fitness than otherwise similar individuals who did not hold them; and therefore
- (e) must have had in the past, and may still have now, substantial adaptive benefits that offset these adaptive costs for its adherents.

In what follows I shall call this claim the ACE—the Argument from Counter-Empiricism. In this paper I accept assertion *a* but challenge *b*, *c* and *d*, therefore their joint implication *e*.

Assertions *b*, *c* and *d* are the subjects of sections 2–4 respectively.

Assessing ACE is not straightforward since claim *b* is ambiguous, and appears in several versions, which are not always clearly distinguished by those who defend it. For beliefs to be counter-empirical may mean that they are considered clearly contrary to what is considered to be relevant empirical evidence by (1) the person making the claim; (2) other members of some relevant reference group in the believer's society; or (3) the believer herself in other similar contexts.

There is no serious dispute that some of the metaphysical beliefs held by believers in some of the world's religions are seriously counter-empirical in the first sense of the term² (and are typically considered incredible by members of rival religions, not just by atheists, so are therefore also seriously counter-empirical in the second sense as well).³ Nevertheless, in this paper I argue that the fact that members of *Homo sapiens* are capable of holding these beliefs is less of a mystery than it seems. The steps of the argument are as follows:

- (1) The fact that religious beliefs may be counter-empirical in sense (1) does not entail that they are or were always counter-empirical in senses (2) or (3). In many recorded societies religious beliefs have not been incompatible with what is considered relevant empirical evidence by either their peers or by themselves in other contexts.
- (2) Most counter-empirical beliefs held by members of most religions are optional most of the time, and were probably optional all of the time in prehistory. That is, they are not strictly required for members to join and to be entitled to the benefits of membership. They appear to be mostly a by-product of membership rather than a condition of membership. There is indeed a strong statistical association between adhering to religion and holding counter-empirical beliefs. But whereas much analysis of this association has inferred that people sign up to religion because they are disposed to believe its claims, here I propose that the causality runs in the opposite direction: people are disposed to believe the claims of religion because they have already signed up to it.
- (3) The adaptive cost to believers of holding these counter-empirical beliefs is highly variable. Counter-empirical beliefs held by foragers and other individuals in situations where survival may depend on them are not very maladaptive, in the sense that few alternative empirically validated beliefs with higher survival value are available. Highly maladaptive beliefs are found almost exclusively among the religions developed in later agricultural and post-agricultural societies that generate a substantial economic surplus.
- (4) More generally, human beings are *cognitively extravagant*—that is, they are capable of entertaining beliefs about a large number of things other than their immediate physical environment. The ability to do so has evolved because it has enabled cooperation to develop on a much larger scale and over longer periods of time than are possible among other animals. But cognitive extravagance entails increased risks of exploitation by others. In modern societies some of the costs of such exploitation have become much higher than they are typically among foragers, although even among foragers they may be important for individual fitness.

It is important not to over-simplify the distinction between the forager societies within which modern humans evolved (which were certainly widely heterogeneous) and agricultural or post-agricultural societies (which were also heterogeneous and which also overlapped with forager societies

along some important dimensions, rather than marking a clear break from them in terms of beliefs, practices and social organization). Nevertheless, there are certain characteristics of many agricultural and post-agricultural societies (social stratification, production of substantial economic surplus, and the emergence of significant economic specialization, including in the provision and management of religious ritual) that are widely agreed to have been much less present in the kinds of forager society in which modern humans evolved. I argue here that in the absence of these characteristics it is unlikely that religious beliefs we would now consider to be counter-empirical were adaptively very costly to individuals.

The argument of this paper can be situated within a more general argument about the costs of religion. These costs include not only counter-empirical beliefs but also constraints on personal behavior, time-consuming participation in ritual and other activities, and expensive financial contributions (such as tithes). How are these compatible with religion not only surviving but even thriving in the prehistoric, historical and modern worlds? Three possible answers, not mutually exclusive, can be given. The first is that some apparently costly requirements of religion are not really as costly as they seem. The second is that some such costs are in fact payments for valuable services. The third is that some such costs in fact function as signals of certain personal characteristics, and the ability to send such costly signals is strategically valuable for believers as it enables them to associate with other individuals whose partnership is valuable for them. This paper develops the first of these three answers for the case of counter-empirical beliefs: these are not really as costly as they seem, and as the recent scientific literature has taken them to be.⁴

2. The counter-empirical nature of religious beliefs

It is easy to come up with many examples of religious beliefs, from modern as well as traditional societies, that are in clear tension with the empirical evidence gathered by modern science. This shows that many or perhaps most forms of modern religion are clearly counter-empirical in the first sense of the term defined above, and to the extent that they are also considered incredible by members of rival religions, in the second sense as well. However, it does not imply that these religions are counter-empirical in the third sense, and more importantly it does not tell us much if anything about the counter-empirical character of folk religion, of the kind that more closely resembles the beliefs of forager societies than do the modern religions of the book.

There are good reasons for thinking that the beliefs embodied in many kinds of folk religion were much less in tension with what was considered to be relevant empirical evidence in the societies in which they developed than they are with the empirical basis established by modern science. Two examples in particular stand out.

