

Between Religion and Science: Integrating Psychological and Philosophical Accounts of Explanatory Coexistence

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Abstract

Examining the relationship between religion and science has until recently been considered a philosophical exercise and, as a consequence, theories of how natural and supernatural explanations are related tend to be highly abstract and operate at the level of ideal rationality rather than in the psychological reality of actual believers. Although cognitive developmental psychologists have studied the topic of explanation quite extensively, until recently little has been known about how people interpret, accommodate, and reconcile natural and supernatural explanations in everyday life. We review psychological data from three core biological domains and provide an analysis of how philosophical and psychological accounts are complementary. We propose that emerging psychological accounts of the coexistence of natural and supernatural explanations may be developed further by adopting the conceptual resources provided by philosophers, especially with respect to the topics of explanation and possible relationships between science and religion. Furthermore, psychological data can inform philosophical accounts by providing information concerning how people reason about topics of fundamental concern to humans.

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Theologians and philosophers have long contemplated about how explanations about the divine and their actions relate to natural explanations based on scientific practices and everyday experience. The result has been a diverse set of philosophical theories that tend to be highly abstract and operate at the level of ideal rationality rather than in the reality of actual believers. Although psychologists are interested in the topic of explanation from a cognitive perspective [Keil, 2006; Wellman, 2011], until recently there has been little psychological data available of how people interpret,

accommodate, and reconcile natural and supernatural explanations in everyday life. Due in part to the emergence of the cognitive science of religion [Barrett, 2000, 2004; Boyer, 1994, 2001; Legare & Gelman, 2008; McCauley, 2000; Whitehouse, 2004] and related fields of cognitive anthropology [Sperber, 1996], this has begun to change.

By examining the mutually informative connections between philosophical and psychological perspectives we hope to motivate interdisciplinary research on explanatory coexistence. Our proposal is twofold: first, we suggest that this emerging cognitive psychological research on explanatory coexistence may be developed further by adopting some of the conceptual resources provided by philosophers of religion; second, we claim that the psychological research can also inform philosophical accounts of the religion and science dialogue by shedding light on how people reason about topics of fundamental concern.

We will begin by providing a brief overview of recent psychological studies on how both children and adults use natural and supernatural explanations with respect to several core domains of biological thought. We will then proceed to discuss the notion of explanation in natural and supernatural contexts and close with a discussion on different types of philosophical accounts of explanatory coexistence and how they relate to psychological research on this topic.

Psychological Accounts of the Coexistence of Natural and Supernatural Explanations

Although a well-established and influential body of research exists on the development of explanatory reasoning in natural domains [Frazier, Gelman, & Wellman, 2009; Gopnik & Schulz, 2007; Keil, 2006; Legare, Gelman, & Wellman, 2010; Legare, Wellman, & Gelman, 2009; Wellman, 2011; Wellman & Gelman, 1992], there has been much less systematic research on the development of explanation based on supernatural or divine powers from a psychological perspective [but see recent findings by Astuti & Harris, 2008; Barrett, 2000; Evans, 2001; Harris & Koenig, 2006; Legare & Gelman, 2008; Rosengren, Johnson, & Harris, 2000]. In particular, investigators have rarely asked whether, and more importantly, *how* religious and scientific explanations coexist in the minds of children and adults [but see Evans, Legare, & Rosengren, 2011; Evans, Rosengren, & Harris, in press].

Legare et al. [under review] have recently reviewed psychological studies on explanatory coexistence in three different domains: origin of species, the causes of illness, and the nature of death. They claim that these are fruitful domains for studying the coexistence of natural and supernatural explanations for several reasons. First, both natural and supernatural explanations for phenomena in these domains are prevalent across cultures. As a consequence, it is quite common that individuals have access to both kinds of explanations for phenomena in these domains. Second, these domains are associated with strong emotions and existential anxieties. Questions about origins concern how we understand ourselves and our relationship to the rest of the natural world; illness and death concern feelings of loss and mortality. Finally, investigating explanatory coexistence in these domains is informative because it requires invoking causes that are outside our everyday experience. Whether it be the supernatural influence of a witch or the work of a microorganism such as a virus, the workings of these hidden factors are invisible to the people involved.

