Reduction, Explanation, and the New Science of Religion

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Abstract In this essay, we set out to survey and critically assess various attitudes and understandings of reductionism as it appears in discussions regarding the scientific study of religion. Our objective in the essay is twofold. First, we articulate what we will refer to as three 'meta-interpretative' frameworks, which summarize the distinct positions one can witness in response to the explanations coming out of research within the new science of religion. Second, and more importantly, we seek to demonstrate that under no sensible interpretation of the notion of 'reduction' do the explanations provide a basis for defending one of the meta-interpretative frameworks rather than another.

Introduction

The scientific study of religion has transformed itself rather dramatically over the last few decades. In addition to traditional anthropological and archeological studies of religion, increasingly the scientific basis for investigations of religion comes in the form of contemporary psychology and evolutionary biology. Arguably, the most prominent branch of this new science of religion may well be the so-called cognitive science of religion (CSR) program (e.g., Barrett 2004; Boyer 2002). A cursory survey of the new science of religion reveals a great deal of diversity in the fundamental matters of objectives, theoretical assumptions, and methodology. Nevertheless, these recent approaches to the study of religion do display a common commitment to the possibility of explaining religious phenomena (e.g., belief, experience, and practice). And while there has been no shortage of attempts to explain religion previously (e.g., Freud),[1] the sophistication with which the new science of religion approaches the project of

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[1]Much has been written about the history of explanation in religious studies. For more on the subject, see Preus (1987).

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explaining religion might be seen as especially significant for religion's defenders and opponents alike.

The potential success of an empirically and theoretically respectable scientific explanation of religious phenomena can, and has, incited a host of reactions from both religion's opponents and its defenders. Furthermore, many of these reactions rest on substantive presuppositions regarding the notion of 'reduction' and its relationship to scientific explanation. In this essay, we set out to survey and critically assess these various attitudes and understandings of reductionism. Our objective in the essay is twofold. First, we articulate what we will refer to as three 'meta-interpretative' frameworks, which summarize the distinct positions one can witness in response to the explanations coming out of research within the new science of religion. Second, and more importantly, we seek to demonstrate that under no sensible interpretation of the notion of reduction do the explanations provide a basis for defending one of the meta-interpretative frameworks rather than another.

A Sample Explanation from CSR

Our critical examination proceeds by first laying out a representative explanation from CSR. Broadly put, CSR investigators such as Justin Barrett (2004), Pascal Boyer (2002), and Todd Tremlin (2010) emphasize the significance distinct mental modules have to the understanding of religious phenomena. Among the various mental modules discussed by Barrett, Boyer, and Tremlin, let us consider Barrett's rather provocative case for what he terms humans' 'hypersensitive agent detect device' (HADD). As Barrett outlines it, research in cognitive science indicates humans are equipped with a mental system that disposes them to attribute events and states of the world as sourced to an agent. Put a bit differently, in circumstances of unknown causes, humans tend to make sense of the world by positing a being that has beliefs and desires and is capable of acting in the natural world.

The origin of the HADD system is seen as straightforward, and it comes in the form of an evolutionary explanation. In terms of fitness, there is much to be gained by taking advantage of any circumstance where the cause of some state or event is, in fact, due to an agent. By contrast, costs to fitness in cases of wrongly attributing causes of states and events to an agent are perceived as quite low. As a consequence, HADD is taken as fitness enhancing. Most importantly for CSR researchers, though, HADD has implications for understanding religion. A heightened disposition to attribute events and states of the world to agents would appear to be an important contributing factor in a belief in supernatural agents. Even a cursory review of religious history reveals that both maladies (e.g., sickness and drought) and beneficial outcomes (e.g., a successful hunt) are sourced to the work of gods or spirits. The HADD module, then, occupies a potentially significant role in explaining a common characteristic of human communities, namely, the belief in gods or spirits who operate in the natural world.

In the wake of sketching Barrett's HADD hypothesis, there may be some value in making explicit that the research claims about religion coming out of not only CSR but also in any investigation within the new science of religion are typically established by extension or significant interpretation of available data. Barrett's example of the HADD is instructive. One might point out that the data that indicate the presence of the cognitive module (e.g., discovered under experimental conditions) is first established

and only then is extended to, or interpreted as having application for, religious belief. There is, of course, nothing inherently objectionable in the extension or substantive interpretation of available data for CSRs or any other purpose. In fact, this form of theorizing might be seen as a hallmark of genuinely progressive scientific investigation. And, indeed, this sort of theorizing is an integral part of the new science of religion. Philosophically speaking, however, there is a wealth of opportunity for posing questions regarding both the character and warrant of interpretations generated within, and by empirical findings in the new science of religion.