The best known example is the central theme of Richard Dawkins's book *The Blind Watchmaker* (Dawkins, 1986), which argues that prior to Darwin we did not have the intellectual resources to show what is wrong with the argument from design. It was vastly more reasonable to explain the order of the natural world in terms of invisible intentional agents than to think it had come about through unintentional causal processes.

There is a second example that has received less attention, which is that modern science has given us a radically new view of what happens in dreams. The anatomical science of the human brain has given us an intellectual framework to account for the strangely altered perception of reality that we experience in dreams. Prior to this, it was not unreasonable to think that our spirits could leave our bodies while we slept and fly invisibly through the world, that phenomena observed in dreams (such as talking animals or plants) might be as real as those observed in the waking world, or that one might through dreams have foreknowledge of the future. These beliefs now seem (and are) ridiculous, but they were not always so.

Science has raised the bar for credibility.⁵ Similar arguments apply to many views that are now widely accepted as obvious by educated people (the roundness of the earth or the atomic theory of matter) but which were far from obvious to earlier generations.

One way of describing the process by which modern science has modified our conception of the counter-empirical character of certain beliefs is through a process of ontological pruning. Infants in modern societies routinely ascribe agency to many objects, visible and invisible in the world around them, and gradually learn from adults and older children that some of these do not after all have agency. In many pre-modern communities, both forager societies and traditional agricultural societies, the process of ontological pruning would have been less radical and would have left untouched many of the ascriptions of agency to invisible spirits in the external world. The scientific worldview has pruned many of the ontological commitments of earlier generations, in particular to spirits that exercise agency in the world, though often by substituting other ontological commitments of its own, such as to invisible forces such as gravity or to invisible entities such as quarks.

Folk religion is no different from many other aspects of folk science in appealing to concepts and entities that have no place in modern science. We can easily forget that this is true of other aspects of folk science, because anthropologists have emphasized the impressive cognitive skills of foragers, whether it is their grasp of folk biology, including the habits of the animal and plant species they track (Atran, 1998; Boyer, 2001; Mithen, 1996), or their overall general intelligence (Diamond, 1999). Scholars have been understandably keen to compensate for earlier generations' characterization of forager cultures as "primitive," and in any case the argument is almost certainly correct.

However, as the more recent literature on the social nature of intelligence has emphasized (Henrich, 2015), the content of our beliefs about our natural environment depends not just on how cognitively competent we are but on how we integrate our intelligence with the content of the beliefs we inherit from our social environment. Highly cognitively skilled individuals may find themselves having to function in a natural and social environment with very maladaptive beliefs. For example, the beliefs that highly trained first-world scientists have about their natural environment when trying to survive in the Arctic or the Australian outback might strike the indigenous inhabitants of these regions as highly "primitive" (Boyd, 2017).

But that would be no more a reflection on their relative cognitive skills than would the observation that aboriginal Australians have not come up with the theory of relativity.

In the process of this discussion there has been a tendency to write as if, on average, all the beliefs of members of forager communities should be presumed by default to be as much empirically validated, by our standards, as those of members of industrialized societies. Once we take into account the importance of social learning this conclusion evidently does not follow. Empirical validation of hypotheses about the natural world does not take place again and again for each individual; societies do not re-invent the wheel. I believe that the germ theory of disease is superior to the miasma theory not because I have conclusively tested one theory against the other but because others have, because I trust those others, and because such empirical observations as I have been able to make are consistent with the conclusions of those others. It is therefore no reflection on the cognitive skills of anyone to say that the empirical validity of much of the medical knowledge I have is way superior to the medical knowledge of most past or present day foragers, just as their knowledge of the flora and fauna of their foraging environment is massively superior to mine.

Kim Sterelny develops this argument in claiming that "by and large, small world folk medicine is appalling" (Sterelny, 2018), and he offers an explanation of the difference between medicine and foraging techniques in terms of the informational opacity of the former and the comparatively easy verifiability of the latter (an argument developed in more detail in Sterelny, 2007). He implies that if we expect small world folk religion only to be no more counter-empirical than small world folk medicine, the threshold will be easily met. In sum, therefore, folk religion may not be more counter-empirical with respect to the standards of the communities in which it is practised than are many other everyday aspects of those communities' representation of their environment. I return to this argument in section 4 below.

