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The intrinsic probability of theism

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Abstract

In this paper, I explore one of the most important but least discussed components of an evidentialist case for or against theism: its intrinsic plausibility and simplicity as a theory aside from the evidence. This is a crucial consideration in any inductive framework, whether Inference to the Best Explanation, probabilism, or another. In the context of Bayesian reasoning, this corresponds to an assessment of theism's intrinsic probability. I offer a survey of how philosophers of science have attempted to evaluate the intrinsic plausibility and simplicity of scientific theories more generally, before applying these considerations to the question of God's existence.

1 | INTRODUCTION

It is generally agreed that when we assess theories, we must look not only at how well they explain the data but also at theoretical virtues which are *intrinsic* to the theory itself. One of the primary reasons is that for any given data, there are many (perhaps infinite) theories which could explain it—this problem underlies both problems of induction and underdetermination in science.[1]

So it appears that any framework for theory choice—whether Inference to the Best Explanation (IBE), probabilistic reasoning, or other theories of induction—will require an assessment of a theory's merits independent of the data. This has often been referred to as a theory's *simplicity*, and for ease of discussion, we can consider all such intrinsic theoretical virtues to constitute our stipulative notion of simplicity.[2] Those working in a probabilistic framework have naturally thought that such intrinsic features of a theory determine its intrinsic probability: the simpler a theory, the higher its intrinsic probability. Those who think that the strength of our beliefs should be proportionate to the reasons in favor of them—and that our degreed beliefs should be consistent with probability theory[3]—are called Bayesians, after Bayes' theorem[4]:

$$P(T|E) = \frac{P(T)\times P(E|T)}{P(E)}.$$

There are variants on this formula—Bayes' theorem—which remove P(E)—often a confusing term—and replace it:

$$P(T|E) = \frac{P(T) \times P(E|T)}{P(T) \times P(E|T) + P(\neg T) \times P(E|\neg T)}.$$

Or, indeed:

$$\frac{P(T|E)}{P(\neg T|E)} = \frac{P(E|T)}{P(E|\neg T)} \times \frac{P(T)}{P(\neg T)}.$$

These theorems are helpful since we can let T represent a theory—in this case theism, the view that there exists an omnipotent, omniscient, and perfectly good person—and E our evidence, asking: What is the probability of theism given our evidence?[5] And we can see that is a function of three parts:

1. P(T)—the "intrinsic probability" of theism: the probability of theism before taking into account any evidence.[6]
2. P(E|T)—the probability that the evidence would be observed given theism (i.e., theism's predictive value).
3. P(E)—the probability that the evidence would be observed in general. As the elaborated forms of Bayes' theorem show, this itself can be broken down so that it is essentially an average of the probability of E given all the different theories (P(E|T), P(E|¬T), etc.), weighted by the intrinsic probabilities of those theories.

Since the relation of the theory to the evidence can be modelled by some relation between P(E|T) and P(E),[7] we can here see the Bayesian analogue of the problem: How do we determine P(T)? This is known as the "problem of the priors." But closer reflection shows that the problem is more general: Even an assessment of P(E) (and so any measure of the strength of the evidence—Bayesian or not) requires a judgment concerning the intrinsic probabilities or intrinsic plausibility of alternative hypotheses: P(¬T), for example.[8] While this problem has sometimes been taken to undermine Bayesian approaches, recall that such problems plague any substantive inferential system: IBE equally requires judgments regarding the intrinsic plausibility of a theory (and rival theories) for example.[9] The problems of curve fitting/underdetermination and induction have shown us quite decisively that, given any number of competing empirically equivalent theories, there must be some theoretical work underpinning the prioritization of one theory over the others. So for those still averse to probabilistic reasoning, this paper will still have use as a survey of theism's intrinsic plausibility relative to alternative theories.

Let us begin with some cause for optimism regarding intrinsic plausibility and intrinsic probabilities. Most of us are confident attaching rough *posterior* probabilities to all sorts of qualitative propositions, including God's existence. But it is difficult to see why a posterior probability should be any more scrutable: If the probability assignment is consistent with the laws of probability, then a posterior probability already commits us to certain constraints on our intrinsic probabilities (namely, that they must take a certain value depending on the strength of the evidence). And it is difficult to see in principle why we might object only to fixing P(T) and not P(T|E) directly. Analogously, most of us are confident assigning some degree of intrinsic plausibility to theories—and indeed, this is necessary if we are to judge the strength of a piece of evidence for a theory, since P(E) is a function of various $P(T_i)$. We often appeal, moreover, to ordinal judgments of plausibility: Hence, thinking that "all emeralds are green" is *more* intrinsically plausible than "all emeralds are grue."