Converging developmental data from diverse cultural contexts strongly suggests that natural explanations involving natural or scientific causes and supernatural explanations involving divine or religious causes are used by the same individuals to interpret the same to-be-explained phenomena. Further, Legare et al. [in press] proposed that people have three different ways of using these explanations to explain the same phenomenon that vary in the degree to which they are integrated: *target-dependent thinking*, *synthetic thinking*, and *integrated thinking*.

Target-Dependent Thinking

In target-dependent thinking, natural and supernatural explanations remain relatively distinct but are used to explain different aspects of a given phenomenon, depending on the particular mode of response or kind of causal attribution. In response to a request for an explanation for a single event, two kinds of explanations are proposed and applied to distinct aspects of the event.

The analysis of death concepts in Spain, Mexico, and Madagascar provide evidence for the use of target-dependent thinking. Cross-cultural and developmental data indicate that both children and adults endorse biological and religious conceptions of death [Astuti & Harris, 2008; Harris & Giménez, 2005] and are sensitive to contextual information and the narrative context in their explanatory attributions when doing so. For example, when presented with a narrative highlighting the biological aspects of death (e.g., the unsuccessful efforts of doctors to save a dead person), both children and adults are likely to assert that living functions, and particularly bodily functions, have ceased. In contrast, when presented with a narrative highlighting the spiritual aspects of death (e.g., a religious figure or ceremony), respondents are likely to assert that living functions, and particularly spiritual or mental functions, continue.

Similarly, in the case of reasoning about origins, target-dependent thinking is evident when an evolutionary framework is recruited to explain the origin of nonhuman species whereas a theistic framework is recruited to explain the creation of human beings. In a Gallup Poll [2007], 24% of the United States public endorsed the idea that 'humans evolved from earlier forms of life' and 'that humans were created in their present form ... within the past 10,000 years.' One way to address this ambiguity is to claim that whereas other biological species evolved, humans were created. This claim, being somewhat close to what is usually called progressive creationism or 'old earth creationism,' is shared by about 30% of adolescents and adults in the United States [Evans, 2000, 2001]. Moreover, explanations of evolutionary origins are more likely to be assigned to animals that are taxonomically distant from humans [Evans, 2008].

In the domain of serious illness, target-dependent thinking is evident in sensitivity to contextual information. For example, in research on the coexistence of biological and witchcraft explanations for AIDS in South Africa, when information about supernatural risk factors was present (e.g., witchcraft attack), more supernatural than natural explanations were provided. Conversely, when biological risk factors were present, the opposite pattern was found [Legare & Gelman, 2008].

Synthetic Thinking

In synthetic thinking, natural and supernatural explanations are used in a dual fashion to explain the same aspects of a given phenomenon [Vosniadou, Vamvakoussi, & Skopeliti, 2008]. Two different causes may be combined into a single explanation. These combined explanations involve a loose integration of natural and supernatural causes, but without detailed consideration of how they would interact.

In the domain of serious illness, synthetic reasoning accommodates multiple explanatory systems, though not in a clearly integrated manner (i.e., it is not clear what role each domain plays). Research in a variety of different cultural contexts has demonstrated that both biological and supernatural explanations are recruited to explain illness. For example, research with Euro-American, Vietnamese-American [Nguyen & Rosengren, 2004], South African [Legare & Gelman, 2008], and Indian populations [Raman & Gelman, 2004] has shown that individuals reason about illness using a mixture of biological and magical or supernatural causes of illness. The results suggest, and Legare et al. [in press] claim, that although biological causality is the dominant form of reasoning about illness across the different ages and cultural groups, supernatural causes are also invoked across diverse age and cultural groups.

Integrated Thinking

Finally, Legare et al. [in press] proposed another kind of thinking that is more integrated than target-dependent or synthetic thinking because it incorporates natural and supernatural explanations into one single explanation. *Integrated thinking* is characterized by the explicit reconciliation and integration of natural and supernatural explanations by using different types of explanations for different levels of explanation.