3. The optional character of most counter-empirical beliefs

The history of Christianity has almost certainly biased scholars of religion into thinking that belief is a much more important marker of religious affiliation than it really is. One of the main acts of the Council of Nicea, convened by the Emperor Constantine in 325 CE, was to dispatch the Arian heresy, thereby “settling” the question whether the Son had been “begotten” by the Father and thus whether Christ was in some sense a lesser being than God the Father. It goes without saying that this question was not settled by scientific or empirical arguments.⁶

It is doubtful whether more than a tiny handful of the more than a thousand attendees of the Council knew or cared whether the Son had been begotten, still less whether the Father and Son were “consubstantial,” as the Nicene Creed was to put it. Nor would they have been able to give a coherent account of what either term meant and why it all mattered. But they would certainly have known, and have cared very much, on which side of the argument they found themselves and what that meant for their alliances and their political future. Being an adherent of the Arian heresy was a matter of who your friends were much more than it was a matter of what specific theological assertion you found most convincing. Imagine if someone came to you and asked you at the point of a sword whether you think God is a “wibble” or God is a “wobble”; you’d be inclined to find out their own point of view and convince them that you agreed with them. You certainly wouldn’t dwell on the rather academic point that you’re not quite certain what the difference is between a wibble and a wobble. And what the point of a sword can accomplish in an instant can be brought about, less rapidly but no less reliably, by the steady tug of ambition and interest.

If this was true of the vast majority of the bishops and deacons who came to the Council, how much more true must it have been of the vast flocks of the faithful, who were associated thereafter with one or other of the contending factions, who cannot have cared in the slightest about the theological niceties, but who cared very much about whether it was their side or the other that emerged victorious from the Council.

The fact that the recitation of a “creed” (a word obviously derived from the Latin “credere,” meaning to believe) has become an integral part of Christian worship since then, might seem to suggest that belief became a necessary condition of belonging to the Church at least after the Council of Nicea even if not before. But this conclusion would be mistaken. There is no reason to think that establishing the importance of correct belief as such was what a creed was supposed to achieve. The original Greek word for a creed was σύμβολον (*symbolon*), which referred originally to a mechanism for verifying someone’s identity by matching two halves of a broken object. And the recitation of a creed was supposed to signal whose side the believer was on, not what piece of theology might be passing simultaneously through their mind as they were speaking.

So the fact that the original Nicene creed of 325 went through a large number of revisions before the Council of Constantinople in 381 adopted what has come to be the more widely used version (sometimes called the Niceno-Constantinopolitan Creed) was not a sign that the drafters were trying to adjust the words to their developing understanding of what God the Father and Son were actually like, as if they were experimenters trying to revise a scientific paper.⁷ Instead they were engaging in a piece of necessary factional politics, bringing on board the allies they needed and setting up barriers against those they wanted to exclude.

We should have a similar understanding of later controversies,⁸ such as the “*Filioque*” dispute that split the Eastern and Western churches in 1054 and was still considered important enough in 1995 for the Vatican to issue a clarificatory statement that while the words καὶ τοῦ Υἱοῦ (“and the Son”) would indeed be heretical if used with the Greek verb ἐκπορεύομαι, the word *Filioque* is not heretical when associated with the Latin verb *procedo* and the related word *procession*. Refusing to include a disputed phrase, as the Eastern Church has done and still does, should not be understood as trying to resist a certain description because the description would be wrong. It should be understood as trying to resist giving legitimacy to the parties that are lobbying for the

phrase. To claim in reply that the phrase is not heretical in Latin even if its Greek translation may indeed be heretical is evidently an exercise in constructive diplomacy rather than in objective meta-physical description. If theological assertions have any claim to be factual, their truth cannot depend on the language in which they are stated provided the translation between languages is accurate.

The point of developing this example is to show that even in respect of creeds—those parts of modern religious practice that most seem to make belief a necessary condition of religious affiliation, it is doubtful whether belief as such was ever at their origin. If it had been, there would have been a premium on insisting only on absolutely unambiguous beliefs, so that everyone would know what the question meant. Does the communion wine contain blood or only grape juice? Can the shaman levitate? Is the king able to cure scrofula? Will prayer bring rain? Though the Christian creeds contain some clear statements (albeit conveniently unverifiable ones such as those about the physical resurrection after death of the religion's founder), they also contain statements so abstract that individuals would have to decide whether they assented to them before having any idea what they meant. And that would have been precisely the point.

I have developed this example at some length because it provides the most favorable context for the claim that belief is a necessary part of religion. The presence of a written language in which theological assertions could be set out would have provided a powerful enforcement technology for the religious authorities, if indeed enforcement of belief as such had been an important pre-condition of religious membership. It does not, of course, follow that religious authorities in communities that lack written language would have no alternative technology for belief enforcement. In particular, the Parry-Lord hypothesis that the Homeric poems were constructed out of formulae that conformed to a particular metric structure and which could therefore be used for the repetitive reconstruction of a long sung poem over many recitals by the same or by different singers, described a technology for the preservation of oral traditions over long periods of time with a greater degree of copying fidelity than had hitherto been considered possible.⁹

However, if as I have suggested a written creed could have been used to enforce *assent* without necessarily enforcing *belief*, it follows that even a highly formulaic technology for the copying of spoken ritual elements would not have been able to enforce belief rather than merely assent. Demonstrations of agreement with the assertions of the leader might have been enforced rigorously—they would have marked out those members who could be relied upon to follow their leaders' instructions. But the assent would have been to group membership, not to any particular assertion with cognitive content. I am not aware of any credible ethnographic evidence of individuals' being denied membership or participation in any of the world's folk religions because of what they believed, as distinct from whose authority they were willing to accept.¹⁰

Once assent is granted, without belief in anything being a pre-condition, it becomes much easier to understand why counter-empirical beliefs become easier to swallow. There is by now a large anthropological and developmental literature documenting the human capacity for social learning¹¹ from figures of authority. These include parents and elder siblings but also adoptive authority figures in an individual's social group. It is mostly adaptive to believe what our elders tell us, even if our elders have some incentive to manipulate the detail of what they tell us in their own interest. If religious leaders become figures of authority before we believe anything they tell us, and if we believe what they tell us after they have acquired this role, the fact that this includes many counter-empirical notions is not difficult to explain. I elaborate on this point in section 5 below.