More pressingly, we note that even in seemingly more objective statistical contexts, assumptions of intrinsic probability are in fact necessary: We rarely use statistical probabilities even when we think we are doing so! To see this, consider observing five cars in a row, all of which are red. We might say that picking one of these at random yields a probability of 1 of picking a red car. But what about the *next* car we observe? The probability of *that* car being red is surely not 1—that is no cause for certainty at all! But most of our statistical inferences are in fact more like this. Inductive inference is usually expansive: We reason from a smaller sample to generalize about what we have not yet observed. And this, as in the example of the car, requires some theoretical or "prior" idea of how likely it is that the next car should be red. Using statistical probability here simply delivers the wrong answer.

These considerations motivate the idea that we can, in fact, make judgments of intrinsic plausibility, which in some cases can at least be roughly weighed or measured. Given the merits of probabilistic reasoning more generally and given that any problem of subjectivity here is a general problem not unique to probabilism, we have some cause for optimism regarding rough appraisals of intrinsic probability as well.

Noting that this is a general problem for inductive frameworks gives us a hint of where to start this appraisal. Scientists and those who use abductive reasoning often give priority to explanations which are simpler, more elegant, less *ad hoc*, and which eschew unnecessary assumptions, for example. The underlying theme to all, or most, is the idea of *simplicity* or *parsimony*. So let us use "simplicity" as an umbrella term for all those determinants of intrinsic probabilities—noting in advance that the determinants are heavily disputed.

There is another consideration particularly well suited for probabilistic reasoning, however: the idea of symmetry. Thus, we might say that insofar as multiple theories are relevantly symmetrical (i.e., equally simple), we afford them equal probability. This thought gives rise to the *principle of indifference*: Where there is no reason to prefer one theory over another, we should give them equal probability. So we see that this suggestion complements the preference for simplicity: It offers a way of proceeding once we have made some ordinal judgments of simplicity. It is not an alternative criterion to simplicity and perhaps answers a slightly different question (i.e., how to get from ordinal or rough judgments of simplicity to more specific probabilities).

This latter method is, of course, how many probabilities are worked out, or assumed. So rolling six on a normal six-sided die has a probability of 1/6, and we know this even before performing a series of trials to generate statistical data. There are two immediate problems here. The first is that it is sometimes difficult to generate any relevant symmetry: To what hypotheses is theism relevantly symmetrical? It does not appear to be symmetrical with atheism since atheism appears more parsimonious, positing fewer entities and fewer kinds of entities.[10] So we might suppose that, in the context of purely intrinsic probabilities (i.e., with no evidence considered), atheism is more probable than theism. But how much more probable? Is the probability of theism 0.49, 0.1, or even lower? Even if we can come up with a hypothesis symmetrical with (and so equally probable as) theism,[11] the two hypotheses will not be exhaustive and so—since we can no longer assume that their probabilities add up to 1 (in which case each would have a probability of 0.5)—we cannot clearly determine their individual probabilities.

The second problem is that even in simple cases with apparent symmetries, it is not clear how to apply the principle of indifference—this is due to a problem known as Bertrand's paradox. The most famous example is the cube paradox: Suppose a factory makes cubes of random sizes, of side length between 1 and 2 cm. What is the probability that a given cube will have a side length under 1.5 cm? That depends on how you measure the cube and apply the principle. If you choose length, it is 0.5. But if you measure by area, the probability is 0.25, or by volume, 0.125. So the case yields different answers depending on your metric—even in simple cases!

So principles of indifference are not always readily applicable, although I will note later how we might yet use them. For now, let us turn back to the constituents and evaluation of the simplicity of hypotheses. In the case of theism, we appear to have a double difficulty: that of defining simplicity and that of translating this into an intrinsic probability even if we do have a coarse qualitative or comparative assessment of theism's simplicity. Let us explore how philosophers have tried to make these issues more tractable.

2 | SIMPLICITY

The controversy over simplicity's constituents goes some way towards explaining the disagreement over theism's simplicity and indeed the extreme paucity of such discussion in the philosophy of religion. Very few writers have translated work from philosophy of science and formal epistemology to the philosophy of religion. So let us begin with the philosophy of science.

2.1 | Scope

The clearest and least controversial constituent of simplicity is what Swinburne calls (negatively) "scope"[12] and Draper (positively) "modesty."[13] This essentially says that the more specific claims a theory makes, the greater the chance that something it says is wrong. This is trivially demonstrable probabilistically: Necessarily, $P(X\&Y) \leq P(X)$ for any X and Y. Hence, the theoretical viciousness of ad hocness: Ad hoc theories are just ones which add assumptions and so diminish the probability of the overall conjunctive hypothesis. Hence, when judging the simplicity of certain mathematical models, philosophers of science have sought to minimize the number of "free parameters": This is just to say that theories should not have to artificially "specify" parameter values, where these are not derivable from other content within the hypothesis.