Equally important, though, beyond the possibility for all kinds of internal type questions related to research coming out of the new science of religion, it is important to recognize that there are 'external'-type questions that arise as well. By external questions, we mean those issues that arise mainly as a consequence of taking as justified theories that purport to explain religion. That is, if one accepts the adequacy of CSR qua a successful explanatory theory for religion, one might then further ask what that implies for religion. Principally, the implications of interest concern the perceived legitimacy of religious belief and practice. Notably, most of those working within the new science of religion, particularly areas of CSR, have been silent on questions regarding the implications their research has for the legitimacy of religion (Visala, 2011, p. 154). Nevertheless, one might find three distinct meta-interpretative frameworks that describe the possible implications of the new science of religion.

The three meta-interpretative frameworks we identify can be summarized as follows.[2]

1. The delegitimizing framework states that the justified hypotheses from the new science of religion represent a rational threat to religious belief and practice.
2. The legitimizing framework states that the justified hypotheses from the new science of religion serve, at least in some cases, as rational support for religious belief and practice.
3. The non-relevance framework states that the justified hypotheses from the new science of religion can have no impact on the rationality of religious belief and practice.

Each of these meta-interpretative frameworks has its advocates and corresponding supporting arguments; however, in the remainder of the essay, we want to examine most closely just the delegitimizing and non-relevance frameworks. Our reason for this focus is that among many religious study scholars, as well as lay consumers of the

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[2] In *Naturalism, Theism and the Cognitive Study of Religion*, Aku Visala proposes three possible readings of the relationship between CSR and Theism: 1) The Falsity of Religious Belief Thesis; 2) the Religious Relevance Thesis; and 3) the Religious Agnosticism Thesis. He argues that reading 2 is the most reasonable because reading 1 presupposes a strict naturalism, which he has argued is not the only philosophical framework for CSR, and reading 3 seems to "go a bit too far" as there "are reasons to think that some CSR theories might challenge some claims associated with theism as well as have an impact on some arguments made for (and against) theism" (p. 159). The main thesis of Visala's work is to argue against the claim that a strict naturalist framework (i.e., physicalism) is necessary for CSR methodology or current theories in order to argue that CSR does not necessarily imply atheism. Visala is not trying to dismisss the viability or the findings of CSR as a research project, but rather argue that it is compatible with a "broad naturalism" grounded in a non-reductive materialism that denies the causal closure of the physical. It should be noted that Visala's book is an attempt at working out of implications and findings of CSR that the current project argues is necessary prior to adoption of any one of the meta-interpretive framework. We thank an anonymous reviewer for referring us to this work.

findings coming out of CSR, these frameworks represent the presumptive foundation for expressed attitudes toward the legitimacy of religion. Just as important for our purposes, though, proponents of these two meta-interpretative frameworks frequently undergird their position by appeal to considerations of reduction and 'reductionism.' In the next sections, we seek to scrutinize how the notion of reduction is presumed to function in support of these respective meta-interpretative frameworks.

Reductionism in the Study of Religion

The problem of invoking reduction to establish one's position for or against a certain explanation of religion is not new or limited to CSR. The history of the field of religious studies is filled with discussions of the problems and promise of reduction that are often used to establish the norms of scholarly inquiry. A brief examination of these debates will highlight the issues that can emerge in the current debates surrounding CSR if an underdeveloped sense of reduction is employed.

The first camp of religious study scholars we identify are those we refer to generically as the 'sui generis camp.' Members of this sui generis camp reject any reductive account of religion on the grounds that reductionist forms of inquiry are not salient to understanding religion; accordingly, proponents of the sui generis view identify with what we have called the non-relevance meta-interpretative framework. The premise of this sui generis view is that religion is a unique kind of phenomenon, one that requires a unique method in order to respect its essence qua religion. If non-religious methods are used to study religion, so the narrative goes, then the religious aspect of the object of study will be lost. As Wayne Proudfoot describes it, 'The distinctive subject matter of [the study of religion], it is argued, requires a distinctive method. In particular, religious experience cannot properly be studied by a method that reduces it to a cluster of phenomena that can be explained in historical, psychological, or sociological terms. Although it is difficult to establish exactly what is meant by the term, the label "reductionist" is deemed sufficient to warrant the dismissal of any [explanatory] account of religious phenomena' (Proudfoot (1985), p. 190, emphasis added[3]). By extension, implicit in the sui generis view of religion, the aim of religious studies becomes protecting the unique essence of religion from reductive accounts.