One of the ways individuals reconcile natural and supernatural explanations for the origins of species is to integrate these explanations into a single causal chain, as in theistic evolution [Evans, 2008]. In this model, common among nonfundamentalist theologians [Scott, 2004], God becomes the distal or final cause of evolutionary change by setting up the natural laws that are designed to produce life eventually. This contrasts with the creationist account in which God directly creates the original species found on earth. In the domain of serious illness, there is a similar pattern: the proximate cause is identified as a biological risk factor (e.g., unprotected sex), whereas the final cause is believed to be supernatural (e.g., witchcraft; witches are believed to be capable of distorting one's sense of good judgment or putting an AIDS-infected person in one's path).

Contextual Factors and Individual Differences

The ways in which people use natural and supernatural explanations are quite flexible and context sensitive. Legare et al. [in press] suggested that people engage in all three kinds of coexistence thinking (i.e., target-dependent, synthetic, and integrated) depending on the context: contextual information, cultural input, and the difficulty of reconciling both kinds of explanations influence the interpretive frame

of a particular event and subsequent attempts to achieve explanatory coherence. Moreover, they argued that access to multiple explanatory frameworks is a universal psychological experience, and resolving conflicts between multiple explanatory systems is a general cognitive challenge. Their claim is that age and experience coupled with language and contextual influences operate at a relatively global level to influence the normative reasoning patterns within particular groups or cultures.

Legare et al. [in press] also speculated about why an individual might engage in one or the other of the previous three kinds of coexistence thinking. One possibility is that some kinds of coexistence thinking may require more cognitive effort to reconcile views that seem to be in direct competition or even incompatible. For both children and adults, they suggested that perceived conflicts or tensions between explanatory systems might trigger the effort to create a more coherent and integrated belief system. But even in these cases, the kinds of explanations used are clearly dependent upon what an individual is exposed to in his or her family of origin and broader culture.

The psychological data do not support the claim that, when available, natural or scientific explanations replace supernatural or religious ones. Instead, Legare et al. [under review] concluded that increases in knowledge, education, and technology do not inevitably lead to the replacement of supernatural explanatory systems. They concluded that (a) instead of abandoning supernatural explanations in situations of conflict with scientific or natural explanations, people find ways to accommodate supernatural explanations by sometimes integrating and sometimes separating them from natural explanations, and that (b) supernatural reasoning seems to be a general feature of human cognition.

There are numerous questions and issues of a theoretical or conceptual nature that one could address concerning the studies just described. First, one of the implications of these studies is that people combine natural and supernatural explanations in a number of intriguing ways. This raises the more general question of how explanations of different kinds are related to one another. To address this, we introduce (briefly) some distinctions that make a more detailed classification of explanations possible. The second issue we will address is the question of how the psychological data about different types of reasoning relate to philosophical categories of possible relationships between religion and science. We examine this issue by discussing several different philosophical models on this topic, which distinguish different types of explanatory coexistence. In the next section, we will focus on the former issue and subsequent sections are reserved for the latter.

The Structure of Explanations

This section raises questions about the ways in which psychological studies conceptualize religious and scientific explanations and will provide a more detailed way of understanding explanations. The way that we discuss natural and supernatural explanations implies that we conceptualize religion and science in this article as sets or systems of beliefs. This is indeed the case, but we will openly acknowledge that there are many aspects of science and religion that do fit into our framework: religion and science can be seen, for example, as shared practices of certain communities or ways of achieving certain kinds of knowledge.

Generally speaking, we should be careful when labeling beliefs as simply natural as opposed to supernatural or scientific as opposed to religious. Notably, we do not have access to universally agreed upon definitions for ‘natural’ and ‘supernatural’ any more than we have watertight definitions for the categories of ‘science’ and ‘religion.’ Although multiple definitions for natural and supernatural have been proposed, for the present purposes, we accept the following somewhat simplified definitions. Natural explanations refer to entities and relations that are confined to ‘the spatiotemporal universe of physical entities together with any entities that are ontologically or causally reducible to those entities’ [Draper, 2005, p. 278]. Conversely, supernatural explanations invoke entities and relations that are outside the natural world, have influence or produce effects in the natural world and cannot be seen, discovered or inferred by scientific methods [Flanagan, 2006]. It follows from these definitions that scientific explanation is a subcategory of natural explanation whereas religious explanation is a subcategory of supernatural explanation. Furthermore, these definitions allow us to map philosophical typologies of the relationship between science and religion onto the psychological typologies of different relationships between natural and supernatural explanations. As we pointed out in the previous section, the psychological data suggest that people combine natural and supernatural explanations in different ways from separation to close integration. In what follows, we will suggest that beliefs about causes are highly complex and that when reasoning about natural and supernatural explanations people readily exploit this.

