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Bias in the Science and Religion Dialogue? A Critique of “Nature of Evidence in Religion and Natural Science”

E. V. Rope Kojonen 

ABSTRACT

In their article “Nature of Evidence in Religion and Natural Science” (Theology & Science 2020), Petteri Nieminen and colleagues compare the use of evidence in religion and science. Their claim is that religious use of evidence is characterized by “experiential” thinking and confirmation bias, which makes integration with science difficult. I argue, however, that their methodology is unreliable and their theory of religious cognition is too simplistic. Further research should take the complexity of “science,” “religion” and “rationality” more sufficiently into account.

KEYWORDS

Science and religion; cognitive science of religion; confirmation bias; rationality of religious commitment; fine tuning; historicity of Jesus; social epistemology

Introduction

Are religious and scientific ways of knowing so different that this makes integration between them unfeasible? Yes, answer Petteri Nieminen, Juuso Loikkanen, Esko Ryökäs and Anne-Mari Mustonen in their recent *Theology & Science* article.¹ They argue that “whereas religious claims are based on experiential evidence, scientific claims are based on experimental evidence.”² They characterize experimental thinking as intuitive, based on personal experience and testimonials, resistant to change, and characterized by confirmation bias, “i.e. concentrating on data that support one’s preconceptions and dismissing contradictory evidence.”³ In contrast, they see scientific thinking as reflective and objective, falsifiable and testable, and based on more reliable types of evidence.⁴

To ground their account, they cite a variety of examples, beginning with theories of the cognitive basis of religious belief and the idea of the “Hyperactive Agency Detection Device.” They go on to discuss the importance of testimony for religious belief, and look into Christian, Mormon and Islamic interpretations of science, also including fine-tuning design arguments as an example.⁵ These, they argue, are based on the selective use of data and are plausible evidence of religious confirmation bias. Presenting their perspective as the scientific way of seeing these issues, they conclude that “[o]bviously, from the viewpoint of the scientific community, this does not lead into integration but is dismissed as cherry picking.”⁶ They conclude that religious experiential rationality and scientific objectivity are too far apart for integration.

Formulating a general theory of religious rationality, scientific rationality and their relationship would clearly be valuable. However, delving into their theory, several large problems became apparent: (1) The basis of Nieminen and colleagues’ theory of religious

cognition is problematic both theoretically and empirically, (2) their methodology in identifying confirmation bias is unreliable, (3) using their methodology, their own article would also exhibit confirmation bias, (4) many of their concrete examples are problematic, and (5) their theory does not take the complexity of “science,” “religion,” and “rationality” into account adequately. Nevertheless, Nieminen and colleagues have presented an ambitious and courageous synthesis, and my hope is that my critical comments will encourage the development of a better model.

Hyperactive Agency Detection and Religious Rationality

Nieminen and colleagues take the hypothesis of the “hyperactive agency detection device” as the starting point of their article, arguing that religious belief might be based on a human tendency to see signs of agents even where none are present. However, these explanations have already been discussed extensively in the literature, and have also been tested with further empirical data. This has uncovered severe problems that Nieminen et al would need to take into account for their model to be credible.⁷

To introduce the discussion, a few words on cognitive science of religion are necessary. In studying how human reasoning works in practice, it has been popular to divide human rationality into two systems: “System 1,” working intuitively and quickly, and “system 2,” working slowly through rational reflection. Applying this to religion, it has often been argued that religious beliefs are impacted to a relatively larger degree by the intuitive thinking important to system 1, in comparison to scientific practice, which is more dependent on the reflective thinking of system 2.⁸ While system 1 has typically been seen as indispensable for human life (since we cannot rationally reflect on everything we do, like the activation of each muscle as we move our hand), it has nevertheless also been argued to be more prone to errors (because it relies on speedy heuristics that are mostly true, but not always). The hypothesis that the intuitive human system for detecting agency is “hyperactive” is one such proposed explanation for the origins of religious belief in supernatural agents—although the scholars who argued for this hypothesis themselves differed on whether it actually generates religious belief or not. Justin Barrett famously argues that our cognitive systems make us “born believers”⁹, while others argue merely that they make forming religious beliefs cognitive easy.¹⁰ Scientists and philosophers also differ on whether the evidence from the CSR has any implications for the rationality of religious belief.¹¹

On to problems in the use of the HADD hypothesis to explain religious belief. First, there is significant debate about the scientific merits of the hypothesis. There are serious challenges to the assumption that HADD constitutes a cognitive module of some kind. It seems more plausible that multiple systems and processes contribute to the representation of agency. Having one single module prone to false agent detection would have had adverse effects on survival, as it would make hunting, for instance, more difficult. Empirical evidence shows that our agency detection is reliable in most cases, and indeed needs to be reliable in order to enable us to work through the day.¹² The experimental evidence on HADD and its connection to religious belief also tends to disconfirm the explanation.¹³ In a recent study, for example, participants actually had a bias against assuming that agents were present even when presented with signs.¹⁴ Moreover, a higher tendency to detect agents did not correlate with religious belief.¹⁵

Second, we humans are typically able to evaluate our agent detection through our reflective faculties, and commonly do so, especially when the beliefs in question are important to us.¹⁶ Thus, long-lasting beliefs about agents will not typically be produced by intuitive agency detection alone. As Barrett, the originator of the HADD hypothesis, himself argues, the HADD would typically produce false results only in dangerous environments where there is insufficient time to think reflectively.¹⁷ Intuitive agency detection should therefore not be equated with irrationality, and should not be opposed to reflective recognition of evidence of agents in the way Nieminen and colleagues do.¹⁸ The broader sharp distinction between system 1 and system 2 can itself be questioned. Hugo Mercier and Dan Sperber, for example, argue that reflective reasoning actually relies on the higher-order intuitive inferences about reasons, thus undercutting the sharp distinction between intuitive and reflective thinking.¹⁹

