

DIVINE EXPECTATIONS

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ABSTRACT: Bayesian arguments have come to play an important role in the debate over theism. They offer clarity, precision, and the ability to reckon the impact of disparate pieces of evidence. But there is a devil in the details: given the infinity of possible creations, natural axiological constraints on creation grind the mathematical gears of Bayesianism to a halt. In this chapter, I outline the conflict, sketch its depth by exploring various unhelpful retreats, and conclude that unless a somewhat specific axiology holds – one in which there are unsurpassable worlds and worlds-by-goodness are well-modeled by the reals – the technical burden for using Bayesian tools in the theism debate is not met.

1 INTRODUCTION

Recent decades have seen a Bayesian turn in the philosophy of religion, especially in arguments for/against theism. An early driver of this was Richard Swinburne, especially in his *The Existence of God* [1979]. Since then, many venerable arguments have received Bayesian reformulations, including design arguments: most clearly in the form of fine-tuning arguments,¹ arguments from morality (especially moral knowledge),² arguments from reason,³ arguments from miracles,⁴ the argument from evil,⁵ and the argument from divine hiddenness.⁶ Newer arguments like those from nomological⁷ and psychophysical harmony⁸ are also often cast in Bayesian terms.

In simplified form, Bayesian arguments work as follows. First, we take the prior probability of a theory – either its ur-prior or its probability relative to some fixed background knowledge. Then we look at how probable our new evidence is absolutely and how probable it is given that theory – roughly, how well the theory predicts the evidence. These together via the equation known as Bayes' Theorem tell us the theory's posterior probability – roughly, how likely the theory is after accounting for the evidence. This in turn tells us whether the evidence constitutes an argument for or against the theory, and if so how strong in an absolute sense.

¹ See Collins [2009], Hawthorne & Isaacs [2018].

² McKay [2023].

³ Plantinga [2002].

⁴ McGrew & McGrew [2009].

⁵ Draper [2008], [2025].

⁶ Anderson & Russell [2025].

⁷ Cutter & Saad [Forthcoming].

⁸ Cutter & Crummett [2025].

Often, what we are interested in is not just the impact of some evidence on a theory, but in the impact of some evidence on the likelihood ratio of some theory and its competitor(s). For this purpose, the odds and relative odds forms of Bayes' Theorem are especially illustrative. Usually, in the theism debate, the relevant comparison is between some form of perfect being theism (and occasionally a specific theistic religion, usually an Abrahamic one) and naturalism. Since these do not form a partition, the right equation is the relative odds form, which goes like this:

$$\frac{P_1(H_1)}{P_1(H_2)} \times \frac{P_1(E|H_1)}{P_1(E|H_2)} = \frac{P_2(H_1)}{P_2(H_2)}$$

This tells us that the posterior odds ratio is controlled by two things: the relative priors and the extent to which the two theories predict the evidence. If we wish to account for the impact of multiple pieces of evidence, we can extend the equation in the natural way.

$$\frac{P_1(H_1)}{P_1(H_2)} \times \frac{P_1(E_1|H_1)}{P_1(E_1|H_2)} \times \dots \times \frac{P_1(E_n|H_1)}{P_1(E_n|H_2)} = \frac{P_2(H_1)}{P_2(H_2)}$$

The overall evidential case for/against H_1 relative to H_2 and vice-versa thus depends crucially on our ability to assign probabilities to our various pieces of evidence given those theories. Without that, the equation falls silent or goes permissive/mushy. If our argument is to be more than autobiography, this assignment must be constrained in various ways by substantive rationality, beyond the norms of probabilism and conditionalization. And yet, I will argue, the natural way of doing this for theism is at odds with the natural structural constraints on rational expectations. This is true if we accept probabilism, and it remains true even if we abandon probabilism for a fairly minimal qualitative fallback. Thus, it looks like Bayesian machinery is not well-suited for making arguments in the debate over theism.

2 EXPECTING DIVINE ACTION

According to perfect being theism, God is the world's creator. Whether this entails meticulous control over every aspect of the world or only a very powerful ability to influence what happens is a matter of some debate but is a complication that we can ignore in what follows,⁹ so I will assume that God creates by choosing which world will be actual. Thus, in order to determine the probability of various E s given theism, we need to know how to set our expectations about which world God would actualize. Without such expectations, there is very little we can say about theism in a Bayesian setting.¹⁰

The primary setting for most of the theistic and naturalistic arguments we are considering is natural-theological. That is, the relevant expectations should be informed by philosophical concerns, not things like special revelation. The theism at stake is usually a generic theism that does not supplement the

⁹ For dissent, see Page [2022]. I think the distinction between meticulous providence and merely powerful influence amounts to the difference between choosing a specific possible world to be actual and choosing a lottery over some set of worlds the outcome of which (which we can think of as the cumulative effect of non-providential agency and/or chance) determines which world is actual. I will not be countenancing models where there is no actual world.