We approach this issue by asserting that both natural and supernatural explanations can be understood as answers to questions. Usually these questions pertain to how something was possible, how it happened or why it happened. Moreover, such questions are normally answered by presenting a cause, a set of causes, or a causal mechanism of some sort [Garfinkel, 1981; van Fraassen, 1980]. We understand causes in this context in a very broad way including intentional states (such as beliefs and desires) and actions and behaviors of natural and supernatural entities. The distinction between intentional and nonintentional explanations is important and we will return to this later. What we want to claim here is that we can understand explanations as beliefs about causes of things. Explanations can be beliefs about how things work in general, what caused one single event, or what kinds of causes different event types in general have. Explanations such as these are crucial for human beings: they help us figure out what to do and how to navigate and control the world.

Explanations in general are not easily related to one another because they have implicit connections to other beliefs and their interpretation depends strongly on the context and prior knowledge. So what kinds of components do explanations normally have? With respect to any given explanation, we can ask the following questions: (a) What is being explained (*explanandum*)? (b) What is the explanation (*explanans*)? (c) What is the way in which the *explanans* explains the *explanandum*? We can see from these questions that an explanation consists of two parts: there is the *explanans*, that which explains, and the *explanandum*, that which is explained. There is also the relationship between the two, which provides us with the connection between the *explanandum* and the *explanans*.

Each component of an explanation can be conceptualized in different ways. Both the *explanandum* and *explanans* might be a single event, an event type, a dis-

position or a general tendency. In cases in which both explanandum and explanans are events, it is normal to talk about singular causal explanations. Scientific explanations, however, are rarely like this; rather they make claims about different event types ('X types of food cause cancer') or causal mechanisms ('the vase broke when I dropped it because its physical structure is Y'). Finally, the ways in which the explanandum might explain the explanans are diverse. There might be a uniform (law-like) connection between two singular events across different contexts (which is the ideal many physical scientists aim to achieve) or the connection could be probabilistic or statistical as in the previous example of some types of foods causing cancer. Recently, philosophers of science and psychology have also proposed highly developed forms of constitutive and mechanistic explanations [e.g., Craver, 2007; Cummins, 2000].

This highlights the fact that explanations are closely linked to beliefs about the nature of the explanans and explanandum. Any given explanation only explains its explanandum under a certain description. Another way of putting this is to say that the explanandum is not a simple object at all. Many philosophers who have made this argument [e.g., Garfinkel, 1981; Hitchcock, 1996; van Fraassen, 1980; Woodward, 2003] have pointed out that when we explain things we conceptualize the explanandum phenomenon with respect to different alternatives or contrasts. The problem is that these conceptualizations are usually implicit rather than explicit, which makes relating beliefs and causes difficult.

Consider the following famous example [Garfinkel, 1981]. The bank robber named Willie Sutton was serving time in prison and the prison chaplain, with the intention of reforming him, asked him why he robbed banks. Sutton replied: 'That's where the money is.' The chaplain was not pleased with this answer, because he was asking about something else. What was it? The chaplain and Sutton want an answer to a linguistically identical question but what they are actually explaining is quite different. The prison chaplain wants to explain why Sutton robs in general, whereas for Sutton the issue is why banks are better places to rob than some other places. When these implicit contrasts are made explicit, different aspects of the explanandum phenomenon arise and two explanations that might otherwise look the same turn out to be explaining different things. If we believe that Sutton robs banks because that is where the money is and you believe that Sutton robs banks because he makes poor life choices, we are both right. Simply put, our explanations neither support nor undermine each other because they have a different explanandum.

The previous analysis of how explanations work sheds light on the findings of Legare et al. [in press]. The coexistence of seemingly similar natural and supernatural explanations is made possible by the fact that in the minds of individuals they have different contrasts. With different contrasts in mind, one can say that illness is caused by a viral infection and witchcraft at the same time: viral infection explains how it happened (with respect to causal mechanism) whereas witchcraft explains why it happened to you instead of someone else or why it happened to you now rather than some other time. This interpretation is in line with the results of Legare et al. [in press] who drew attention to the flexibility of supernatural and natural explanations. Different contexts and priming might influence the kinds of explanations that people give in particular situations by changing the implicit contrasts that people have in mind.