Third, religious beliefs are empirically not only the products of system 1-type reasoning, nor does the HADD provide a causally sufficient explanation of religious belief.²⁰ As Vainio concludes in an article reviewing the relevant evidence,

Our religions are products of both T1 and T2 (as are all other similar spheres of life). Focusing on T1 will tell us something but it will never tell us the whole story. This needs to be borne in mind, or else we cannot but portray religions in a way that does not reflect reality.²¹

Moreover, the HADD hypothesis has difficulty in explaining how religious beliefs are generated on the basis of false perceptions of agents,²² and cannot explain religious beliefs that are not linked to any kind of perception of traces of agency.²³

To be fair, Nieminen and colleagues do also allow for the importance of testimony in supporting religious belief, and for the influence of quasi-rational reflection on the evidence (though they argue that this also involved cognitive biases). The HADD is just the starting point of their analysis. The paper spends more time on examples of religious use of evidence that are (in their opinion) not actually rational or conducive to truth. Thus, even though taking the previous criticisms on board would already fundamentally alter the model, more still needs to be said. I will turn to their methodology.

Problems in Methodology

Though Nieminen and colleagues have not included a detailed section on methodology, their method is apparent from the way they proceed. To show that religious thinking is “experiential” and uses the evidence selectively, they present a wide variety of examples where they think this is true, drawing from both internet blogs and published literature. In each case, they point out contrary evidence and alternative explanations, and then conclude that since the referenced sources do not discuss these alternative explanations, therefore these arguments exhibit confirmation bias. For example, the authors see selective use of evidence in the alleged scientific proofs of the Quran,²⁴ Mormon apologetics,²⁵ creationist baraminology,²⁶ apologetics and biblical scholarship studying the historical Jesus²⁷ and in the use of fine-tuning evidence to support belief in a personal Creator.²⁸ They argue that science must take a skeptical view of such evidences: “From the viewpoint of science, testimonials lack statistical power and cannot be generalized to be valid for large populations nor to construct viable theories without lots of additional research”²⁹ and “by using scientific claims integrated into religion, the writers often

use the data through confirmation bias and disregard parts of the evidence that do not fit their model. Obviously, from the viewpoint of the scientific community, this does not lead to integration but is dismissed as cherry picking.”³⁰

I have grave doubts about the reliability and validity of this methodology for identifying confirmation bias. It seems very difficult to get hold of the cognitive processes of an author, and to rule out alternative explanations, just by reading what they have written. The central problem here is explanatory underdetermination. Confirmation bias could be one reason for not considering objections, but there are also a number of other potential explanations. For example, perhaps the author considered other arguments and objections to be more weighty and important to deal with. Maybe the purpose and genre of the presentation did not require considering the issue exhaustively. Or perhaps they did not consider them due to other human cognitive limitations or biases, instead of confirmation bias. Since other possible explanations exist, showing that some objection is not considered in the written material is not yet a reliable way to identify confirmation bias. An aspect of confirmation bias is also the fact that we tend to explain the opinions of those who we disagree with by reference to non-rational reasons, and downplay their rational reasons for disagreeing with us. Great care should therefore be taken to rule out alternative explanations.

There are other potential problems in the method, such as the selection of material to be analyzed in a way that ensures a representative sample—so that the result of the analysis is not itself based on a selective use of sources and evidence. Based on their own reviews of interactions between “science” and “theology,” many have also drawn the opposite conclusions from comparisons of religious and scientific rationality, presenting examples of religious texts that apparently exhibit a strong “love of wisdom in natural things” and even proto-scientific attitudes.³¹ Moreover, it should be considered that the referenced sources could also have valid and rational reasons for appealing to factors like testimony—a topic I will take up later.

Instead of explaining the problems of the methodology further, my hope is that its problematic nature will become clear by giving examples of the kind of strange conclusions it leads to, a kind of *reductio ad absurdum* -argument. I will now therefore apply the method to Nieminen and colleagues’ article itself. In many cases, their article itself only considers a very small slice of the literature and leaves important alternative explanations and contrary evidence out of consideration. This means that their criteria for identifying confirmation bias and experiential thinking in religion would also lead to the conclusion that their own article exhibits the same features. To be clear, since I do not think the method is reliable, I am not claiming that these omissions are necessarily due to confirmation bias. The point is simply to show the questionable nature of the method, and problems in many of the core examples they use to argue for their understanding of religious rationality. I will focus particularly on the discussion surrounding fine-tuning and Jesus mythicism.

Confirmation Bias and Fine Tuning

Many authors have argued that the fine-tuning of the laws and initial conditions of the cosmos is better explained by divine design than by appeals to naturalistic explanations like chance or the multiverse. This is known as the fine-tuning design argument (FTA).

To criticize the FTA, Nieminen and colleagues rely heavily on physicist Victor J. Stenger's arguments.³² They see themselves as representing the viewpoint of science, in contrast to religious apologetics in which "the actual physics is seldom discussed. From the viewpoint of science, this form of justification is not persuasive."³³ They claim that "this leap from science to confirmation bias is typical of religious, narrative evidence; but from the scientific viewpoint it remains anecdotal."³⁴ The narrative here presents Nieminen and colleagues as dispassionate scientists and scholars analyzing biased religious apologetics.