¹⁰ Climenhaga [2025b] makes this point in a fair amount of details while discussing skeptical responses to the argument from evil.

hypothesis that God exists with the claims of various particular religions. This has the advantage of getting a higher prior probability but sacrifices explanatory/predictive power. We have mostly the three omnis – omniscience, omnipotence, omnibenevolence – to work with.

These first two serve primarily to expand the menu of options available to God. There is nothing God lacks the power or knowledge to do, except that which cannot be done. Consequently, we have two primary sources for narrowing our expectations about what kind of world theism predicts. Deontology and Axiology. Plausibly, omnibenevolence bans violating side constraints, if any there be.¹¹ Thus, a rational expectation function will assign 0 weight to any world containing the violation of a creator's side constraint given theism, and it will furthermore assign 0 weight to any set of worlds all of which contain the violation of a creator's side constraint given theism.

Once Deontology has spoken, there remains quite a lot to say. There are many ways of creating a world without violating side constraints. Some of those ways will be better, and some of those ways will be worse. This is where Axiology takes over. For now, we will assume that Axiology is simple and provides us with a total ranking of worlds by the betterness relation \preceq that is reflexive and transitive.¹² Intuitively, if $W_1 \preceq W_2$, then W_2 is at least as good as W_1 by axiological standards. We can define strict betterness \prec and interchangeability \approx in the usual ways.

We will then have Axiology inform our expectations as follows: the better a world, the more we should expect God to actualize it. In other words, if $W_1 \preceq W_2$, then the weight of our expectation that W_1 is actual given theism proportionately exceeds the weight of our expectation that W_2 is actual given theism.

2.1 THE BASIC PROBLEM

We now have two rules for our expectations for which world is actual, given theism. The first says that worlds the creation of which violates some deontic norm binding on the creator get weight of 0. The second says that if and only if Axiology tells us that $W_1 \preceq W_2$, the weight of W_1 is proportionately \leq the weight of W_2 . These are substantive principles of rationality. In order to get a full picture of what rational expectation we should have about what theism predicts (and consequently how to fill in the Bayesian equations), we must combine them with the structural principles that govern rationality.

The most important structural principle of rationality is known as *probabilism*. Probabilists say that rational expectation functions must be probability functions. There are numerous arguments for this conclusion: Cox's theorem lays down some qualitative axioms governing plausibility and shows that these require probabilism.¹³ Dutch Book arguments show that anyone whose expectation function is not a probability function will willingly take a series of bets that amount to a sure loss.¹⁴ Accuracy-Dominance Arguments show that anyone whose expectation function is not a probability function is

¹¹ There is debate on this point: the majority report favors some divine obligations; see Adams [1999] and Rubio [2018], [2023] for the case against.

¹² For defenses of the so-called 'trichotomy thesis,' see Broome [1998], [2022] and Elson [2022].

¹³ Cox [1946]

¹⁴ Maher [1996] and Christensen [1997].

less accurate come what may than some other expectation function that is a probability function, but not so if their expectation function is a probability function.¹⁵

Probability functions can be axiomatized following Kolmogorov as functions from a σ -algebra of events built out of an underlying sample space Ω to the real numbers that obey (1)-(3):

- 1) NON-NEGATIVITY: $\forall \phi \ p(\phi) \geq 0$
- 2) NORMALIZABILITY: $p(\top) = 1$
- 3) ADDITIVITY: if $\phi_1, \dots, \phi_n, \dots$ are disjoint, $p(\bigcup_{i=1}^{\infty} \phi_i) = \sum_{i=1}^{\infty} p(\phi_i)$

There is some dispute over whether ADDITIVITY should apply to countable unions or only to finite unions, although the general consensus favors countable additivity.¹⁶

We can think of the possible worlds as our sample space. Very likely, this sample space is infinite. Most approaches to modal plenitude deliver an infinity of possible worlds – perhaps a very large one. In the name of simplicity and tractability, I am going to assume that this space is either well-modeled by the natural numbers or by the real numbers. A failure of this assumption (other than for cardinality reasons) would itself be interesting.

2.1.1 THE COUNTABLE CASE

We'll begin with the countable case. Then we can think of our axiological constraint on rational expectations as having the following upshot, where ϕ is the event of creating W_1 , ψ is the event of creating W_2 : $W_1 \preceq W_2$ proportionately to how much $p(\phi) \leq p(\psi)$.