Types of Coexistence: A Philosophical Perspective

In this section, we consider how the psychological data on different types of coexistence thinking relate to philosophical categories of potential relationships between scientific and religious explanations. We examine this issue by introducing several different philosophical models that distinguish different types of explanatory coexistence.

Before we proceed, we should note that we are now moving from psychological into philosophical territory. Empirical approaches (such as the psychological studies described earlier) and philosophical approaches to the issue of coexistence are different in one very important respect: empirical approaches focus on how people actually reason whereas philosophical approaches are concerned with how people should reason in order to be rational.

In other words, empirical approaches seek to describe and explain why people reason about supernatural and natural explanations as they do; philosophical approaches examine how people should reason about these things and bring in normative components, such as different theories of what rationality consists of. This is an important distinction because the following types of possible relationships between science and religion include normative and not just descriptive components.

In recent philosophical and theological literature, one can find multiple ways of relating science and religion to each other. The starting point is usually the fourfold typology of Ian Barbour [1972, 1998]. According to Barbour, there are four types of science and religion relationships: (a) total conflict, (b) independence, (c) dialogue, and (d) integration. This typology is useful because it is intuitively appealing. The idea is that science and religion are two independent belief systems that can be either in conflict, totally independent of each other, in dialogue with each other but remaining relatively autonomous or fully integrated into one explanatory system.

Based on the criticisms of Barbour's typology [e.g., Haught, 1995; Stenmark, 2004], we follow Stenmark's [2004, 2010] simplified typology: (a) total conflict, (b) independence, and (c) reconciliation. The reconciliation model has several subtypes depending on the object and strength of reconciliation (i.e., conservative, traditional, liberal and constructivist reconciliation).

Total Conflict

The total conflict model claims that the coexistence of religious and scientific explanations is not possible; according to this model, there is an irreconcilable chasm between science and religion. Religion and science are comprehensive and conflicting explanatory systems competing for the same explanatory territory. Not only is there almost complete overlap of content, but the contents of religious and scientific beliefs are contradictory to the extent that religious and scientific beliefs can only be held at the same time on the threat of irrationality. If one wants to remain rational, one must always choose between a religious and a scientific set of beliefs [e.g., Dawkins, 2006; Dennett, 1995, 2006; Wilson, 1998]. However, it is important to note the strong assumption underlying the total conflict model. It assumes that scientific beliefs and religious beliefs are about the same things, that is, they represent the same phenomena but in contradictory ways. If this were not so, talking about irreconcil-

ability would make little sense; if religious beliefs and scientific beliefs represented different parts or aspects of the world, their content would not overlap and thus there would be no conflict.

It is clear that the psychological data described earlier do not support the total conflict model as a description of what typically happens at the level of individual psychology. People rarely consider natural and supernatural beliefs as mutually exclusive. However, this is not a logical argument against the total conflict model. We have already introduced the difference between normative and descriptive approaches. It suggests that if the total conflict model were accurate, then it would follow that human beings reason in ways that are suboptimal from a rational perspective. All attempts to reconcile natural and supernatural explanations will inevitably fail, because coexistence is not possible from a rational perspective. The psychological data also highlight the practical difficulty of the total conflict model. If supernatural reasoning is a fundamental part of human cognition, then upholding the total conflict model requires considerable reflective cognitive effort. This makes the total conflict model (and subsequent atheism) difficult to transmit and learn – a claim already made by Justin Barrett [2004].

Independence

The independence model is the opposite of the total conflict model and claims that religious and scientific beliefs can coexist because they are in principle different: they address different things in different ways and have no logical consequences with respect to one another. Arguments for the independence model can be made in many different ways. One can argue, for instance, that scientific explanations deal with the perceived physical world whereas religious explanations are about something beyond any possible shared experiences, such as the value or the meaning of the cosmos, the transcendent God, or private and existentially meaningful experiences [e.g., Phillips, 2008]. Similarly, some argue that religious explanations are not explanations that should be understood in any kind of causal or scientific terms. Instead, religious ‘explanations’ address the meaning and value of things [e.g., Gould, 1999]. Finally, many have claimed that religious beliefs serve a different function in people’s lives than scientific ones: scientific and natural explanations help us to control and understand the natural and physical world whereas religious beliefs help us to deal with existential anxieties [Lindbeck, 1984].