Expectedly, any method of inquiry that questions the unique essence of religion or tries to explain it without accounting for this essence is labeled as reductionist and, consequently, is deemed as an illegitimate account. Furthermore, if one holds the sui generis view, religious study scholars become defenders of religion, protecting 'the sacred' from reductive accounts and working against inquiries that seek to understand religion in terms other than its own. Reducing accounts are seen as violating religion and thus must be restricted from the field. It is worth pointing out that many religious study scholars see this view of religion as problematic because of its tendency to create what Proudfoot terms protective strategies (Proudfoot (1985), p. 99). A protective strategy can be understood roughly as an adoption of norms that prevent certain lines of critical inquiry. Indeed, as the quote from Proudfoot reveals, any line of inquiry that seeks to explain religion by non-

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[3] The emphasis we add here is to highlight that our project is intended to help clarify Proudfoot's stated confusion about the term 'reduction'.

religious methods is labeled as reductionistic, and is, thereby dismissed as violating the norms of the field. Thus, those in the sui generis camp support a non-relevance framework in terms of explanations of religion. The explanations offered cannot actually explain the essence of religion and, thus, are explaining something else. They do not say anything about religion and are not relevant to our understanding of this essence.

In stark contrast to the sui generis camp are the naturalists who embrace reductionism. Naturalists, such as Russell McCutcheon (1997; 2001) do so, at least in part, because reductionist methods offer a way to liberate religious studies from protective strategies. On the naturalist account, protective strategies can emerge when accounts of religious adherents and so-called crypto-theological studies are permitted within the field. Alternatively, for the naturalist, protective strategies undermine genuine scholarly engagement with religion. Instead, religion must be reduced to natural phenomena. That is, the field should not place limits on how religion can and should be studied, particularly because it is a reductive method. In fact, the methods that come under the harshest scrutiny on this view are those that avoid reduction, as this is often seen as preserving a crypto-theological position in the field. Moreover, the way to avoid this issue is by adopting so-called reductive methods. By using reductive methods, we free our inquiry of protective strategies and create a critical, 'scientific' discourse that has no allegiance to maintaining an essence of religion. Here, reduction is understood as eliminating the distinctive religious elements from the scholar's investigation and understanding of religious phenomena. Reductionist investigations, then, are committed to non-religious forms of explanation of religious phenomena. If, then, one offers a reductive account, principally a reductive explanation, scholars have legitimized their work as scholarly and critical in a way that cannot be attained by a non-reductive account (if, as we will address later in the paper, such an account is even possible). In sum, then, reductive explanations are scientific whereas non-reductive accounts are 'theological' or 'religious.' In this way, those who embrace reductionism can be seen as supporting the delegitimizing interpretive framework as they hold that the religious or theological account should be superseded by the reductionistic naturalist account.

This brief sketch of the field has not been able to capture the full history and complexity of these debates nor all the issues that are at stake in them. Furthermore, the debates continue in the field and have incorporated various other concerns regarding post-colonialism and the nature of the discourse of religious studies.[4] In the scope of this paper, we cannot address these concerns. However, derivative from the above sketch of religious studies, it is evident that for both the sui generis camp defending the non-relevance meta-interpretative framework and the naturalists, defending the delegitimizing meta-interpretative framework, reduction is a core concept that establishes what counts as a valid investigation within the field of religious studies. For those in the sui generis camp, the reduction of religion via explanation means that there has been a distortion or loss of the target of inquiry. Furthermore, the sui generis camp insists that reductive methods for understanding religion do not account for the irreducible religious aspects of the phenomenon; they are, consequently, illegitimate.

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[4] There are numerous discussions regarding these issues. For representative examples, one can look at the debate between Francisca Cho and Richard K. Squier and Edward Slingerland in the Journal of the American Academy of Religion (Cho & Squier 2008a, b, c; Slingerland 2008a, b, c) or the review symposium of Anne Taves's Religious Experience Reconsidered in Religion (Stausberg et al. 2010).

For the naturalist, the rejection of distinctively religious elements via a commitment to reductionism means that investigations into, and especially explanations of, religion are intellectually respectable. Clearly in the divide between the sui generis camp and the naturalists, there is a dichotomy between religion as it manifests itself in the world and the study of religion; moreover, this dichotomy fosters an antagonism between the two factions of religious study scholars, an antagonism that is rooted in the different attitudes toward reductionism. For the sui generis camp, reductive accounts are seen as a threat to religion, a threat that motivates attempts at insulating religion from certain forms of investigation; the consequence is a defense of the non-relevance meta-interpretative framework. For the naturalists, the scholarly danger comes from restricting forms of inquiry to religious accounts. Reductive methods may indeed be threatening to religion, supportive of the delegitimizing meta-interpretative framework. But, these methods are appropriate methods for investigations of religion.