It is not difficult to find alternative explanations for why the works they cite do not consider Stenger's critique of the FTA. For starters, most of the works cited by Nieminen and colleagues (such as those of Polkinghorne and McGrath) predate the publication of Stenger's book.³⁵ The one that is published after Stenger—William Lane Craig's overview article "Five Reasons to Believe in God"—is broad in its scope, which makes it understandable that Stenger's objections are not reviewed.³⁶ Nevertheless, even these sources do review other objections to the FTA.

To apply the previously stated criteria for identifying confirmation bias—the selective use of evidence and not discussing contrary evidence—the discussion of FTA by Nieminen and colleagues seems very vulnerable. Their reliance on Stenger is itself selective, since Stenger's rejection of fine-tuning represents a minority viewpoint in contrast to most physicists who have discussed the issue, regardless of worldview.³⁷ Physicist Michael G. Strauss has even concluded that those persuaded by Stenger's book are actually the ones suffering from confirmation bias:

After reading this book myself and reading other scientists' reviews of *The Fallacy of Fine-Tuning* it seems that Stenger's arguments are considered strong only by those who already agreed with him, while the majority of scientists who have studied the issue agree that Stenger dismisses fine-tuning claims with little justification.³⁸

On the criteria of not discussing contrary evidence, Nieminen and colleagues do not discuss the extensive responses to their critiques of fine tuning that exist in the literature. For example, the question that "could it be possible that other life forms would have developed in the universe (or on Earth) if the physical constants had been different"³⁹ is a common objection that is frequently addressed in the literature. One problem is that much of the fine-tuning concerns factors that, if not present, would not allow for the existence of any complex molecules. This means that speculation about silicon-based life, for example, does not help in solving the problem.⁴⁰

Astrophysicist Luke Barnes has written extensive responses to Stenger, describing the evidence of fine-tuning with the kind of detail that is understandably missing from more popular-level works like those of McGrath and Polkinghorne.⁴¹ Nieminen and colleagues do reference Stenger's brief response to Barnes⁴²—but notably, this response was never published in the peer-reviewed scientific literature, in contrast to Barnes' article (and Barnes' writings go uncited).⁴³ Moreover, in his response Stenger does not comment on the scientific details of carbon in the very brief part of his response dealing with the issue, but simply appeals to authority. This is the kind of argument that Nieminen and colleagues say is "basically irrelevant" to science—but which they have not noted as problematic when used by Stenger.⁴⁴ Reliance on Stenger, and not dealing with the in depth defenses of fine-tuning that exist in the literature⁴⁵ could therefore be

interpreted as evidence of experiential thinking and confirmation bias by the interpretative methods used by Nieminen and colleagues. So, this example shows that there is something wrong in their methodology, in their use of evidence or both.

Since Nieminen and colleagues have the goal of commenting on religious rationality and its implications for scientific objectivity more generally, it would also have been a mark of objectivity to point out that many of the most potent objections to the fine-tuning argument, such as the normalization problem, have been developed in most depth by religious philosophers such as Hans Halvorson as well as Timothy and Lydia McGrew.⁴⁶

Confirmation Bias and Jesus Mythicism

According to Nieminen and colleagues, respectable and serious “peer reviewed literature doubting the historicity of Jesus is emerging,”⁴⁷ referencing particularly the work of Jesus mythicist Richard Carrier. They are doubtful that “fervent believers”⁴⁸ would be ready to allow for uncertainty about Jesus’ historical existence, and this (according to them) calls into question the possibility of the integration of science and religion. I will get back to the interesting issue of religious commitment as a possible source of bias later—for now, I will again focus on whether their presentation of this example is itself based on a selective reading of the evidence that does not consider central objections.

From the point of view of mainstream historians and biblical scholars, the implication that the work of Carrier and others represents a rising tide of skepticism about the historical Jesus seems to be based on a very selective reading of the literature. It seems more likely that Carrier and other defenders of this position are the last holdouts of a hyper-skeptical eighteenth and nineteenth century outlook that has been abandoned for good reasons in mainstream scholarship.⁴⁹ Citing just Carrier’s critique without discussing the common objections to it, and the reasons why biblical scholars of all worldviews have moved on from such views, could then also be construed as an example of the selective use of evidence, if we were to follow the method used by Nieminen and colleagues.

The details of their argument also seem selective. Following Carrier, they criticize the use of the “criterion of embarrassment” to argue for the historicity of certain events and sayings related to Jesus. According to Nieminen and colleagues, this is fully unreliable, since “mythical heroes often experienced embarrassing situations or shameful deaths but these accounts are not usually taken as evidence for the historicity of these events.”⁵⁰ The use of such a method in biblical scholarship therefore “mixes testimonial proof with more objective historical methods,” the implication being that biblical scholarship is not based on reliable methods but is likely driven by religious bias.⁵¹

Unfortunately, their reliance on Carrier and similar writers has led to a non-standard definition of the criterion of embarrassment. The criterion is not based merely on embarrassing things happening to the protagonist of a story (as with the ancient heroes), but on reporting facts that would be embarrassing or damaging for the author himself or his/her community.⁵² A commonly cited example of this in biblical scholarship is the crucifixion of Jesus, which was contrary to expectations by both Jews, Greeks and Romans, and thus created difficulties for the Church. Moreover, the criterion is typically used in conjunction with other criteria and evidence.⁵³ Contrary to Nieminen and colleagues, it is not always “difficult or impossible to assess when an author in antiquity would have found

an event embarrassing”⁵⁴—we can judge this based on the literature of the time, and knowledge of human psychology. Biblical scholars are aware of the need to do this to avoid the potential problems.⁵⁵ Nieminen and colleagues’ critique of religious apologetics for Jesus’ historicity and resurrection is similarly selective. Regardless of whether we think such apologetics is convincing, many of its proponents do indeed discuss rival miracle claims and other the major objections that exist in the literature.⁵⁶