There are then three possibilities, depending on how \preceq looks. Possibility 1: there is a unique best world, some W s.t. $V \preceq W$ for all V . Possibility 2: there is a class of unsurpassable worlds W_u , where each of the $W_u \preceq$ each other, they all \succeq every world outside the W_u , and any world that \succeq one of the W_u is another of the W_u . Possibility 3: every world is surpassable, so each for each world W_i , there exists another world W_i^+ s.t. $W_i^+ \succeq W_i$ but not vice versa.

If possibility 3 obtains, our expectation cannot be a probability function. In this case, our expectation of each world will be higher than the previous one as we go up the goodness ordering. Axiology calls for us to sum a series with an ever-increasing tail, and calculus tells us that such sums always diverge.

If possibility 2 obtains, our expectation cannot be a probability function. In this case, our expectations will climb through the set of surpassable worlds until we hit the unsurpassable worlds and will then be evenly distributed among them. Let $1-n$ be the aggregate probability assigned to the surpassable worlds, and let n be the probability assigned to the unsurpassable worlds. We now have three subcases. Subcase 1: finitely many surpassable worlds, infinitely many unsurpassable worlds. Subcase 2: infinitely many surpassable worlds, finitely many unsurpassable worlds. And subcase 3: infinitely many of both. Since we are assuming an infinity of worlds, there cannot be finitely many of both. I suspect the best subcase

¹⁵ Joyce [1998], [2009]; Fitelson and Easwaran [2015]; Leitgeb and Pettigrew [2010a], [2010b]; and Pettigrew [2016].

¹⁶ Easwaran [2013] defends countable additivity. Seidenfeld et al. [Forthcoming] offer a rejoinder.

is 3, based on the argument from trivial variants.¹⁷ Given a description of a world, we can vary it in trivial ways (e.g. by adjusting someone's height or favorite number) that quickly lend themselves to the production of infinities.

If subcase 1 obtains, then $1-n$ must be divided between finitely many worlds that increase up to the unsurpassability point. No problem. But then n must be divided between infinitely many worlds. There is no way to do this. An infinite countable sum of 0s is equal to 0, and an infinite countable sum of any other number will diverge.

If subcase 2 obtains, then n must only be divided evenly between finitely many worlds. No problem. But now $1-n$ must be divided among infinitely many worlds that increase up to the unsurpassability point. There is no way to do this. Even if an ever-increasing sum has a finite upper bound, the series of partial sums will grow without limit.

If subcase 3 obtains, we must combine the problematic aspects of subcase 1 along with those of subcase 2. Thus, Axiology makes demands that calculus tells us we cannot satisfy.

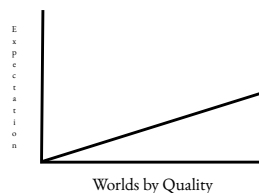
That leaves possibility 1. Possibility 1 is equivalent to subcase 2 under possibility 2, where the finite number of unsurpassable worlds is 1. Consequently, the same problems will apply.

The upshot: if the structure of worlds by goodness resembles the natural numbers, then our expectation for which world God would create cannot satisfy both the Axiological constraint and Probabilism. Of course, this is a significant assumption.

2.1.2 THE UNCOUNTABLE CASE¹⁸

We might instead think of the way goodness orders the worlds as analogous to the reals. In this case, the proper tool is not a probability mass function, as before, but a probability density function. This technical change has significant upshots, although the basic trilemma remains. We have three possibilities for the shape of our expectation, depending on whether and how many unsurpassable worlds there are. These remain: possibility 1, a unique best world; possibility 2, a class of unsurpassable worlds all tied for best; possibility 3, no unsurpassable worlds.

If possibility 3 obtains, Axiology requires us to have a function that is ever increasing with world quality.

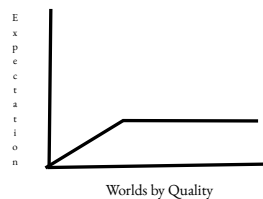


¹⁷ See Rubio [2020], [2025a].

¹⁸ Thanks to Dan Linford for helpful comments that have informed the discussion in this section.

Whether calculus allows this turns on a question that is not often addressed in axiology. If the increase in our function is unbounded, then it will not be normalizable and consequently will violate COUNTABLE ADDITIVITY.¹⁹ However, if there is an upper bound to world quality, then we have no problem. This raises the question: is there an upper bound to world quality? I will return to this question once we have spelled out the other cases.