   In the remainder of the paper, we aim to show that these positions among different factions in religious studies are not well supported by any sensible understanding of reductionism. Furthermore, we will show that this should serve as a cautionary tale for the interpretation of CSR, which would repeat this error if it were to adopt an underdeveloped sense of reduction to support one of the meta-interpretative frameworks.

Reexamining Reduction

The diverse views about the implications for the new science of religion's efforts to explain religion reveals a need to think more precisely about the related notions of reduction and explanation. Even in the above, it is evident that at various points, reduction is an opaque concept, invoked in radically different ways and to significantly different ends. In the following, we want to carefully scrutinize how the notion of reduction is understood with respect to the new science of religion and its implications. In particular, we seek to examine more closely the presuppositions about how those understandings of reduction are supposed to undergird either the delegitimizing or non-relevance meta-interpretative frameworks.

Reduction as 'Debasing'

To begin, consider one way of understanding reduction. Reduction, according to this first interpretation, would refer to something akin to debasing. For example, when I critique a business owner for 'reducing' her employees to mere instruments of product creation, my critique rests on the failure of the business owner to properly respect her employees as persons. Perhaps the anti-reductionist (e.g., the sui generis camp), reacting to the scientific study of religion, simply means at points to use reduction in this way. In fact, a good deal of the anti-reductionist discussions within religious studies fits with this debasing view of reduction. As outlined previously, for example, one of the most common critiques of reductionism in the study of religion is that such scientific approaches fail to account for religion's essence. Plausibly, the concern being expressed in this idea is that reductive accounts of religion, such as those from CSR, somehow disrespect, or distort religion by wrongfully minimizing religion's content and character.

In order to get some sense about how this anti-reductionist line of thinking works consider an argument offered by Dennett (2006). Dennett might be seen as engaging something close to the debasing interpretation of reductionism by examining whether we need to respect (intellectual) boundaries of religious communities by resisting scientific investigation of religion. To begin, Dennett sensibly notes that respect for others compels us to recognize persons' own perspectives and experiences just in case they pose no harm to others; yet, it is difficult in many cases, including that of religion, to be sure a given action or institution is non-threatening to others (presumably in practice, not just in principle). Dennett states, 'religion is too important for us to remain ignorant about. It affects not just our social, political, and economic conflicts, but the very meanings we find in our lives' (Dennett (2006), p. 14–15). Moreover, Dennett ultimately emphasizes this idea in a broad challenge to those who would insist on thinking the scientific study of religion is disrespectful. 'If we shouldn't study all the ins and outs of religion, I want to know why, and I want to see good, factually supported reasons, not just an appeal to the tradition I am rejecting. If the traditional cloak of privacy or "sanctuary" is to be left in place, we should know why we're doing this, since a compelling case can be made that we're paying a terrible price for our ignorance' (Dennett (2006), p. 18–19). In this vein, if we return to the example above, a straightforward argument can be made against an employer's reducing her employees to mere-instruments, one rooted in, say, the autonomy of human beings. But, it is not at all evident what the corresponding source of the debasing in the case of the scientific study of religion would be. But just as important, Dennett's argument forces the anti-reductionist to contend with the possibility that there is a favorable trade in values even if religious adherents, or defenders of religion generally, do in fact experience a degree of offense at the scientific study of religion.

To be sure, scholars in the sui generis camp may attempt to point out that Dennett's concern misses the actual substance of the anti-reductionist's objection to the scientific study of religion. The issue, these scholars may claim, is not that reductionism is offensive; rather the issue is that there is an inability of any reductionist account of religion to preserve the essence of religious phenomena. According to this line of argument, insofar as the naturalist employing reductionist methods intends to provide a full explanatory account of religious phenomena, and she consistently fails to do so, she debases religion. Put a bit differently, the naturalist disrespects religion by wrongfully minimizing (explanatorily) the content and character of religious phenomena. On its surface, the argument is plausible; but a more thoughtful evaluation of the argument reveals that if this is the articulation of the argument from the debasing interpretation of reduction, then the argument remains woefully underdeveloped.