Testimony in Religion and Science

Nieminen and colleagues are able to point out many examples of religious statements emphasizing the importance of testimony for belief.⁵⁷ They then conclude that “based on these phenomena, we suggest that everyday religion can be justified by experiential evidence and that it is even considered the principal or best form of proof.”⁵⁸ In critique, they argue that such testimonies are mere “hearsay,” not evidence: “For a scientist, none of the above examples would be adequate as proof, because without other documentation they would still be regarded as hearsay.”⁵⁹ They also argue that by ignoring the problem of religious disagreement, religious believers engage in a selective use of evidence, indicative of confirmation bias: “When it comes to religion, instead of actually comparing the eyewitness accounts for their quality, there is a clear tendency of dismissing the eyewitness accounts of other religions for one’s own.”⁶⁰

Let us grant for the sake of argument that many religious believers are too ready to accept eyewitness testimony as evidence. However, there are also religious believers who do attempt to compare the quality of testimonies, and argue for factors that make some testimony more reliable than others.⁶¹ Building a general model of religious rationality based only on examples where believers appear to be ignoring objections (or where the researcher is unaware of the responses given by religious believers to the problem of disagreement) does not appear sustainable, if there are also examples of religious believers doing the opposite. This would be, again, highly selective and could be construed as an example of confirmation bias. The problem of disagreement, while being the primary counterargument against the rationality of believing based on religious testimony, is also one that has been discussed extensively in the philosophy of religion. One important factor to consider here is that the problem does not solely affect religion, but many questions that everyone has to take a stance on.⁶² If persistent disagreement should automatically lead to withholding belief, we would have very few moral, political and scientific beliefs left. Criticizing the possibility of trust in religious testimony would require dealing with the prominent defenses of such a possibility.⁶³

There are also problems in Nieminen and colleagues’ claim that reliance on testimony is not central for science. While I can readily believe them that “expert opinion is considered to be the least reliable source of evidence in the ranking of reliability” in the field of medicine,⁶⁴ testimony means much more than this. Of course, testimony remains crucial in many scholarly fields, such as history. But it is more ubiquitous than many realize in the natural sciences as well: every report of a factual observation in a scientific journal is also a form of testimony. While one might reply that scientific peer review makes such testimony more reliable than average testimony outside science, this does not mean rejecting testimony altogether as a reliable source of knowledge. Rather, it means qualifying conditions under which testimony is reliable. Moreover,

when asked how we know that peer review exists and that it makes the results more reliable, we will have to assume some reliability to testimony again. The reply that “any other researcher is free to assess [...] the results in a peer-reviewed journal article” also does not greatly reduce scientists’ reliance on testimony. No researcher can possibly afford the time and cognitive resources to replicate all the results themselves, but must receive most of their scientific knowledge on trust. Nor is there anything irrational in this, as pointed out by social epistemologists.⁶⁵ All this seems to blur the distance between what Nieminen and colleagues present as scientific and religious rationality.

Based on the examples of the fine-tuning discussion and the discussion of scholarship and apologetics related to the historical Jesus, the discussion by Nieminen and colleagues is selective and does not address many important objections and contrary evidence that are prominent in the scholarly literature. Instead, they address only a selected portion of ideas, relying heavily on the work of a few authors who are critical of religious rationality, like Stenger and Carrier, while mostly not discussing the critical reception that these authors have received. Therefore, by fairly applying the same criteria that they themselves use to their own article, we would be forced to conclude that they themselves are exhibiting confirmation bias and experiential thinking. However, as noted, I think there are substantial difficulties in getting a hold of cognitive processes by analyzing texts, so I will also not conclude that Nieminen and colleagues’ article actually exhibits confirmation bias.

Towards a Better Model of Religious and Scientific Rationality

In the discussion on science and religion, the trend ever since John Hedley Brooke’s magisterial *Science and Religion: Some Historical Perspectives*⁶⁶ has been to emphasize the complexity of the relationship between science and religion. There is no single monolithic “religion” and no single monolithic “science” as personal entities, and so we also should probably not even try to attain to one general theory of the relationship between such a “religion” and “science,” but should instead try to form a more complex model that does justice to multiple different understandings of both.⁶⁷

Once we take into account a more complex understanding of what science and religion are, and also take into account that these are questions related to the philosophy of religion, it becomes apparent that there is no one “viewpoint of the scientific community” that Nieminen and colleagues could claim to represent on the issue of religious rationality. For example, there are plenty of scientists who see themselves as religious⁶⁸ and many who have themselves defended religious interpretations of evidence like fine-tuning. Indeed, many of those referenced by Nieminen and colleagues as simply “religious” thinkers, such as McGrath and Polkinghorne, also have excellent scientific credentials, as do Collins and Barnes. Other thinkers they cite as part of the scientific community’s perspective, such as Carrier and Stenger, represent minority viewpoints. This makes their talk of the “viewpoint of the scientific community” seem strange: Should only the scientists and scholars who agree with their viewpoint be counted among the scientific community?

Due to the plurality of religion and science, and the complexity of their relationship, there is no reason why integration should imply, for example, taking religious visions and testimonials as evidence for some putative scientific inference about God. Rather, the

dialogue will be between people, and representatives of different fields of research and intellectual traditions, with varying goals depending on the situation. There are many different forms of “religion” and “science” and dialogue or integration might be possible between some of them, and difficult between other forms. Thus it seems difficult to argue against all forms of integration using a generalizations like those used by Nieminen and colleagues’ model of the nature of religious thought.⁶⁹ To put it in simple terms, concluding that, say, Young Earth creationism does not provide a promising model for integrating science and religion⁷⁰ would not imply in any way that some of the many non-creationist models, such as various theologies of nature, creative mutual interaction⁷¹, or science-engaged theology⁷² could not work. Indeed, dialogue might be needed more, not less, to decrease the probability of errors in religious and anti-religious philosophical interpretations of science.