If possibility 2 obtains, our expectation of each world in the class of unsurpassable worlds W_u should be equal. This will result in a function that is constant to the right. This is viable. There are many normalizable density functions with the correct behavior. Thus, if we assume both that there are unsurpassable worlds and that the structure of worlds by goodness resembles the reals, we can harmonize Axiology with Probabilism. There is a fierce debate about whether there could be an unsurpassable world.²⁰ It is at least interesting and surprising that the fate of Bayesian arguments in philosophy of religion may be hostage to its outcome.



This leaves option 1. Option is not very plausible. Even recent defenses of ‘best world’ theism tend to go for an unsurpassable world, rather than a unique best. Furthermore, if option 1 is the case, all we need to decisively disprove theism is to find one aspect of our world that would not be present in the unique best world. There is no technical problem here, but it probably ends the theism debate swiftly and decisively in favor of atheism.

The upshot: creating an expectation function suitable for Bayesian arguments about theism is surprisingly tricky. Additivity failures loom. But axiology may not be simple. Will complicating it help?

2.1.3 EXCURSUS ON BOUNDED VALUE

As we saw, whether or not Axiology and Probabilism can be harmonized may depend on the significant assumption that there are unsurpassable worlds. This in turn depends on whether or not world quality can grow without bound. While there has been significant discussion of whether there is a best world, or whether there is an unsurpassable world, there has been less discussion of whether world quality faces an upper bound.²¹ This could still occur even if every world is surpassable.

¹⁹ For a relevant discussion of the mathematical issues, although in a different context (that of fine-tuning), see McGrew, McGrew, and Vestrup [2001].

²⁰ Highlights include Pruss [2016], Climenhaga [2018], Johnston [2019], Rubio [2020], Climenhaga [2025a], Rubio [2025a].

²¹ Schlesinger [1964] is an exception.

When we ask whether world-value is bounded, we are asking about the shape of the aggregation function which takes entire worlds as inputs and returns some representation as output standing for their value. Our assumption has been that these representations can be treated like numbers for the purpose of assigning expectation values to God creating them. They may not be treatable like numbers for all purposes, so we are not assuming that they *are* numbers.

Axiologists draw a distinction between intrinsic value and extrinsic value. Intrinsic value is the value a thing has in virtue of how it is in itself, or how it is intrinsically. Extrinsic value is all other value. Examples of sources of intrinsic value may include things like shape and mass (classic intrinsic properties) as well as things like dignity or the quality of an experience (e.g. pleasure and pain). Examples of sources of extrinsic value include things like uniqueness, diversity, organic unity, and place in arrangements like artistic or narrative structures.

The overall value aggregation function that distills all of these things down to a single representer must be horrendously complicated. Fortunately, we do not need to hypothesize about it too strenuously to make a case against bounded value for worlds. Instead, we will direct our attention to intrinsic value alone. If we can argue that intrinsic value aggregates without bound, we then need only argue that there need not be countervailing extrinsic value to pull arbitrary collections of intrinsically valuable things down below the “bound point.”

Our argument begins with the aggregation of intrinsic value. And this, I will argue, is at least summative. Define a summative aggregation function as one for which the aggregate value of the x s is at least the sum of the values of the x s. I will operate on the assumption that value sums make sense. We can then define a function that is at least summative as one where the aggregate value of the x s is at least the sum of the x s. This makes the claim that a function is at least summative strictly weaker than the claim that it is summative.

Why think intrinsic value is at least summative?²² The first point to make is that an object’s intrinsic value does not appear or disappear when entirely distinct objects appear or disappear. This is just a consequence of it being an intrinsic property. Intrinsic properties in general are those whose presence does not counterfactually depend on distinct objects.²³ Thus, if object 1 contributes m intrinsic value to the world, and object 2 contributes n , then the world contains at least $m + n$ intrinsic value, and nothing can make that different. To argue that the world’s intrinsic value nevertheless aggregates to less than $m + n$ intrinsic value would require giving a reason that the two objects contribute less than their total

²² The suggestion that intrinsic value is summative may be found in other places in the literature, e.g. Davison [2012] and Oddie [2001].

²³ A nuance: it is false in general to say that intrinsic properties do not depend *full stop* on entirely distinct objects. Paradigmatically intrinsic properties of derivative objects like their shape may well depend on distinct fundamental objects. But these objects will in general be metaphysically multiply realizable, so that if the fundamentalia on which their intrinsic properties actually depend did not exist, some other fundamentalia would play the same role, so their possession of the intrinsic properties will not *counterfactually* depend on the actual fundamentalia. The ‘counterfactual’ in the claim of counterfactual dependence is load-bearing. See Rubio [2025b] for further discussion on the topic of intrinsic value specifically.

intrinsic value to the aggregate of the intrinsic value present in the world as a whole, and any such reason will be tainted with extrinsicity.