The importance of viewing counter-empirical beliefs as a likely by-product rather than a pre-condition of religion is that it is no longer necessary to show that the counter-empirical beliefs would have been adaptive in prehistoric societies. It's possible to be agnostic about precisely when in the development of religious belief and practice counter-empirical beliefs became a part of the story. The components of religion that were adaptive in prehistory could be the ones that made only weakly counter-empirical claims, or counter-empirical claims that had very few fitness costs. The more

strongly counter-empirical claims, or those whose counter-empirical character entailed higher individual fitness costs, could have come later.

Two important objections suggest themselves. The first is that even if counter-empirical beliefs had never been an *explicit* pre-condition of prehistoric religious practice, they might well have been an *implicit* pre-condition, because only if adherents believed in the efficacy of certain practices (shamanistic rituals, for example) would it have made sense to them to engage in the practices. These practices were often costly to the participants in various ways (costly to the shaman because of the physical ordeal involved, and costly to the other participants because they would typically be expected to compensate the shaman in some way).

This objection ignores two important facts about shamanism.¹² The first is that the ecstatic experiences of shamanism are often profoundly transformative—involve drugs, physical ordeals, noise, collective movement and contact—independently of any interpretation in terms of the spirit world. The appeal of participation may not therefore depend on the belief state of the participant.¹³ Secondly, even in communities where there is widespread respect for both the person of the shaman and the tradition he or she represents, shamans never have unconditional authority for whatever they choose to do or claim. A candidate for shamanhood is always subjected to critical scrutiny¹⁴—are their powers as great as they claim?—and so are the particular interventions that the shaman proposes—will the ritual work as effectively as has been promised? Skepticism is not a modern state of mind: it is an integral part of living in a community some of whose members claim privileges on account of their supposed access to unseen spiritual insight. Members of the shaman's community may be able to take part in the rituals at relatively low cost regardless of what they believe—paying a higher price may come with a more ambitious degree of belief, but basic admission to the world of shamanic ritual does not necessarily require a significant degree of counter-empirical commitment.

The second objection distinguishes between prehistoric religious practice among foragers and practice among early agricultural societies. The “Big Gods” hypothesis (Norenzayan, 2013; Norenzayan et al., 2014) asserts that once human societies became significantly large and hierarchical, ordinary small-group mechanisms for policing selfish behavior and overcoming free-riding would have been ineffective. There would have been too many people in a group for it to be feasible to observe who was abiding by group norms and who was not.

On this view, “Big Gods” were the solution: a psychological technology of internal surveillance, in the heads of potential free-riders, making them fear for the consequences if they tried to free ride. Even if individuals who were disinclined to believe in Big Gods might prosper by free riding with impunity, societies with Big Gods would out-compete societies without them, and so by arguments now familiar from multi-selection theory, belief in Big Gods would spread throughout the human population.

It's true that the Big Gods theory requires counter-empirical beliefs as a necessary condition for its evolution. But it's also true that this is a major weakness in the Big Gods theory.

Fortunately there is an alternative, which is that large-scale agricultural societies also had substantially enhanced surveillance techniques for free riders, precisely because they were also hierarchical. Not only was agriculture much more conducive to surveillance than foraging, which cannot be very effectively performed by people who are coerced. Agricultural societies also had overseers and slave-masters who could undertake the surveillance, rather than leaving it to the uncertain efficacy of neighborly enforcement.¹⁵

Such hierarchical societies could also dispose of techniques of mass spectacle to instill fear in their members, as has recently been persuasively shown for human sacrifice (Watts, Sheehan, Atkinson, Bulbulia, & Gray, 2016). It was not at all necessary for the spectators to believe that humans were being sacrificed to real gods to fear that they themselves might be next if they did not do as they were told. Of course, if you are afraid of your political leaders, and the political leaders give a plausible display of being afraid of some higher power than their own, you may come to believe that the existence of this higher power is pretty likely. But in either case, the fear of the political leaders would

have preceded the belief in the higher power and would in no way have been dependent upon it, a conclusion reinforced by recent comparative work across societies in the Pacific (Watts et al., 2015; Watts, Bulbulia, Gray, & Atkinson, 2016). In short, even for societies where Big Gods were important, we lack compelling evidence that counter-empirical beliefs were a precondition for religious affiliation rather than a likely by-product of it.