The situation is the same regarding the issue of rationality. While there may be some general unifying features of rational thinking, in practice rationality takes many forms and even different sciences have different criteria for what counts as good research.⁷³ And unless we adopt the idea of scientism—the belief that the sciences are the ultimate standard of rationality, or even the only way of knowing—then scientific forms of rationality also do not tell us the whole story.⁷⁴ Rather, we will end up with different criteria for rationality depending on the situation and area of study. As the old Aristotelian adage states, ways of knowing should be adapted to the object of knowledge.⁷⁵ As long as scientism is rejected, religious rationality and scientific rationality do not need to be the same in order for dialogue and even integration to be possible. Thus, for example, there may be situations in which retaining a non-committal attitude could be prudent (such as while doing an experiment in chemistry), but other situations in which a lack of commitment could be irrational (such as when trying to form a relationship to someone, attempting to solve the problems related to climate change, or searching to find the most meaningful way of living).⁷⁶

It is true that a lack of commitment is implied by some traditional accounts of scientific objectivity, which locate objectivity in personal psychology. However, there are also alternative accounts. For example, philosopher of science Inkeri Koskinen has defended a risk account of scientific objectivity, in which objectivity is the result of recognizing potential risks of bias and then attempting to reduce these risks.⁷⁷ According to Koskinen, the strategy of withholding epistemic judgment on the beliefs that one is studying can sometimes be a workable strategy for avoiding the effects of collective bias. However, at other times this strategy is clearly not possible, and would actually prevent research. Often the researcher will come to some conclusions on the beliefs studied, or has reason to hold beliefs about them already at the outset of their research. These beliefs could even be the reason why the researcher thinks that some question is worthy of study.⁷⁸ Understanding scientific objectivity as the lack of a strong personal opinion would not allow for objectivity in these cases at all, leaving many questions outside the realm of scientific study. However, Koskinen’s risk account is helpful here since on her account, the elimination of risk can be done in many different ways, not just by lacking a viewpoint on the issue. Instead, what is crucial for objectivity is that the risk is taken into account and eliminated *somehow*, rather than in one particular way.⁷⁹

It is likely that matters related to God and religion are inevitably going to be areas where any researcher will be hard pressed to remain fully neutral and noncommittal

in their epistemic and moral judgments. Our different experiences and starting points will also inevitably influence what we think about these things. This is a source of potential bias that does not apply only to religious believers, but to people of all persuasions.⁸⁰ For example, it is easy to agree with Nieminen and colleagues that a fervent Christian would be much less likely to consider a hypothesis of Jesus' nonexistence to be plausible and worth considering.⁸¹ (Although, so would the vast majority of scholars who have studied the evidence in detail, regardless of their view on Christianity.⁸²) It is not necessarily irrational to consider the plausibility of new ideas by contrasting them with the beliefs we already accept as true or probably true. This can also be just a benign part of intuitive human "plausibility checking" that we must all do every day.⁸³ Nevertheless, it is true that this intuitive heuristic can lead to biased and false conclusions, such as too readily accepting even poor arguments that seem to support one's own religious point of view. This also affects nonbelievers: for example, some fervent atheists might be inclined to uncritically accept even bad criticisms of theistic arguments, and uncritically believe in mythical stories of historical conflicts between religion and science.⁸⁴ So, these are risks that everyone needs to take into account.

Because the risk of bias seems unavoidable through lack of commitment and withholding epistemic judgments about religion entirely, this means that risks should be avoided using other means. One of these is the dialogue across a diverse set of viewpoints, and fostering a culture that allows for disagreements—which can certainly be seen in philosophy of religion journals and conferences. In a community that lacks pluralism, naming someone as a "devil's advocate" and fostering a culture of intellectual integrity could well be good ways of reducing epistemic risks. Instead of arguing for dispassionate detachment, increased commitment to intellectual virtues like humility and truthfulness seems a more fruitful approach for eliminating risk—since these virtues allow for the recognition of evidence that is against one's own position.⁸⁵ Fortunately, there exists much high quality work in the philosophy of religion by both believers and nonbelievers, demonstrating that detachment is not a requirement for producing such work. Many religious believers of various religions and views also do high quality work in the natural sciences and in the humanities, demonstrating that religious commitment does not prevent that either.

When making claims about the effects of bias on the philosophy of religion, it also needs to be noted that at least many of the potential factors increasing epistemic risks will also affect those who are not professional philosophers of religion. As Nieminen and colleagues themselves surely recognize, their comments on matters like the nature of religious rationality, the rationality of religious commitment and the possibility of meaningful religious language are also examples of philosophy of religion. The proposal that religious language should be scientifically testable in order to be meaningful has been discussed in various forms since the logical positivism movement, who argued that only statements that are empirically verifiable are meaningful.⁸⁶ But due to the many failures of positivism, such an argument for the meaninglessness of metaphysics and religious language has now been mostly abandoned in the philosophy of religion. Now it could be that it has been abandoned due to bias, but demonstrating this would require conversation with the commonly presented reasons for why such an account of meaningful religious language fails. Thus, the existence of potential bias should lead not lead us to dismiss what philosophers of religion have to say. Rather, it should lead us to seek

deeper integration between different perspectives, and to seek more dialogue on the relationship of science and religion.⁸⁷