The next point is about what kinds of possibilities are out there. We'll begin with a very simple world – say, one that contains a silver spoon and nothing else.²⁴ If you don't think silver spoons are intrinsically valuable at all, pick something that you think is. This world will contain m intrinsic value, whatever the spoon contributes, plus whatever extrinsic value (e.g. uniqueness) the spoon possesses in virtue of being alone and its other extrinsic features. Next, we consider a slightly more complicated world. This one contains two silver spoons, which stand in no relations to each other.²⁵ By the at-least-summativity of intrinsic value, this world should contain $2m$ intrinsic value. Its overall value my shift in difficult to predict ways as various sources of extrinsic value make their contributions (e.g. uniqueness, organic unity, diversity, etc). But the intrinsic value will provide a baseline of $2m$ from which to operate. To get that worlds can be at least $2m$ valuable, we need only that the extrinsic value contribution in this scenario (two intrinsically valuable objects that stand in no non-trivial (e.g. co-existence, counting) relations to each other) not go negative.²⁶

By repeated application of similar arguments, we should get: a world with k silver spoons has km intrinsic value, +/- the extrinsic value. If we continue making our worlds very simple (e.g. by avoiding other kinds of object and relations beyond those logically required by the existence of the spoons), the extrinsic value contribution should not go negative, and so we should have a 'ladder' of possibilities with height k where the n_i th element of the ladder has at least n_i value.

This delivers a significant subconclusion. As long as the number of intrinsically valuable objects a world could contain is unbounded, then the baseline intrinsic value that a world could contain is unbounded. As long as we can construct worlds teeming with objects while avoiding net negative extrinsic value, then the value of worlds is unbounded. That was the desired conclusion.

This naturally raises the question of how many things there could be in a world. And the most plausible answer to this question is: indefinitely extensibly many. Capping the possible number of things at some cardinal number is unacceptably arbitrary, and allowing so many things that they can be put into 1:1 correspondence with the cardinals leads to paradox.²⁷

Combining all elements: an at-least-summative intrinsic value aggregation function combined with a metaphysics that answers the question “how many things could there be?” with “indefinitely extensibly many” yields a “ladder” of worlds whose value increases without bound. This construction is plausible,

²⁴ Or a silver spoon + God, but God will be inert in the string of possibilities we are about to entertain, so unless we adopt a view where God's value saturates the value of the world so that nothing can make a world more or less valuable, we can safely talk only of the created world. Since we are entertaining an endlessly-improving string of worlds, we have already ruled out this scenario.

²⁵ Outside of Lewisian modal realism, I don't see why this assumption should be problematic. It is no different structurally from Max Black's [1952] world of homogenous iron spheres.

²⁶ These items will be duplicates, and perhaps that is axiologically relevant. It certainly decreases any positive value from uniqueness. But I see no reason why the fact of duplication should make a negative extrinsic value contribution – at worst, it should approximate 0.

²⁷ For further discussion see Hawthorne and Uzquiano [2011], Menzel [2014], Rubio [2020], and Werner [2025].

and shows that a strategy for modeling divine creation of worlds under the assumption that all of them are surpassable that adverts to bounded values faces significant headwinds.²⁸ Now, on to other retreats.

2.2 AXIOLOGICAL COMPLICATIONS

Recent work on ‘hard choices’ has made it plausible that there is more to axiology than the ‘trichotomy’ relations of better than, worse than, and equivalence.²⁹ The two most common candidates for additional axiological relations are *incomparability* and *parity*.³⁰ Two items are incomparable just in case there is no axiological relation between them. Neither is better. Neither is worse. They are not equivalent. Nothing more may be said about the comparison of their value. Incomparability is strong, because it is infectious. If A and B are incomparable, then anything comparable to A is incomparable to anything comparable to B. It creates wholly distinct “galaxies” of value.

Less extreme is the relation of parity. According to Ruth Chang, two items are on a par when the following condition obtains: there is magnitude to their axiological difference, but it does not tell in favor of one or the other. This requires some unpacking. Chang breaks down axiological difference into two components. Magnitude tells you *how far apart* two options are. *Bias* tells you which option the difference favors. Parity occurs, she argues, when the difference has magnitude but not bias.