Although one might first think that the results of Legare et al. [in press] point towards the independence model, this is not necessarily the case. Their data provided compelling evidence that people often integrate natural and supernatural explanations to explain the same event as in the case of integrated thinking. Additionally, people often assume that supernatural entities and forces causally bring about events in the natural world instead of ‘explaining’ their value or meaning as the independence model suggests. In cases of perceived conflict, for example, a conflict between claims about natural and supernatural causes of illness, the advocate of the independence model would claim that the conflict is only an illusion. Supernatural explanations of illness do not explain illness in a causal way, but rather they address its meaning for human life. But, as the psychological data indicated, this does not capture many of the ways in which people reason. Instead,

people appear to modify the explanandum or adjust the way in which supernatural causes explain their effects in order to keep supernatural explanations causal. Meaning and value might, therefore, be a by-product of supernatural explanations, but people do in fact often understand religious explanations as causal explanations that can, in principle, be used in the same capacity as natural ones. To put the point in more philosophical terms, people hold onto a realist interpretation of religious claims and explanations; the supernatural does not just give meaning or value to the natural world, but can have genuine causal effects. Although the psychological data do not rule out the use of an independence model to reason about natural and supernatural explanations, it is clear that they do not support the independence model exclusively.

Reconciliation

We have examined how both the total conflict model and the independence model receive little support from psychological data. What we want to suggest in this section is that the third philosophical model, the reconciliation model, fits well with the psychological data. According to this model, religion and science can overlap to some extent but nevertheless coexist; religion and science are neither totally independent of each other (as the independence model suggests) nor are they necessarily in irreconcilable conflict as the total conflict model claims. Instead, there are areas of overlap. Philosophical models range from almost complete overlap and integration to overlap in relatively marginal areas. In areas of overlap, there can be harmony or conflict. If there is harmony, scientific and religious beliefs in that area complement each other. If there is conflict, either scientific or religious beliefs (or both) must be revised. The second point reveals why there are two subtypes of the reconciliation model: when science and religion overlap, in addition to the possibility of conflict, there is a possibility of harmony and mutual support. Therefore, we must distinguish between *supportive reconciliation* and *reformative reconciliation*. It is good to remember the possibility of supportive reconciliation since the coexistence of religion and science is often conceptualized primarily as a lack of conflict. Supportive reconciliation can take the shape of confirmation and support (when scientific claims provide evidence for religious claims or vice versa) or harmony (when scientific claims and religious claims say the same thing or vice versa). For our purposes, we will not elaborate on the supportive reconciliation model and focus instead on the reformative reconciliation model, because it addresses issues similar to the ways of thinking discussed by Legare et al. [in press]. Those who endorse ideas related to the reformative reconciliation model suggest different ways of dealing with conflicts in areas of overlap. There are at least four versions of reformative reconciliation depending on the strength and object of reformation.

According to *conservative reconciliation*, religious beliefs are always given priority when a conflict arises with scientific or natural explanations. This view, exemplified by many creationists, does not entail the rejection of scientific beliefs in general, but rather their reformulation on the basis of religious beliefs if a conflict should arise. In the case of the origins of species, the creationist claim is that scientific beliefs about this topic are wrong and need to be revised. In other words, the conservative

reformer holds religious beliefs approximately true and trustworthy and not subject to reinterpretation, whereas conflicting scientific beliefs are subjected to reinterpretation. Notice, however, that the creationist is not an advocate of the total conflict model: there is (in principle) no conflict between religion and science and thus religion should not replace science.

This point highlights the fact that supernatural beliefs are almost always mixed with natural and scientific explanations. Natural and supernatural beliefs are not completely separate 'systems' of beliefs at the level of individual psychology. This is the reason why we should not be surprised about the fact of explanatory coexistence among creationists or other fundamentalists: they do not (typically) propose that God directly explains everything. Coexistence is controversial only if we (implicitly) assume that the total conflict model is true.