Notes

1. Petteri Nieminen, Juuso Loikkanen, Esko Ryökäs and Anne-Mari Mustonen, “Nature of Evidence in Religion and Natural Science,” *Theology and Science* 18:3 (2020), 448–474.
2. *Ibid.*, 448.
3. *Ibid.*, 453.
4. *Ibid.*, 453–454.
5. *Ibid.*, 466–467
6. *Ibid.*, 466.
7. Lari Launonen, “Debunking Arguments Gain Little from Cognitive Science of Religion,” *Zygon: Journal of Religion and Science*, 5–7. Published online February 12, 2012. <https://doi.org/10.1111/zygo.12683>, discusses most of these four problems in more detail.
8. E.g. Robert N. McCauley, *Why Religion is Natural and Science is Not* (Oxford: Oxford University Press, 2011).
9. Justin L. Barrett, *Born Believers: The Science of Children’s Religious Belief* (New York: Free Press, 2012).
10. Paul Bloom, “Religious Belief as an Evolutionary Accident,” in *The Believing Primate: Scientific, Philosophical, and Theological Reflections on the Origin of Religion*, ed. Jeffrey Schloss and Michael J. Murray (New York: Oxford University Press, 2009), 118–127.
11. For an overview, see Launonen “Debunking Arguments.”
12. Michael J. Murray, “Scientific Explanation of Religion and the Justification of Religious Belief,” in *The Believing Primate: Scientific, Philosophical and Religious Reflections on the Origin of Religion*, ed. Jeffrey Schloss and Michael Murray (Oxford: Oxford University, 2009), 168–178. 171. Jonathan Jong, “Explaining Religion (Away?),” *Sophia* 52:3 (2013), 521–533.

For this reason, I have argued that the evidence from the cognitive sciences of religion does not even make it irrational to trust in religious intuitions about design in nature. See Kojonen, *The Compatibility of Evolution and Design* (London: Palgrave, 2021). Along similar lines, see also Mats Wahlberg, *Reshaping Natural Theology: Seeing Nature as Creation* (London: Palgrave Macmillan, 2012).

13. Michael Van Elk, B. Rutjens, J.V. Pligt and F.V. Harreveld. “Priming of Supernatural Agent Concepts and Agency Detection,” *Religion, Brain & Behavior* 6 (2016), 4–33. <https://doi.org/10.1080/2153599X.2014.933444>
14. David L.R. Majj, Hein T. van Schie, and Michiel van Elk, “The Boundary Conditions of the Hypersensitive Agency Detection Device: An Empirical Investigation of Agency Detection in Threatening Situations,” *Religion, Brain and Behavior* 9 (2019), 23–51.
15. Majj et al., “The Boundary Conditions,” and Neil Van Leeuwen and Michiel van Elk, “Seeking the Supernatural: The Interactive Religious Experience Model,” *Religion, Brain and Behavior* 9 (2019), 221–251. However, another paper provides some statistic support for the connection of religiosity and pareidolia. See T. Riekkki, M. Lindeman, M. Aleneff, A. Halme and A. Nuortimo, “Paranormal and Religious Believers Are More Prone to Illusory Face Perception than Skeptics and Non-Believers,” *Applied Cognitive Psychology* 27:2 (2013), 150–155. <https://doi.org/10.1002/acp.2874>
16. Murray, “Scientific Explanation of Religion.”
17. Justin Barrett, “The Relative Unnaturalness of Atheism: On Why Geertz and Markusson Are Both Right and Wrong,” *Religion* 40:3 (2010), 169–172.
18. Nieminen et al., “Nature of Evidence,” 449–450. Furthermore, religious detection of design in nature has often also been formulated as an argument, utilizing both intuitive and reflective thinking. For example, related to the Intelligent Design movement, see Kojonen, *The Intelligent Design Debate and the Temptation of Scientism* (London: Routledge, 2016),