What kinds of cases does parity aim to address? Consider the question: who was more creative, Mozart or Michelangelo? It seems wrong to say that either was more creative. But if the answer is ‘they are equally creative,’ then making one of them an iota more or less creative would render the other less or more creative. That seems wrong too. This follows a common pattern when items are on a par: small sweetenings tend not to break parity. Large sweetenings, on the other hand, do break parity. If you make Mozart significantly more creative, then it is plausible to say that he is more creative than Michelangelo. This shows that the two are not incomparable, since incomparability persists through large sweetenings as well as small ones.

Our expectation of the preferences of agents who regard some goods to be either incomparable or on a par and whose preferences perfectly track axiological relations cannot be probability functions. If someone regards two items as incomparable, then we should not expect them to value one or the other

²⁸ A line of objection due to Mark Murphy: suppose you regard value as resemblance to the good (e.g. God). Then the value of God sets a natural bound to how good a world could get. Assuming that God is in all of the worlds and that aggregating God’s value is kosher, that yields $2G$ where G is the value of God as a bound on the goodness of a world. This is a nice objection, but I think it fails. The goal of setting a bound to worldly value is to make the worlds as ordered by goodness well-modeled by bounded intervals of real numbers. Functions restricted to $[0, 1]$ can only increase so much before running into the bound 1. By contrast, while larger cardinal infinities (e.g. beth-2) serve as upper bounds in some sense for the reals, they do not prevent real-valued functions from “unbounded” growth. In our situation, we may assign the value of God a representation like the first inaccessible cardinal while restricting the value of created things to cardinals that provably exist in ZFC.

²⁹ See Raz [1986, ch. 13], Chang [2002], [2016], [2017], and Pruss [2016].

³⁰ Many writers speak also of *incommensurability*. In my preferred usage, two options are incommensurable when they are not comparable on the same cardinal scale. This would include both incomparable items, items that are on a par, and items that stand in trichotomous relations but in a weaker, e.g. ordinal, scale.

more, and we should not expect them to value them equally. Our expectation of the comparison should fall silent. Likewise, since we should expect the preferences of agents who regard two items as on a par to shift in response to small but not to large sweetenings, those expectations cannot be expressed numerically.

This suggests that, despite the formidable arguments in its favor, probabilism is too stringent a demand on our expectations of agents whose preferences are perfectly axiological, if they think axiology is non-trichotomous. But if we abandon probabilism, what might we replace it with?

The best qualitative probability model that countenances things like expectation gaps (which is what we need for an agent whose preferences have incomparabilities) and expectational parity (which is what we need for an agent whose preferences include parities) comes from Włodak Rabinowicz [2017]. Rabinowicz's models make use of a *representor*. A Representor for qualitative probability in this case is a set of permissible doxastic states, that collectively represent the agent's credal mental state. A permissible doxastic state is itself a set of probability functions. We then define their credences using an intersection model, according to the following where Cr is the credence function, S is a doxastic state, and p_i is a probability function in the representor:

STATE SUPERIORITY: $Cr(A) > Cr(B)$ in S iff for all $p_i \in S$, $p(A) > p(B)$

STATE EQUALITY: $Cr(A) = Cr(B)$ in S iff for all $p_i \in S$, $p(A) = p(B)$

STATE GAP: There is a credal gap between $Cr(A)$ and $Cr(B)$ in S iff neither $Cr(A) > Cr(B)$, $Cr(B) > Cr(A)$, nor $Cr(A) = Cr(B)$ in S . This will happen, e.g., if in some p_i $p(A) > p(B)$ while in others $p(B) > p(A)$.

These definitions hold for a single permissible state in the representor. We now give the definitions for the representor itself, which will include probabilistic parity.

REPRESENTOR SUPERIORITY: $Cr(A) > Cr(B)$ in R iff $Cr(A) > Cr(B)$ in all $S \in R$

REPRESENTOR EQUALITY: $Cr(A) = Cr(B)$ in R iff $Cr(A) = Cr(B)$ in all $S \in R$

REPRESENTOR PARITY: $Cr(A)$ and $Cr(B)$ are on a par in R iff $Cr(A) > Cr(B)$ for some $S \in R$ and $Cr(B) > Cr(A)$ for some $S \in R$

REPRESENTOR GAP: There is a credal gap between A and B in R iff there is a credal gap between A and B for all $S \in R$

This model allows us to form well-defined expectations about agents whose preferences mirror a non-trichotomous axiology. But its base remains the humble probability function. If there is no way to define normalizable probability functions, then the agent's preferences still defy expectations. Complicating the axiology and retreating from probabilism to accommodate the complications does not yield a new solution to the problem.