Target-dependent thinking is consistent with conservative reconciliation. By separating the explanandum of natural and supernatural explanations, religious explanations can operate as genuine causal explanations without any fear that the existence or nature of supernatural entities is threatened. Synthetic thinking is also compatible with conservative reconciliation. In synthetic thinking, a person reconciles natural and supernatural explanations by adding additional beliefs about the 'mysteriousness' or intractability of supernatural causes.

According to *traditional reconciliation*, in situations of conflict or tension religious beliefs can indeed be reinterpreted to some extent, but not deeply. For the traditionalist, both religious and scientific belief systems will maintain their core beliefs, but it is possible and sometimes necessary to reformulate or reinterpret either one (or both). Many scientist-theologians [e.g., McGrath, 2006, 2009; Polkinghorne, 1998, 2008] and philosophers [e.g., Swinburne, 2004] argue along these lines and defend highly integrated forms of reconciliation (e.g., theistic evolution with respect to biological origins and physical fine-tuning as its basis). There is also the possibility of prioritizing natural and scientific explanations over religious explanations, which we call *liberal reconciliation*. For the liberal reformer, the starting point is always the given set of scientific beliefs. In his view, it is religion that has to accommodate scientific beliefs rather than vice versa – an attitude that might lead the proponents of this model to depart strongly from traditional interpretations of religious belief systems [e.g., Kauffman, 2004; Peacocke, 2004].

What Legare et al. [in press] called integrated reasoning comes very close to both traditional and liberal reconciliation (depending on what is being prioritized). In integrated reasoning, the subjects attempt to find a way to revise their scientific and religious beliefs in such a way that no conflict in a given topic emerges. Further, the integrated thinkers can attach their religious and scientific explanations to a larger set of beliefs of how their religious claims are reconciled with their scientific and natural claims, such as in the case of theistic evolution.

Finally, there is an extreme form of reconciliation that seeks to reformulate or at least radically reinterpret both traditional religion and modern science. According to this *constructivist reconciliation* that takes its inspiration from deconstructivist and postmodern philosophies, both religious and scientific explanations need to be understood as radically human constructs. Both science and religion are attempts to further the interests and exhibit only the will to power of some particular social group [e.g., Cupitt, 1986]. Some representatives of this approach go even further and claim that even the world itself is a human creation so there is no truth to be had.

Nor is there any rationality: we have no reasons to prefer some way of forming and giving evidence to beliefs over another with respect to their ability to reach truth. Strong forms of this model merge with the independence model as both claim that after the radical reinterpretation of the notions of 'truth' and 'rationality' there is no point in talking about possible conflict or harmony. The psychological data suggest, however, that this type of reconciliation is rare, possibly because of the highly counterintuitive scepticism involved.

We propose that the psychological data on the coexistence of natural and supernatural explanations primarily support the conservative reconciliation model or the traditional and liberal models. Target-dependent and synthetic thinking are consistent with the conservative reconciliation model whereas integrated thinking is consistent with either the traditional or liberal reconciliation models.

Conclusions and Recommendations

Based on this review, we would like to draw several conclusions and provide some recommendations. First, the topic of rationality is important to consider when discussing the relationship between psychological and philosophical accounts of explanatory coexistence. Although a discussion about the rationality of the philosophical models reviewed is outside the scope of this article, we acknowledge that the relationship between normative assessment and psychological realities is complex. The data reviewed by Legare et al. [in press] strongly support the claim that explanatory coexistence is an empirically verifiable state of affairs; people hold supernatural and natural explanations for the same explanandum at the same time. Additionally, supernatural reasoning seems to be a stable feature of human cognition [McCauley, in press] and difficult to avoid or separate from natural and scientific reasoning. However, from this we cannot simply conclude that coexistence is rational or warranted. Various philosophical views are possible regardless of the psychological fact of explanatory coexistence.