- 107–148. It is intriguing that in the discussion of how the cognitive science of religion has impacted the rationality of religious belief, scientists Barrett and Jong have defended the rationality of intuitive thinking, whereas philosophers Visala and Leech defend the importance of reflective reasons for religious belief. See Kelly James Clark and Justin Barrett, “Reidian Religious Epistemology and the Cognitive Science of Religion,” *Journal of the American Academy of Religion* 79:3 (2011), 639–675; Jong, “Explaining Religion,” and David Leech and Aku Visala, “The Cognitive Science of Religion: A Modified Theist Response,” *Religious Studies* 47:3 (2011), 301–316.
19. Hugo Mercier and Dan Sperber, *The Enigma of Reason: A New Theory of Human Understanding* (Cambridge, MA: Harvard University Press, 2017), Chapter 9. Philosophers and scientists do attempt to test and improve our intuitive heuristics concerning rationality and explanatoriness, but this itself does rely on intuitions.
 20. Leech and Visala, “The Cognitive Science of Religion.”
 21. Olli-Pekka Vainio, “What Does Theology Have to Do With Religion? Dual-Process Accounts, Cognitive Science of Religion and a Curious Blind Spot in Contemporary Theorizing,” *Open Theology* 2 (2016), 106–112. 111. The same conclusion is also reached by Miguel Farias, Valerie van Mulukom, Guy Kahane, Ute Kreplin, Anna Joyce, Pedro Soares, Lluís Oviedo, Mathilde Hernu, Karolina Rokita, Julian Savulescu and Riikka Möttönen, “Supernatural Belief Is Not Modulated by Intuitive Thinking Style or Cognitive Inhibition,” *Scientific Reports* 7:1 (2017), 15100. <https://doi.org/10.1038/s41598-017-14090-9>.
 22. Kim Sterelny, “Religion Re-Explained,” *Religion, Brain & Behavior* 8 (2018), 406–425. <https://doi.org/10.1080/2153599X.2017.1323779>, and Van Leeuwen and Van Elk, “Seeking the Supernatural.”
 23. M. Andersen, “Predictive Coding in Agency Detection,” *Religion, Brain & Behavior* 9 (2019), 65–84. <https://doi.org/10.1080/2153599X.2017.1387170>.
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 25. *Ibid.*, 458.
 26. *Ibid.*, 455.
 27. *Ibid.*
 28. *Ibid.*, 456–458.
 29. *Ibid.*, 459.
 30. *Ibid.*, 467.
 31. E.g. McLeish, Tom, *Faith and Wisdom in Science* (Oxford: Oxford University Press, 2014).
 32. Victor Stenger, *The Fallacy of Fine-Tuning: Why the Universe Is Not Designed for Us* (Amherst, NY: Prometheus Books, 2011), and Victor J. Stenger, “Defending the Fallacy of Fine-Tuning,” Unpublished paper, arXiv:1202.4359. 2012. Available at <https://arxiv.org/abs/1202.4359>.
 33. Nieminen et al., “Nature of Evidence,” 457.
 34. *Ibid.*, 457.
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 36. William Lane Craig, “Five Reasons to Believe in God,” in *Understanding Arguments: An Introduction to Informal Logic*, ed. Walter Sinnott-Armstrong and Robert Fogelin, 9th ed. (Stamford, CT: Cengage Learning, 2015), 450–455. Referenced by Nieminen et al., “Nature of Evidence,” note 36.
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 42. Stenger, “Defending the Fallacy,” referenced in Nieminen et al., “Nature of Evidence,” note 48.
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 45. Collins, “The Teleological Argument”; Barnes, “Fine-Tuning in the Context of Bayesian Theory Testing,” *European Journal for Philosophy of Science* 8:2 (2018), 253–269; Luke A. Barnes, “A Reasonable Little Question: A Formulation of the Fine-Tuning Argument,” *Ergo: An Open Access Journal of Philosophy* 6 (2019). <https://doi.org/10.3998/ergo.12405314.0006.042>
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 47. Nieminen et al., “Nature of Evidence,” 467.
 48. *Ibid.*
 49. E.g. Tom Holmén and Stanley E. Porter, eds., *Handbook for the Study of the Historical Jesus* (4 vols) (Leiden: Brill, 2011); Craig A. Evans, ed., *The Routledge Encyclopedia of the Historical Jesus* (London: Routledge, 2014).
 50. Nieminen et al., “Nature of Evidence,” 455.
 51. *Ibid.*, 455, referencing Carrier 2012, 124–169.
 52. A classic statement along these lines can be found in John P. Meier, *A Marginal Jew: Rethinking the Historical Jesus: Volume 1: The Roots of the Problem and the Person*. Anchor Bible Reference Library Series. Reissued ed. (New York: Yale University Press, 1991), 168. The lives of mythical heroes were told as entertainment for purposes like political and philosophical commentary. This is quite different from the early Christians, who wanted people to believe in Jesus as the true Son of God, and in the Church as his community.
 53. Tom Holmén, “Authenticity Criteria,” in *The Routledge Encyclopedia of the Historical Jesus*, ed. Craig A. Evans (London: Routledge, 2010), 43–54; C. Keith, “The Narratives of the Gospels and the Historical Jesus: Current Debates, Prior Debates and the Goal of Historical Jesus Research,” *Journal for the Study of the New Testament* 38:4 (2016), 426–455.
 54. Nieminen et al., “Nature of Evidence,” 455.
 55. For example, the embarrassing nature of the crucifixion is often discussed in both early Christian texts such as Paul’s letters and is also present in pagan critical responses to Christianity.
 56. For example, Loke, Andrew. *Investigating the Resurrection of Jesus Christ: A New Transdisciplinary Approach*. Routledge New Critical Thinking in Religion, Theology and Biblical Studies (London: Routledge, 2020); and Michael Licona, *The Resurrection of Jesus: A New Historiographical Approach* (Downer’s Grove, IL: IVP Academic, 2010).
 57. Nieminen et al., “Nature of Evidence,” 451–455.
 58. *Ibid.*, 455.