3 VIABLE RETREATS?

So far, we have seen that the prospects for normalizable divine expectations based on axiology are dim. But perhaps there is a viable backup? Perhaps we can replace talk of expectations (in the mathematical sense) with comparative confidences. This will cause some trouble in saying how strong a particular Bayesian argument concerning theism is, but it may still be enough to underwrite them. Most arguments rely not on precise numbers, but on claims about how much more this or that is to be expected given theism. Or perhaps we can guide or expectations not with axiology but with some aspect of divinity. Maybe love. Here, I will argue that neither retreat escapes our basic dilemma.

3.1 A RETREAT TO COMPARATIVE CONFIDENCE?

So probabilistic expectations, even using qualitative probability, are out. Nevertheless, might we still construct a rational comparative confidence function? The epistemology of comparative confidence has come a long way in recent years,³¹ so it is worth exploring what a comparative confidence relation that encodes an axiological expectation about world creation looks like.

Just like a probability function, a comparative confidence relation is defined over a σ -algebra. In our case, the natural sample space is the space of permissible objects of creation (including a null object to represent God choosing not to create). However, instead of a function to $[0, 1]$, we encode our expectations by defining a binary relation \succcurlyeq (with \succ and $=$ defined in the usual way). Roughly, for $X, Y \in \sigma$, $X \succcurlyeq Y$ means that the agent is more confident that God's creation will verify X than that God's creation will verify Y . Of particular concern to us will be the elements of σ that are true at exactly one world.³²

There are certain structural constraints that a binary relation must fulfill to be the right kind of thing to represent comparative confidence. First among these are NON-TRIVIALITY, TOTALITY, and TRANSITIVITY:

NON-TRIVIALITY: $\top \succcurlyeq \perp$ and $\neg(\perp \succcurlyeq \top)$

TOTALITY: $X \succcurlyeq Y$ or $Y \succcurlyeq X$

TRANSITIVITY: if $X \succcurlyeq Y$ and $Y \succcurlyeq Z$ then $X \succcurlyeq Z$

ENTAILMENT ALIGNMENT: If $X \vDash Y$, then $Y \succcurlyeq X$

In addition, we have our own bespoke requirement, which encodes what axiology tells us. Where X and Y describe complete objects of creation and \geq is the objective quality relation:

AXIOLOGICAL ALIGNMENT: $X \geq Y$ is proportionate to $X \succcurlyeq Y$

These are not, however, our only constraints. Just as there are accuracy-dominance arguments that establish probabilism as a structural coherence requirement for credence functions, there are accuracy-dominance arguments that establish additional coherence requirements for comparative confidence

³¹ For a representative sample, see Fishburn [1986], Icard [2016], Konek [2019], and Eva [2024].

³² I will use 'world' and 'object of creation' synonymously and bracket questions about whether the product of God's creative act is a world in the Kripkean sense.

relations. These requirements are strictly weaker than the axiomatic requirements for turning a comparative confidence relation into a qualitative probability relation, which shows that the option under consideration is a real retreat. In particular, a theorem of Fitelson & McCarthy [2014] shows that the following is required by weak accuracy dominance avoidance (if we assume propriety for the scoring rule):

ENTAILMENT-DISJUNCTION ALIGNMENT: if $X \models Y$ and $Y \& Z \equiv \perp$, then $Y \vee Z \succ X \vee Z$

This is significant, because adding ENTAILMENT-DISJUNCTION ALIGNMENT to our other structural constraints yields the following representation theorem (from Wong et al [1991]) for comparative confidence:

BEL-REPRESENTATION: if \succsim is a total preorder that obeys NON-TRIVIALITY, ENTAILMENT ALIGNMENT, and ENTAILMENT-DISJUNCTION ALIGNMENT, then \succsim is fully representable by a belief function.

This is significant for our case because belief functions must normalize.³³ This was the same requirement we ran into when dealing with probability functions. This shows that a retreat even to comparative confidence runs afoul of the coherence requirements generated by weak accuracy dominance avoidance. Because this is a requirement of rationality, I conclude that there is no new way to generate a viable expectation for divine creation that satisfies AXIOLOGICAL ALIGNMENT.

3.2 A RETREAT TO LOVE?

In Draper's [2025] argument from evil, expectations for what he calls "Core Theism" are not defined in terms of axiology, but in terms of love. He does not say very explicitly what kinds of expectations divine love of creatures create. But because of how structural the problem we identified with matching expectations to axiology turns out to be, we do not need detailed expectations generated by lovingness to see how the problem might recur. It is incumbent on the proponent of love-based expectations to outline how they might be constructed to avoid the issues raised in §2.