The above re-characterization of the sui generis camp's anti-reductionist argument might be summarized by one core concern, namely that there is an explanatory gap between religious phenomena and the naturalistic factors that purport to explain those religious phenomena. Summarized as such, however, there are two crucial issues that go unaddressed, and thus render the argument, at best, incomplete. First, proponents of the sui generis view neglect to establish the universality of the (purported) explanatory gap. Consider that the targets of investigation by, say, the CSR program are a range of religious phenomena, including various types of religious belief, practice, and experience. Anti-reductionists frequently highlight the apparent explanatory gap in experiential elements of religious life, but that supposed explanatory gap is neither unique to religious

experience, nor, more importantly, does it address explanatory accounts of religious belief or practice. To return to our earlier illustration of CSR research, Barrett's HADD module purports to explain the prevalence of humans' beliefs in supernatural beings as well as the occurrence of natural phenomena that are supposed to result from supernatural beings' activities. If the HADD module explanation leaves an explanatory gap regarding humans' belief in supernatural beings, that explanatory gap is not apparent. Granted, the HADD module explanation may be mistaken, but the mistake is not, or at least not clearly, in that it wrongfully minimizes the content or character of religious belief.[5]

The universality of an explanatory gap, then, is one issue that goes unaddressed by the anti-reductionist who interprets reductionism as a form of debasing. There is, however, a second issue that also is left unexamined. Suppose for the sake of argument that there is a universality to the explanatory gap between religious phenomena and the naturalistic elements purporting to explain those phenomena. The anti-reductionist thesis still requires more. Anti-reductionists like those in the sui generis camp must maintain that not only is there a universal explanatory gap, but also that the explanatory deficiencies cannot be overcome by discovering a role for additional naturalistic factors. One issue within the study of religion illustrates this point beautifully. Proponents of the sui generis view are disposed to insist that naturalistic explanations of religious phenomena are non-salient regarding the meaning of religious life. Perhaps, one may concede, CSR does reveal much about religious belief when, for example, it makes discoveries of things like the HADD module; however, the argument may continue by maintaining that nothing from CSR can account for the value or sense of importance religious beliefs have for religious believers.

The argument from meaning is both prevalent and, at first glance, compelling. And yet, the reductionist can push back. The core of the response is a simple question of why naturalistic factors cannot explain meaning. To be clear here, the point for us is not to maintain that the reductionist has a convincing argument demonstrating naturalistically derived meaning; rather, the point is that the naturalist has plausible means of denying the view that meaning resists naturalistic explanation, and that the anti-reductionist bears a significant burden in demonstrating that those views are untenable. Moreover, the burden must be shouldered not only for the issue of meaning, but for all of the religious phenomena the anti-reductionist contends must be insulated from the naturalists' reductionist investigations.

The above suggests that persons in the sui generis camp advocating for a non-relevance meta-interpretative framework cannot simply invoke the concept of reduction, in the sense of debasing, as a justification for that framework. Equally important, though, is to make clear that defenders of the new science of religion who identify as reductionists in the debasing sense are in no better position to advance their delegitimizing framework. The temptation might be to think that the success of a scientific explanation(s) of religion is reductionist akin to this debasing sense but might

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[5] Proponents of the sui generis view might object to this claim. They might maintain that the HADD module DOES wrongfully minimize belief in supernatural beings, for it fails to account for the individual subject's own sense of their commitment to those beings' existence and activity. However, this response betrays a terrible misunderstanding of explanation in this context. The explanadum is not individuals' own sense of their propositional commitment, it is the prevalence of individuals who have this type of commitment. All the response does, in short, isintroduce a new explanatory project, and surely an explanation cannot be faulted for failing to have explained something it does not set out to explain.

better be construed as entailing not that such reductionism is disrespectful but that religion is 'foolish' or 'trivial.' Parallel to the need for thinking about the source of disrespect in the scientific study of religion, though, there is likewise a demand for the advocate of the delegitimizing framework to articulate the source of the foolishness that is implied. If scientific explanation reduces religion, insofar as it trivializes religious belief and practice, it does not do so inherently. The trivialization must be accounted for in specific considerations over and above a simple interpretation of reduction as debasing.