59. Ibid., 452.
60. Ibid.
61. This is particularly common in religious apologetics for the resurrection of Jesus. E.g. Loke, *Investigating*, Licon, *The Resurrection*.
62. E.g. Max Baker-Hytch, "Testimony amidst Diversity," in *Knowledge, Belief, and God: New Insights in Religious Epistemology*, ed. Matthew A. Benton, John Hawthorne and Dani Rabinowitz (Oxford: Oxford University Press, 2018), 183–202, and Vainio, *Disagreeing Virtuously: Religious Conflict in Interdisciplinary Perspective* (Grand Rapids, MI: William B. Eerdmans Publishing Company, 2017).
63. E.g. Linda Trinkaus Zagzebski, *Epistemic Authority: A Theory of Trust, Authority and Autonomy in Belief* (Oxford: Oxford University Press, 2012); Mats Wahlberg, *Revelation as Testimony: A Philosophical-Theological Study* (Grand Rapids, MI: Eerdmans, 2014), and Baker-Hytch, "Testimony amidst Diversity."
64. Nieminen et al., "Nature of Evidence," 462.
65. Miranda Fricker, Peter J. Graham, David Henderson and Nikolaj J.L.L. Pedersen, eds., *The Routledge Handbook of Social Epistemology* (London: Routledge, 2019); for the discussion of psychological factors see e.g. Mercier, *Not Born Yesterday: The Science of Who We Trust and What We Believe* (Princeton, NJ: Princeton University Press, 2020).
66. John Hedley Brooke, *Science and Religion: Some Historical Perspectives* (Cambridge: Cambridge University Press, 1991).
67. Peter Harrison, *The Territories of Science and Religion* (Chicago, IL: University of Chicago Press, 2015); Mikael Stenmark, *How to Relate Science and Religion: A Multi-Dimensional Model* (Grand Rapids, MI: Wm. B. Eerdmans Publishing Co, 2004).
68. Elaine Howard Ecklund, *Science vs Religion: What Scientists Really Think* (Oxford: Oxford University Press, 2010).
69. Nieminen et al., "Nature of Evidence," 453–454, 467.
70. Ibid., 463, 467.
71. Robert J. Russell, *Cosmology from Alpha to Omega: The Creative Mutual Interaction of Theology and Science* (Minneapolis, MN: Fortress Press, 2008).
72. John Perry and Joanna Leidenhag, "What Is Science-Engaged Theology?" *Modern Theology* 37:2 (2021), 245–253.
73. McGrath, *The Territories of Human Reason: Science and Theology in an Age of Multiple Rationalities* (Oxford: Oxford University Press, 2018); see also e.g. Stenmark, *Rationality in Science, Religion and Everyday Life: A Critical Evaluation of Four Models of Rationality* (Notre Dame, IN: University of Notre Dame Press, 1995).
74. On this see Jeroen De Ridder, Rik Peels and René van Woudenberg, eds., *Scientism: Prospects and Problems* (Oxford: Oxford University Press, 2018).
75. William Abraham, "Introduction," in *The Oxford Handbook of the Epistemology of Theology*, ed. William J. Abraham and Frederick D. Aquino (Oxford: Oxford University Press, 2017).
76. The issues of the rationality of religious commitment in relation to many examples are discussed in depth by Robert Audi, *Rationality and Religious Commitment* (Oxford: Oxford University Press, 2012).
77. Koskinen, "Defending a Risk Account of Scientific Objectivity," *British Journal for the Philosophy of Science* 71:4 (2018), 1187–1207. <https://doi.org/10.1093/bjps/axy053>
78. H. Chang, "We Have Never Been Whiggish (About Phlogiston)," *Centaurus* 51 (2009), 239–264, 253. Quoted in Koskinen, "Objectivity in Contexts: Withholding Epistemic Judgement as a Strategy for Mitigating Collective Bias," *Synthese* 12. <https://doi.org/10.1007/s11229-020-02645-9>.
79. Koskinen, "Objectivity in Contexts." For a broader overview on scientific objectivity, see Reiss, Julian & Jan Sprenger, "Scientific Objectivity," in *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta, Winter 2020 ed. Available at <https://plato.stanford.edu/archives/win2020/entries/scientific-objectivity/>.
80. This was the conclusion of many following the article by Paul Draper and Ryan Nichols, "Diagnosing Bias in Philosophy of Religion," *Monist* 96 (2013), 420–446, which is cited

- by Nieminen et al., “Nature of Evidence,” 467. See e.g. Helen De Cruz, “Religious Beliefs and Philosophical Views: A Qualitative Study,” *Res Philosophica* 95:3 (2018), 477–504.
81. Nieminen et al., “Nature of Evidence,” 467.
 82. See e.g. Evans, “The Routledge Encyclopedia of The Historical Jesus.”
 83. Mercier, “Not Born Yesterday.”
 84. There are plenty of examples of non-religious, as well as religious motives distorting views of this history. See, for example, many of the cases discussed in Ronald Numbers, ed., *Galileo Goes to Jail and Other Myths about Science and Religion* (Cambridge, MA: Harvard University Press, 2009), and Derrick Peterson, *Flat Earths and Fake Footnotes: The Strange Tale of How the Conflict of Science and Christianity Was Written Into History* (Eugene, OR: Cascade Books, 2021). For easily accessible evidence, see the “History for Atheists” blog (<https://historyforatheists.com/>) by historian Tim O’Neill, which frequently correct historical myths believed and propagated by atheists. O’Neill is himself also an atheist.
 85. Vainio, *Disagreeing Virtuously*.
 86. Nieminen et al., “Nature of Evidence,” 464–465. On religious language see particularly Vainio, *Religious Language*. Cambridge Elements (Cambridge: Cambridge University Press, 2020), chapter 1; Nicholas Wolterstorff, “How Philosophical Theology Became Possible within the Analytic Tradition of Philosophy,” in *Analytic Theology*, ed. O.D. Crisp and M.C. Rea (Oxford: Oxford University Press, 2009), 155–170, and Keith Yandell, “Religious Language,” in *The Routledge Companion to Theism*, ed. C. Taliaferro, V.S. Harrison, and S. Goetz (London: Routledge, 2013), 355–368. Many traditional critiques against logical positivism also seem to apply against falsifiability as a criterion of meaning: (1) the criterion does not meet its own requirement of meaningfulness, (2) we need to be able to make moral truth claims, even though these are not falsifiable, (3) it is possible to formulate scientific hypotheses about matters like the multiverse, where we currently have no way off falsification, but the claims are still not nonsensical, and (4) science also allows for claims that are not directly testable, but are only testable with the addition of auxiliary claims. Even if these can be responded to, utilizing the criterion of falsifiability should still not lead to a naïve falsificationism in which broad theories or worldviews are expected to be falsifiable by simple experiments. To take a concrete example of this, the studies cited by Nieminen et al., “Nature of Evidence,” 465 in which no causal relationship between prayer and healing was visible does not seem sufficient to falsify the idea that God answers prayer—only the idea that God does this in an easily predictable way. But this hypothesis was falsified by common religious experience already long before these studies.
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