4 RELATION TO SKEPTICAL THEISM

It's a common response to Bayesian arguments to try and undermine the expectations that fuel the (un)favorable probabilities that the proponents of the argument advance in the name of their cause. Perhaps the best known instance of this approach in the debate over God has come to be known as *skeptical theism*.³⁴ Different thinkers develop it in different ways, but the core concept behind skeptical

³³ More technically: Belief functions are mass functions, and generally speaking mass functions must normalize. See Shafer [1976] for details.

³⁴ The literature on skeptical theism is vast, but the following are among the highlights: Wykstra [1984], Alston [1991], Draper [1996], Bergmann [2001], Almeida & Oppy [2003], Rowe [2006], Hendricks [2018], and Oleivera [2023a], [2023b].

theism is this: because of human cognitive limitations, the inference from what we know about evils and their consequences to atheism is not a good one.

Just from this, we see a two key differences with the thesis we have so far defended. First: our thesis is broader. It targets all Bayesian arguments that rely on divine expectations, not just arguments from evil. Second: our thesis is more modest. It does not say whether or not a particular kind of phenomenon or observation is or is not evidence for or against theism. It says that a particular framework for making these sorts of claims is not fit to purpose.

That being said, it has its similarities. Just like the skeptical theist, I am arguing that particular claims common in the literature about the correct expectations given theism are false. And so it is natural to wonder whether responses to skeptical theism are likewise responses to our argument.

The most important problem facing skeptical theism is a “Goldilocks objection.” The skeptical theist must inject enough skepticism into the debate to successfully undermine her target argument, while not injecting so much as to be unreasonable. As Draper [2025, ch. 8 p. 23] puts it:

For any given argument from evil, there is inevitably some level of skepticism about value or necessity or both that suffices to undermine that argument. The trick, of course, for the skeptical theist, is to show that the minimum level of skepticism necessary to undermine a particular argument from evil does not exceed the maximum level of skepticism that is reasonable

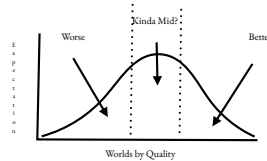
Here is where the key difference between our argument and skeptical theism comes to the fore. The skepticism about divine expectations that we have defended is not mediated by modal or axiological skepticism. It is baked into the framework through such things as the axiological requirement on the expectation function or the AXIOLOGICAL ALIGNMENT requirement on the comparative confidence relation *that we know everything there is to know* about axiology, and the modal base from which God is creating. In other words, whatever amount of modal or axiological skepticism one thinks is a reasonable level, *we used less than that to make the argument.*

Instead, our argument is a formal incompatibility argument. There is no way known to mathematics to have a credence function or comparative confidence relation that mirrors the most likely axiological situations (either no unsurpassable worlds or a large class of them) while maintaining coherence requirements demanded by weak accuracy dominance avoidance. I conclude that if there is a response to this argument, it will look very different from responses to skeptical theism.

5 CONCLUDING UNBAYESIAN POSTSCRIPT

Suppose the arguments above succeed. Where does this leave us? We have a handful of options, which I will lay out without firmly choosing amongst. First option: double down on the neo-Leibnizian position and embrace unsurpassable worlds. If we determine that there is such a thing, we can use Bayesian arguments to try and determine whether we inhabit them. Second option: find a new source of expectations about divine creation. But there are sharp limits on what those expectations must look like, if they do not generate unsurpassable worlds. In particular, they must be “anti-snobbish,” trailing

off infinitely in both the good and the bad directions. They will have at least one peak among “mid” worlds, with a shape vaguely resembling this:



We can then once again use Bayesian arguments to see if our world has the features these anti-snobish expectations predict a creation would have. I am unsure how to even begin that project, perhaps because I really don't where to source the anti-snobish expectations in the first place.

This brings us to the third option: abandon Bayesian arguments for more traditional natural theology/atheology. Bayesianism was brought into this debate because it promises clarity, precision, and a framework for weighing the impact of disparate pieces of evidence, as well as a way to compare the impact of intrinsic probability from that of evidential weight. If it is not the right tool to do that in this context, there are other options. There have been debates over theism for centuries before Bayes proved his theorem, and setting aside one framework does not tell us where the conversation should go next.³⁵

³⁵ Thanks to Dan Lindford for helpful comments on this paper at the Greatest Philosophy of Religion Conference of All Time, and to audiences at that conference as well as the Workshop on Fine Tuning at the University of Mississippi and the Rutgers Center for Philosophy of Religion Reading Group for helpful commentary and discussion.

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