4. The cost of counter-empirical beliefs

It would be possible, but not very fruitful, to argue at length about whether the beliefs embedded in folk religion are not really counter-empirical by the standards of their communities, or indeed counter-empirical but perhaps not very startlingly so. What matters for understanding how the capacity to entertain such beliefs might have evolved is not how counter-empirical they are, but what fitness costs they may impose on their believers, relative to the fitness of other comparable individuals who do not subscribe to such beliefs.

I referred above to the argument by Kim Sterelny that small-world folk medicine is of very low adaptive efficacy, and therefore by implication that small-world folk-religion need only meet the modest bar of being no more maladaptive than folk medicine. The point in both cases is that in assessing the adaptiveness of small world folk beliefs of any kind, the relevant standard is that of plausible alternatives, not of modern secular beliefs in the relevant domain. Natural selection selects between local and not global alternatives.

In thinking about what that tells us about the pressures of natural selection on folk religion, therefore, we need to think about the local adaptive gradient—how do the various beliefs of folk religion compare, in terms of fitness costs and benefits, with locally available alternatives? The modern science of dreaming is not locally available to foragers, and treating dreams as a source of portents is unlikely to have significant fitness costs compared to alternatives that *are* locally available. If it makes individuals a little more willing to accept the claims of shamans than they objectively should be, that is unlikely to be devastating in fitness terms. Shamans rarely demand a share of the economic surplus anything like as large as that exacted by the rulers of stratified societies, and the latter have historically been able to back that demand with force. Likewise, believing that thunder represents the anger of the gods is unlikely to be costly in fitness terms, since the optimal response to thunder is not unlike the optimal response to anger—stay inside, out of sight. Only with modern housing, meteorology, and various other innovations, notably the growing importance of interactions with strangers, did the fitness value of distinguishing electromagnetic meteorological phenomena from human emotions come to make an important difference in the fitness space.

Similar considerations apply a fortiori to the costs of participating in religious rituals that are often accompanied by supernatural interpretations. Trevor Noah's memoir of growing up under apartheid in South Africa (Noah, 2016) contains amusing accounts of his mother's penchant for visiting multiple churches on a Sunday and of the young boy's increasing desperation as he realized that the lengthy service they had just sat through was not to be the last of the day. What the anecdote illustrates is that religious rituals can be enjoyable ways of passing leisure time for some, while being a tedious waste of time for others, and that in general individuals self-select into such activities according to their preferences. Those who spend a lot of time on religion are likely to be those who, relatively speaking, have a lot of spare time to spend. It seems just more likely that belief grows with participation, which is in turn influenced by many kinds of preferences, than that participation depends upon prior costly belief.

This leads naturally to the argument in section 5, which is that human beings are cognitively extravagant. In terms of the logic of this section, what this means is that developing elaborate and abstract theories is something in which we appear to find pleasure, and that is unlikely to have been maladaptive except in particular local circumstances even if the theories themselves were, by our modern standards, significantly counter-empirical. What exactly does this mean?

5. Cognitive extravagance

It is a commonplace that human beings have the capacity to engage in elaborate cognitive abilities that can have had no adaptive benefit to them during the overwhelming bulk of our genetic evolution. Probably the most incontrovertible example is reading, which although a skill that trained adults deploy effortlessly cannot possibly draw on neural competences that evolved through natural selection for that purpose, since reading as an activity is too recent in evolutionary history. Cecilia Heyes has recently argued that reading is just one of many cognitive skills that evolved through cultural rather than natural selection, and indeed uses reading as a motivating example to persuade us that other distinctively human skills such as “theory of mind” may be products of cultural evolution as well (Heyes, 2018).

Regardless of the power of this general argument, there is little dispute that the cognitive competences with which the human brain is endowed at birth permit the growing individual to develop in directions (such as a talent for advanced mathematics or the writing of sonnets) that exceed anything that would have been useful in a forager economy. This is not to say that such talents have no adaptive value (Miller, 2000, provides a broadly plausible account based on sexual selection). But it is not through an examination of the adaptive needs of foragers that we should expect to explain the character of these specific characteristics of human cognitive competences. It is in this sense that we can reasonably describe modern humans as having become “cognitively extravagant.”

Michael Tomasello (1999, 2019) has developed at length the theory that human culture is the product of a distinctive human capacity for imitation, and especially of “over-imitation” (the imitation of multiple features of the model’s behavior whose usefulness for fitness is not transparent to the observer). Over-imitation may be responsible for the easy transmissibility of elaborate ritual displays. It may also be responsible for the fascination with elaborate theories which, as we saw in the case of the Nicene creed, are often used as markers of identity. However, an additional and apparently very human talent that is not reducible to over-imitation, but which is likely to have reinforced the effect of over-imitation in the creation of elaborate and extravagant belief systems, is the creative suspension of disbelief. What do I mean by that?