Reduction as an Explanatory Strategy

In the wake of the above discussion, it is essential to also approach matters of reductionism from a slightly different angle. Much of the attention commentators and consumers of the new science of religion pay to matters of reduction centers not on issues related to 'disrespecting' or 'minimizing' religious phenomena but rather to the relationship between reduction and explanation. Often times one sees within religious studies a rather crude equating of reduction with explanation. But, this presumed equivalence is problematic. For one, there seem clear instances where opponents to reductionism in matters of religion will endorse explanations. At least some proponents of the sui generis view presumably legitimate explanations of the following sort: the Christian explains her experience by reference to the work of the Holy Spirit. Seemingly in these cases, the religious study scholar is supposed to respect the explanation of the religious believer. But accordingly, there can be no presumption that the explanation delegitimizes the religious experience by way of reducing it to the work of the Holy Spirit. Such examples suggest that opponents of reductionism in the study of religion would do well to think more carefully about how their sense of reduction is connected to explanation generally. To be fair, there is little doubt about whether reduction and explanation are intimately related to one another. The issue is just what that relationship is, and, by extension, whether that relationship helps illuminate the implications for either the delegitimizing or non-relevance frameworks.

Consider once more our Christian who explains a certain conscious experience by way of having been affected by the Holy Spirit. Advocates of CSR may insist that it is (say) a unique stimulation of some evolved cognitive module that causally accounts for that very experience. Defenders of religion, whether religious believers themselves (e.g., our Christian) or scholars of religions working under the sui generis view, will negatively respond with charges of reduction. The presumption is that there is something objectionable in these sorts of explanations, and what is objectionable is expressed by identifying it as reductionist. Of course, advocates of the delegitimizing framework will insist that there are reasons to privilege the CSR explanation, perhaps to such a degree that it serves as part of the rational basis for claiming that findings from CSR render irrational such religious beliefs. To return to an earlier point, one might point out that the explanation provided by the new science of religion is a publicly available means for answering why the person experienced what they did; it thereby avoids the worry over protective strategies. Equally noteworthy, the publicly available means of explanation is enabled by making the explanation conform to a reductionist strategy in the sense that it focuses on the systematic workings of an underlying level of organization (i.e., cognitive modules of the brain) to causally account for the experience.

The above makes evident that one of the most substantive issues surrounding the new science of religion relates to the strategic use of explanatory reductions, as well as the implications those explanatory reductions might have for religious belief and practice. But, in order to have any hope of understanding potential implications of explanatory reduction as it appears in the new science of religion, one must first be clear about the nature and value of explanatory reductions generally.

To begin, there should be little disagreement over whether our understanding and ability to fruitfully act in the world rests on the success of explanatory reduction as a guiding investigative strategy. Moreover, much of what underlies the commitment to explanatory reduction is rooted in the idea that the world is mechanistic in nature and that, thereby, our understanding of the world requires decomposing a system into parts and articulating the normal interactions of those parts. The biologist, for example, explains to her undergraduate students that cell division occurs by way of the cell's composite entities (e.g., DNA, telomeres, and membranes) acting in certain ways and carrying out their distinctive functions. Mechanistic science can be traced at least to the scientific revolution and has occupied a central role in recent accounts of explanation among philosophers of science (Machamer et al. 2000). Concerns, therefore, about reductionism cannot be motivated by a general skepticism regarding the value that explanatory reduction provides to our understanding of the world. Instead, the worry stems from a presumption that explanatory reductions imply an eliminativism for the phenomena and/or theory that is explanatorily reduced (i.e., that the explanatory reduction eliminates from appropriate discourse reference to the entities or states of affairs that are explained). Among some philosophers of science, the elimination of phenomena and or theory is entailed by successful explanatory reduction (see for example, Bickle (2003) and his view of psychology). But, many philosophers have denied that mechanistic explanatory reduction entails any such elimination (Wimsatt 2006; Bechtel 2009; Craver 2007). As we diagnose matters, we think the actual concern about CSR's being 'reductionist' centers on this presumption of eliminativism. Indeed, proponents of both the non-relevance and delegitimizing meta-interpretative frameworks appear to work under the presumption that explanatory reduction implies eliminativism. Accordingly, the question for proponents for either one of these meta-interpretative frameworks is why a successful explanatory reduction of religious phenomena would entail the elimination of those religious phenomena or the existing theory used to understand those religious phenomena.

Consistent with those philosophers who have worked to dissociate explanatory reduction from eliminativism, we contend that nothing inherent to explanatory reduction serves to justify either the delegitimizing or non-relevance frameworks. Nevertheless, we maintain that it is possible that explanatory reduction has eliminativist implications. Our view is that the relevant implications (e.g., regarding the legitimacy of holding to theoretical commitments) for explanatory reductions are both particular to instances of explanatory reduction and significantly socially determined. Described in a bit different terms, the affects of any given explanatory reduction will be local rather than global, since explanatory reductions have radically different impacts in different circumstances. We want to outline some of these different circumstances and examine how our view of local implications for explanatory reductions relates to CSR.