Second, we propose that one of the most characteristic features of religious explanations is that they are given in intentional terms. Contrary to scientific explanations that tend to conceptualize the explanandum and the explanans in terms identifiable by theories of natural sciences, religious explanations posit the intentional actions of supernatural agents as causes of events [for overviews, see Saunders, 2002; Ward, 2007]. Generally speaking, supernatural agent explanation is a subcategory of intentional explanation. The basic form of such explanations allows us to explain certain outcomes as the effects of agents' intentional (mental) states such as desires and beliefs. This pattern of explanation is at work in both supernatural and natural cases. Supernatural entities are conceptualized as agents that act on the basis of their knowledge and aims.

Although intentional explanations have causal and intentional components, their exact relationship is difficult to spell out. Thus, whenever we consider intentional explanations, we are stuck between two intuitions: on the one hand, agents seem to initiate new causal chains in the natural world, but, on the other hand, we find it difficult to see how these causal chains are related to the mechanical workings of nature.

This has led some philosophers to make a strong distinction between personal (intentional) explanations that invoke intentional states as explanans and scientific explanations that invoke physical forces and regularities. Furthermore, some philosophers defend the independence of intentional explanations against scientific ones for different reasons; for example, Swinburne [2004] defended personal explanation as dualist whereas Horgan and Woodward [1985] defended it as materialists and folk-psychological realists. Conversely, some strongly naturalist philosophers have argued that intentional explanations should either be amenable to reduction to scientific explanations or be eliminated completely [Churchland, 1988].

Although these concerns are distinctively philosophical, they nevertheless have consequences for how we conceptualize the relationship between supernatural and natural explanations. Our point here is not that psychological studies should produce or assume one particular solution to these philosophical problems. Instead, we propose that when empirical research is conducted, philosophical questions loom in the background and should influence how the studies are designed and interpreted. It is useful to make these assumptions as transparent as possible.

Finally, we suggest that psychological accounts of the coexistence of supernatural and natural explanations may be developed further by adopting some of the conceptual resources provided by philosophers of religion, and conversely, that philosophical accounts of religion and science can be informed by psychological data on how people reason about these topics. Overly reductionist interpretations of psychological results can be avoided by examining the philosophical work on the pragmatics of explanation in each of these domains. Philosophical accounts that focus on the utility of different kinds of explanations as answers to different kinds of questions suggest that further psychological research into the contextual factors that influence the implicit contrasts that people adopt in particular situations would be informative. We also suggest that more attention needs to be directed towards the role of intentionality in supernatural explanation. By contrasting supernatural explanations with physical explanations, one sets up only one particular kind of contrast; instead, it may be more useful to examine supernatural explanations for similarities with everyday folk psychological explanations.

From a psychological perspective, we propose that the total conflict model, the independence model, and the constructivist version of the reconciliation model are not supported by the psychological data. On the one hand, the total conflict model forces its adherents to give up supernatural explanations altogether, which is incompatible with the widespread belief that supernatural explanations answer questions that natural explanations do not answer. On the other hand, the independence model assumes that supernatural explanations are not causal, but that supernatural explanations provide meaning and value. In contrast to this, we propose that many people understand supernatural explanations as genuinely causal explanations (even if they do not have access to the causal mechanisms involved). Finally, the constructivist reconciliation model goes against our intuitions about the existence of the physical world, making it difficult to conceptualize for most people. We propose that the conservative, traditional, and liberal reconciliation models best map onto the types of thinking identified in the psychological research. This suggests that philosophical and theological models along these lines would be perceived to be the most intuitively plausible from a psychological perspective.

Philosophical theories on the religion and science dialogue would also benefit from the psychological data on this topic; information about how people actually reason about the relationship between religious and scientific explanations can inform philosophical work in a number of ways [for an overview, see Lawson, 2005]. Psychological data can inform philosophical theory about what is plausible from the point of view of our everyday intuitions. For example, we propose that some philosophical models of the relationship between religion and science are unrepresentative of human cognition on this topic and thus unlikely to be widely distributed without considerable cultural scaffolding.

By examining the mutually informative connections between philosophical and psychological accounts of the coexistence of natural and supernatural explanations, we hope to inspire interdisciplinary research on this topic. We propose that emerging psychological accounts of the coexistence of natural and supernatural explanations may be developed further by adopting the conceptual resources provided by philosophers, especially with respect to the topics of explanation and possible theoretical relationships between science and religion. Furthermore, psychological data can inform philosophical accounts by providing information concerning how people reason about this fundamental topic in human cognition.

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