It has become something of a commonplace that human societies involve a degree and sophistication of the capacity for trust in genetically unrelated individuals for which no real prototype exists elsewhere in the animal kingdom, but for social thinkers of earlier centuries the social insects provided a striking parallel for the complexity of human interactions.¹⁶ We know now that the social insects have a degree of genetic relatedness among individuals that suffices to ensure cooperation, while for unrelated humans a whole set of other competences need to come into play to ensure the construction of the elaborate levels of social trust on which modern societies depend. There has been a large literature on the determinants of social trust (Seabright, 2010), but in that literature one particular competence has received less attention than the others. It is the ability to believe in promises that are backed by no visible evidence.

The explosive growth in human brain size and complexity during our evolution from our common ancestor with chimps and bonobos did more than just give us the capacity to solve increasingly complex social and environmental problems. It also turned our brains into a marketplace for competing ideas about ourselves and our place in the world.¹⁷ In that marketplace, just as in the real marketplace where human beings had begun to develop complex systems of trade and cooperation, the key to success lay in the creative suspension of disbelief about the everyday evidence of our senses. The establishment of elaborate networks of cooperation with other unrelated individuals has required the ability to override the evidence of our immediate senses on a daily basis in the interests of distant and invisible objectives. We have to work out when we can afford to trust someone who has no intrinsic reason to help us, and who offers us nothing we can immediately use.

It is worth emphasizing that this capacity is much more sophisticated than just the ability to exchange items of value. Monkeys and apes typically trade with each other on the basis of immediate

advantages—but human beings are prepared to exchange on a daily basis on the basis of promises of future rewards they cannot see, taste or touch.¹⁸ This ability to suspend ordinary disbelief—in a structured rather than a purely whimsical fashion—is what enabled *Homo sapiens sapiens* to survive in the harsh conditions of the Upper Palaeolithic, spreading out from Africa to colonize a range of habitats quite different from those in which he first evolved. It then enabled him to adopt agriculture, settled in towns and cities, and found large and complex civilizations. It was what enabled the development of abstract constructions such as the modern limited liability corporation.¹⁹

This talent for suspending disbelief in the ordinary evidence of the senses also meant that human beings would be forever solicited by entrepreneurs with projects, secular or spiritual, that appeal to rewards beyond the perceptible horizon. Our talent and taste for social learning makes us ready targets for the solicitations of others. The ability to override ordinary sensual evidence is an intrinsic function of the healthy human brain, but it is also one that other human beings have learned to influence and manipulate, for good ends and bad. Such manipulation was already present in forager societies, and human beings appear to have become aware of the dangers of manipulation of their credulity from the earliest times. But modern societies offer opportunities for manipulation on a larger scale than any that existed in earlier times, and the challenges this poses for social trust are continually evolving.

6. Conclusion

In a nutshell, the answer to our first motivating question (“how did human beings come to believe in the existence of invisible spirits?”) is that counter-empirical beliefs of this kind have had few adaptive costs during the great part of our evolution. I have given reasons to think that counter-empirical beliefs were unimportant for religious participation for all of human prehistory and much of human history. I have also given reasons to think that such counter-empirical beliefs as were common in prehistory were not particularly maladaptive compared to locally available alternatives. Since the growth of modern hierarchical civilizations such counter-empirical beliefs have become much more elaborate and potentially much more costly compared to reasonable alternatives, because they are the product of a process of persuasive manipulation. Other people benefit from our willingness to suspend disbelief in the evidence of the senses, and they do all they can to encourage us in this direction. Sometimes they do so in pursuit of a shared benefit, and sometimes the benefit is all theirs; it is often hard for us to tell the difference.

The point about a facility for suspending disbelief is that it cannot be calibrated in advance to ensure it operates only in instances that deserve it. It will operate in response to cues, cues that can in principle be imitated and manipulated by others. Thus a willing suspender of disbelief will be both a readier collaborator in various economic projects, and a more frequent subscriber to extravagant cosmologies, if there are others around to propose them. A skeptic who wields Occam’s razor at every opportunity will rarely trust anybody, since the hypothesis that the world is full of thieves and charlatans is so much simpler and more elegant than the alternative that someone who has nothing to show you may nevertheless be someone you should trust. Yet the latter hypothesis, against all the odds, is sometimes really true, and it is on this fragile truth that all of modern civilization has been constructed.

Notes

1. Boyer (2001) and Atran (2002) are the two classic references, each covering a large amount of fascinating ethnographic material and demonstrating that religious beliefs, though counter-empirical, have a distinctive structure and character that are relevant to the evolution through natural selection of our capacity to accept them.
2. However, at one or two points Atran (2002) engages in some rather convoluted arguments on the subject of whether religious beliefs should be considered counter-empirical or not. On page 264 we read that “all human societies pay a price for religion’s material, emotional, and cognitive commitments to unintuitive, factually impossible worlds.” On page 267 he writes that “no statement or thought about the supernatural can ever

be empirically disconfirmed or logically disproven.” I can find no reasonable meaning of the former sentence that is compatible with any reasonable meaning of the latter.