One of the easiest ways to begin to appreciate the locality of implications for explanatory reduction is to consider explanatory reductions applied to observables versus those targeting theoretical posits. Notice first that in the case of observables, an explanatory reduction should have no implications regarding the rationality of a commitment (either epistemic or practical) to the reality of those observables. When astronomers offer an explanatory reduction of planet formation, one coming in the form of cosmic dust and gravitational forces, it is senseless to think that that explanatory reduction threatens an astronomer's rational commitment to planets' reality. This point about observables is relevant to CSR as well. If CSR explanatorily reduces religious belief and practice to the mechanistic workings of various cognitive modules, this would not somehow render religious belief and practice non-existent. Eliminativism is simply a non-starter for CSR's explanatory reductions of certain religious phenomena. Contrastively, explanatory reductions in the case of theoretical posits may prove different in their implications.

Similar to explanatory reductions in the case of observables, at least some explanatory reductions involving theoretical posits do not undermine a commitment to those theoretical posits. Biological anthropologists' commitment to *Homo habilis* is not threatened by detailing its evolutionary history at the genetic level. Nevertheless, science frequently does introduce novel theory that displaces an older theory. Moreover, this theory displacement often depends on the possibility for successful explanatory reductions. Theory accounting for the distinction between living and non-living objects on the basis of vital forces, for example, was abandoned with the explanatory reductions offered by cell and molecular biology. Theory postulating God's role in the development of organisms in utero was likewise rejected with the explanatory reductions that came from cell and molecular biology. Explanatory reductions, then, can have implications for theoretical commitments, but since they do not necessarily have them, any proposed implications in the case of religious phenomena require greater attention.

The above discussion of the locality of implications for explanatory reductions demonstrates the need to think more about what distinguishes instances of explanatory reduction that lead to modifying or rejecting theory from explanatory reductions that have no such consequences. Admittedly, though perhaps not surprisingly, we have no intent of trying to articulate a full account of how to answer this question; but we do think that we can mention one significant point that bears on this question, particularly as it pertains to the case of explanatory reductions for religious phenomena.

Much of the attention the CSR has drawn with respect to its implications for religious belief and practice might be categorized broadly as logical concerns. Summarily, the idea of a logical assessment seeks to evaluate questions like this. Given a finding F from CSR and a set of religious beliefs R, are there any conditionals of the form If F and R, then P and $\sim P$. Since F is supposed to be empirically justified and we must deny the contradiction, revision to the set of religious beliefs would be logically forced. If any such logical relations can be found, the delegitimizing framework is bolstered. Recognize too that nothing changes if this logical assessment is given an inductive formulation (e.g., under a probabilistic formulation $P(R/F) < P(R)$). Conversely, if no such logical relations hold, then a non-relevance framework might be thought to gain some credence. In the light of our discussion of explanatory reduction, however, we want to suggest that this logic focused form of assessment neglects the potential implications that can come with explanatory reductions. We want to suggest that the implications of explanatory reductions are often times determined not by logical relations between considered propositions but by extra-logical factors.

By an 'extra-logical' factor, we mean simply a factor falling outside formal deductive and inductive logical principles that sensibly functions to determine theoretical commitments.[6] Among the most commonly recognized extra-logical factors we have in mind are as follows: parsimony, theory elegance and fecundity, projected practicality, as well as risk tolerance for adopting a possibly flawed theory. Extra-logical factors, we contend, can occupy an important role in determining the implications of some explanatory reductions, including, we think, those CSR provides. Recognize as well that these extra-logical factors do not supersede logical considerations in matters relating to the epistemic status of theory; instead, they augment logical considerations. Where the logic does not determine theoretical commitments, extra-logical considerations can occupy a role. Moreover, ultimately, our view is that it is communities of epistemic agents that must respond to explanatory reductions, and they will do so responsibly not only by ensuring they hold a logically coherent set of beliefs but also by coalescing around the applicability of certain extra-logical factors.

At this point, we want to turn our focus to considerations regarding explanatory reductions of religious belief and practice specifically. In particular, we want to demonstrate concretely how locality applies in the case of explanatory reductions for religious belief and practice. In keeping with our view of locality, we maintain that a case can be made for the delegitimizing framework regarding certain religious belief and practices. Alternatively, proponents of the non-relevance framework can insist that explanatory reductions of religious belief and practice simply are non-salient relative to their legitimacy. Say a subject Bernard has a unique and moving conscious experience that he, as a Christian, attributes to the work of the Holy Spirit (a theoretical entity in this case). A CSR researcher advances the view that the experience is the consequence of a certain stimulation of a particular cognitive module. Both Bernard and the CSR researcher may hold a logically coherent set of beliefs; however, what separates them is the balance and priority among extra-logical factors. The CSR researcher may emphasize parsimony, while Bernard eschews parsimony, highlighting instead his perception of his theoretical commitments' practical value. If, moreover, the explanatory reduction the CSR researcher advances is going to have implications for the religious beliefs and practices of Bernard (i.e., if the delegitimizing framework is correct), then it will likely be because Bernard's community of religious believers somehow come to shift their view of relevant extra-logical factors. Ultimately, neither the proponent of CSR who advocates the delegitimizing framework nor Bernard's community who defends the non-relevance framework are logically mistaken. They are simply different communal responses to the explanatory reduction CSR has on offer, communal responses that are rooted in different commitments to extra-logical factors.

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[6] This idea of 'extra-logical factors' is inspired by Willard V. O. Quine's classic views on empirical underdetermination (1951) but even more by Longino's (2001) social philosophy of science, wherein 'non-cognitive values' are an integral part of a satisfactory account of good scientific practice.[6] This line of argument will no doubt prove unconvincing to many who insist that the final arbiter of successful epistemic practice is the truth, in its traditional objective, or correspondence, sense. These critics may contend that one should generally expect sound epistemic practice to converge on a single set of correct beliefs, and that the position we've adopted here fails in this regard. This criticism targets a fundamental philosophical issue that goes well beyond the scope of this essay; however, we would acknowledge that our views do commit us to rejecting this standard for successful epistemic practice. We thank an anonymous reviewer for encouraging us to think about this point.

The implications for an explanatory reduction, then, are local and may or may not, in different cases and among distinct epistemic communities, lead to modification or rejection of theoretical commitments. In that light, though, one might look at this locality idea and insist that it ushers in an unsettling relativism. There is no doubt that the position has a relativistic dimension, but we want to suggest that it is a benign relativism appropriately reflective of practical realities. Recognize first the decidedly non-relativistic character of the proposal. The extra-logical factors themselves are effectively universal across epistemic communities. Parsimony is a salient extra-logical factor for both Bernard's community and the proponent of the delegitimizing framework. What may differ between these epistemic communities is the relative importance placed on different extra-logical factors—the balance and trade-offs. This distinction between forced acceptance of some extra-logical factors as governing norms and the indeterminacy regarding the priority and balance of those extra-logical factors is an essential point for understanding the implications of explanatory reductions.

Most important from our perspective, the view is responsibly reflective of epistemic practice. It is a common complaint of atheists that the theist persistently logically accommodates any and all empirical findings or critical theoretical views. That complaint, however, need not reflect a radically different commitment to rational principles, but instead may signal a difference in attitudes to certain extra-logical factors. This, in turn, makes clear that any rational exchange in such a setting should be about the priorities regarding commitments to extra-logical factors. One may not be able to rationally force shifts in those commitments, but articulating what those commitments are may occasion reflection that leads to a shift nevertheless. All of this, we suggest, reinforces the plausibility of our fundamental claim regarding explanatory reductions: explanatory reductions have their implications not because they logically force those implications; rather, they have those implications because epistemic communities respond to those explanatory reductions in particular ways and with attention to certain extra-logical factors.[7]

Conclusion

The notion of reduction and its relationship to explanation occupies a central role in how people, including religious studies scholars, respond to the investigations and findings from new forms of the scientific study of religion. Unfortunately, few of these responses rest on a clear understanding of reductionism and even less on a sensible account of the implications a clear understanding of reduction might actually have. Our efforts in this essay have been to explicate the possible implications to closely examine the notion of reduction and assess how different senses of reductionism might facilitate one or another of the possible implicational frameworks. In the end, however, we contend that nothing in the notion of reduction itself does in fact favor any one of those implicational frameworks.

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[7] This line of argument will no doubt prove unconvincing to many who insist that the final arbiter of successful epistemic practice is the truth, in its traditional objective, or correspondence, sense. These critics may contend that one should generally expect sound epistemic practice to converge on a single set of correct beliefs, and that the position we've adopted here fails in this regard. This criticism targets a fundamental philosophical issue that goes well beyond the scope of this essay; however, we would acknowledge that our views do commit us to rejecting this standard for successful epistemic practice. We thank an anonymous reviewer for encouraging us to think about this point.

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