3. A point stressed by Sterelny (2018). Among these are the beliefs that: the founder of the religion was born by parthenogenesis; that bread and wine become literally and not just metaphorically the flesh and blood of the religion’s founder under certain ritual conditions; that powerful spiritual beings will intervene in the world if and only if sufficient numbers of believers pray to request them to do so; that faithful members of the church will be physically resurrected after their death. These are all considered incredible by members of other religions. And they are just some of the beliefs of one modern religion among many.
4. For evidence on the thriving of religion in the 21st century world, as well as an account of the second and third answers about the costs of religion, see Auriol, Lassébie, Panin, Raiber, and Seabright (2019).
5. There is no implied claim here that modern science necessarily produces more accurate understand than other institutions that historically have influenced the development and propagation of beliefs. However, to the best of our knowledge, certain beliefs that are the product of the scientific method, such as the neuroscience of dreams, are indeed a more accurate representation of reality than, say, the belief that dreams are supernatural portents of the future.
6. MacCulloch (2009, pp. 211–222) provides a useful summary of the Arian controversy. He is more sympathetic than I am to the view that the contending parties really cared about the theological issues, though he admits that “it may seem baffling now that such apparently rarefied disputes could have aroused the sort of passion now largely confined to the aftermath of a football match” (p. 222). He goes on to write that

apart from the propensity of human beings to become irrationally tribal about the most obscure obscure matters ... ordinary Christians experienced their God through the Church’s liturgy in a devotional intensity which seized them in holy places. Once they had experience the divine in such particular settings, having absorbed one set of explanations about what the divine was, anything from outside which disrupted those explanations threatened their access to divine power. (ibid.)

Two things are problematic in this argument. One is the use of the word “irrationally”: he offers no reason why it might have been irrational for the participants in the Council to prefer strongly that the faction with which they were associated should emerge victorious from the Council, but in his account of the negotiations supplies many reasons why this would have been a very sensible preference to have. The second is that he does not explain why, if belief *per se* rather than a sense of belonging was what mattered for devotional intensity, individuals who had already experienced devotional intensity should have felt threatened by a compromise statement hammered out by a vast committee summarizing the beliefs of others.

7. A separate and no less interesting question is to what extent revising a scientific paper may also be like a piece of factional politics, trying to appease powerful referees and to avoid giving legitimacy to professional opponents.
8. See the entry “Nicene Creed” in *Wikipedia*, accessed 13 January 2019.
9. This was first set out in full detail in Lord (2000, first published 1960). An early assessment is by Pope (1963), and a later overview by Jensen (2017) suggests the theory has broadly held up well subject to some qualifications.
10. This is not to deny that beliefs have been an object of interest, even fascination, to members of many religions. But there is a difference between the true claim that members argue intensely about their beliefs, and the claim (which I deny) that the only individuals entitled to membership of a folk religion are those who share the beliefs of the religion’s authorities.
11. Boyd (2017), Henrich (2015) summarize this literature comprehensively.
12. Ones evident in such ethnographic surveys as that of Eliade (1964).
13. This does not show that belief is never necessary for participation in shamanistic ritual, only the weaker claim that we do not know to what extent belief is necessary. I am grateful to a referee for this point.
14. Boehm (1999) cites an incident among the Paliyans of India reported by Peter Gardner: “when men trying to exert leadership in a crisis were manipulatively invoking the gods, the rank and file mocked both the leaders and the gods they invoked” (p. 75); and also one among the Bihor of India when “members of a hunting party simply ignored the lead taken by an influential shaman who knew little about hunting” (p. 77).
15. See Seabright (2010), p. 273 and p. 340 note 7, for references to the near-ubiquity of slavery in large-scale agricultural societies.
16. Mandeville (1714) is the most obvious example.
17. See Seabright (2019) and Auriol et al. (2019) for detailed developments of this line of argument.
18. This statement needs to be qualified to the extent that there is now observational evidence of exchanges among chimpanzees that display “memory” (Gomes & Boesch, 2009, 2011). However, this does not significantly modify the arguments in this section.
19. Yuval Noah Harari has claimed that belief in religion is no harder to explain than belief in corporations, which is tendentious, to put it mildly (Harari, 2014); corporations as such may not be observable but they construct factories and office buildings, pay dividends and can be sued. Corporations do not claim to be more than the fruit of certain rules of economic and legal conduct and in particular do not claim to enable their members to

survive death. However, he is right that both religions and corporations involve a large degree of abstraction, and that this is in itself conducive to making such beliefs hard to refute.

Acknowledgements

I am grateful to Kim Sterelny not only for this commission but also for many stimulating conversations on this and related subjects over a number of years, to participants in the 2017 Evolution of Religion Workshop at the Australian National University for excellent comments, to the editor of this journal and an anonymous referee for clear and demanding revision requests, and to Amandine Belard for high-quality research assistance. I acknowledge IAST funding from the French National Research Agency (ANR) under the Investments for the Future (Investissements d'Avenir) program, grant ANR-17-EURE-0010.

Disclosure statement

No potential conflict of interest was reported by the author.

Funding

I acknowledge IAST funding from the French National Research Agency (ANR) under the Investments for the Future (Investissements d'Avenir) program [grant ANR-17-EURE-0010].

References

- Atran, S. (1998). Folk biology and the anthropology of science: Cognitive universals and cultural particulars. *Behavioral and Brain Sciences*, 21, 547–569. doi:10.1017/S0140525X98001277
- Atran, S. (2002). *In gods we trust: The evolutionary landscape of religion*. Oxford: Oxford University Press.
- Auriol, E., Lassébie, J., Panin, A., Raiber, E., & Seabright, P. (2019). Religious organizations as competing platforms. Working paper.
- Boehm, C. (1999). *Hierarchy in the forest. The evolution of egalitarian behavior*. Cambridge, MA: Harvard University Press.
- Boyd, R. (2017). *A different kind of animal*. Princeton, NJ: Princeton University Press.
- Boyer, P. (2001). *Religion explained: The evolutionary origins of religious thought*. New York: Basic Books.
- Dawkins, R. (1986). *The blind watchmaker*. New York: Norton and Company.
- Diamond, J. (1999). *Guns, germs and steel: The fates of human societies*. New York: W. W. Norton & Company.
- Eliade, M. (1964). *Shamanism: Archaic techniques of ecstasy*. Princeton, NJ: Princeton University Press.
- Gomes, C. M., & Boesch, C. (2009). Wild chimpanzees exchange meat for sex on a long-term basis. *PLoS One*, 4(4), e5116. doi:10.1371/journal.pone.0005116
- Gomes, C. M., & Boesch, C. (2011). Reciprocity and trades in wild West African chimpanzees. *Behavioral Ecology and Sociobiology*, 65, 2183. doi:10.1007/s00265-011-1227-x
- Harari, Y. N. (2014). *SAPIENS – A brief history of humankind*. New York: Random House.
- Henrich, J. (2015). *The secret of our success*. Princeton, NJ: Princeton University Press.
- Heyes, C. (2018). *Cognitive gadgets: The cultural evolution of thinking*. Cambridge, MA: Harvard University Press.
- Jensen, M. (2017). The challenge of oral epic to homeric scholarship. *Humanities*, 6, 97. doi:10.3390/h6040097
- Lord, A. B. (2000). *The singer of tales*, S. Mitchell & G. Nagy (Eds.) (2nd ed.). Cambridge: Harvard University Press.
- MacCulloch, D. (2009). *A history of christianity*. London: Penguin Books.
- Mandeville, B. (1714). The Fable of the Bees, or Private Vices, Publick Virtues. Text of 1932 edition downloadable. Retrieved from <https://oll.libertyfund.org/titles/mandeville-the-fable-of-the-bees-or-private-vices-publick-benefits-2-vols>
- Miller, G. (2000). *The mating mind: How sexual choice shaped the evolution of human nature*. New York: Anchor Books.
- Mithen, S. J. (1996). *The prehistory of the mind*. New York: Thames and Hudson.
- Noah, T. (2016). *Born a crime: Stories from a South African childhood*. London: John Murray.
- Norenzayan, A. (2013). *Big gods: How religion transformed cooperation and conflict*. Princeton, NJ: Princeton University Press.
- Norenzayan, A., Shariff, A. F., Gervais, W. M., Willard, A. K., McNamara, R. A., Slingerland, E., & Henrich, J. (2014). The cultural evolution of prosocial religions. *Behavioral and Brain Sciences*, 39(1), 1–19. doi:10.1017/S0140525X14001356
- Pope, M. W. M. (1963). The parry-lord theory of homeric composition. *Acta Classica*. Retrieved from <https://journals.co.za/docserver/fulltext/classic/6/1/768.pdf>

- Seabright, P. (2010). *The company of strangers: A natural history of economic life*. Princeton, NJ: Princeton University Press.
- Seabright, P. (2019). *The origins of enchantment: How religions compete*. Manuscript in preparation.
- Sterelny, K. (2007). SNAFUs: An evolutionary perspective. *Biological Theory*, 2(3), 317–328.
- Sterelny, K. (2018). Religion re-explained. *Religion, Brain and Behavior*, 8, 406–425. doi:10.1080/2153599X.2017.1323779
- Tomasello, M. (1999). *The cultural origins of human cognition*. Cambridge, MA: Harvard University Press.
- Tomasello, M. (2019). *Becoming human: A theory of ontogeny*. Cambridge, MA: Harvard University Press.
- Watts, J., Bulbulia, J., Gray, R. D., & Atkinson, Q. D. (2016). Clarity and causality needed in claims about big gods. *Behavioral and Brain Sciences*, 39, e27. doi:10.1017/S0140525X15000576
- Watts, J., Greenhill, S. J., Atkinson, Q. D., Currie, T. E., Bulbulia, J., & Gray, R. D. (2015). Broad supernatural punishment but not moralizing high gods precede the evolution of political complexity in Austronesia. *Proceedings of the Royal Society B: Biological Sciences*, 282. doi:10.1098/rspb.2014.2556
- Watts, J., Sheehan, O., Atkinson, Q. D., Bulbulia, J., & Gray, R. D. (2016). Ritual human sacrifice promoted and sustained the evolution of stratified societies. *Nature*, 532, 228–231. doi:10.1038/nature17159