One clear consequence of this is that more specific or elaborate theories including the *claim* of theism—for example, commitment to a certain number of gods, commitment to further attributes of God(s), or commitment to particular religious claims—will have a correspondingly lower intrinsic probability. And here, we reach the other, oft-neglected "problem of priors": understanding how likely certain further hypotheses or predictions are given an initial theory. Given that a god as defined above exists, what is the probability that there is an afterlife? What is the probability that God has or will become incarnate? These are not obviously *entailed* by theism. So the probabilities P (theism & afterlife) and P (theism & incarnation) will be lower than P (theism). Specifically, P (theism & adjunct) = P (theism) × P (adjunct|theism). But P (adjunct|theism) is not trivially scrutable in most cases. If theism entailed an afterlife or made it very probable, then P (adjunct|theism) may be 1 or not much less. But perhaps there is no reason to expect an afterlife given theism—then it might be very low and reduce the probability of the overall theory considerably. But while there are few explicit attempts to appraise these probabilities,[14] the central arguments of natural theology all depend—at least in Bayesian forms—on making *some* claim about the likelihood of certain phenomena (e.g., evil, fine tuning, hiddenness, and the ministry of Jesus) given theism, relative to given atheism (e.g., that evil is improbable given theism but not so improbable given atheism). So there is reason to think we are not entirely in the dark.

To assess a more elaborate theory including theism as a claim, for example, "mere" Christianity, we need to identify the essential theoretical claims of Christianity (e.g., the incarnation, atonement, and resurrection) and have some idea of how likely it is that God would, for example, become incarnate, even before looking at the evidence. Here, arguments for the "fittingness" or even the necessity of the incarnation attempt to do work to raise this probability and hence raise the probability of Christianity even without recourse to the evidence.[15] Of course, any particularly elaborate version of theism will have an intrinsic probability less than 0.5 and probably significantly less. On the other hand, there is no reason to suppose the evidence might not in principle outweigh this improbability. And, indeed, it need not be the case that the conjunction of all one's detailed religious beliefs is probable. Rationality only requires that they are individually probable and—where a religion is committed to "essential claims"—that the conjunction of those *essential* claims is probable. The fundamental point here is that to the extent theism adds claims which it does not predict (either by entailment or with a strong probability), the intrinsic probability of the overall theory is diminished.

2.2 | Parsimony

Simplicity is otherwise more controversial. In the philosophy of science, it can be categorized into two primary kinds: parsimony and elegance (Baker, 2016). Parsimony is the idea that scientific theories should minimize the number of things posited, whether entities, properties, or kinds. Elegance is somewhat more difficult to characterize but is often associated with syntactic concision: The more concisely one can state a theory, the simpler it is. One can immediately see how these different emphases might apply differently in different contexts, since hypotheses are of many different kinds. While some hypotheses—Newton's laws, for example—posit relations between variables and so can clearly be characterized quantitatively and via formulae (e.g., the curve-fitting problem), other hypotheses —"humans and apes share a common ancestor," "God exists", or "Jesus was raised from the dead"—evidently will have a different kind of simplicity from the simplicity of a mathematical formula, if they are to be considered simple at all. So it may be that the kind of simplicity required for a good theory is context relative. But it is nevertheless plausible that we can come up with a theory of simplicity which captures most of the important considerations for all contexts, despite differing contexts requiring different emphases within that set.[16]

Take parsimony first. It seems clear that scientists tend to try and minimize their ontology of *kind*, at the very least: They take what seem to be many different sorts of things in the universe: the thousands of species, human artefacts, natural phenomena, and so on—and posit that they are really just aggregations of a few fundamental types of entity or force: leptons, gluons, quarks, electromagnetism, gravity, and so on. This also explains why we do not just accept the existence of certain things without good evidence: We think it is more likely than not that there are no unicorns, before considering the evidence.[17] The existence of another instance of things already known to exist, however, is less problematic: Scientists are happy to posit billions of atoms never to be detected or observed or interacted with by humans. Properties are treated in roughly the same way: Scientists try to reduce many properties—being red, being magnetic, being in love, and so on—to just a few: the properties of the fundamental entities and the forces acting on them.[18]

These principles are generally thought to represent qualitative parsimony. But some philosophers (e.g., Huemer, 2009a; Nolan, 1997) maintain also that *quantitative* parsimony is important: Even without positing new kinds, scientists should aim to posit as few *entities* as possible, *ceteris paribus*. This remains controversial, however, and it is widely accepted that even if quantitative parsimony is a theoretical virtue, it is at least less weighty than qualitative parsimony.

2.3 | Elegance

Let us turn to *elegance*. Here, the debate is considerably more complex, in part because theories vary so much in kind, and say such different sorts of things. Which theory is more elegant: that f = ma or that Jack the Ripper was responsible for all the murders around Whitechapel? Surely these are not commensurable simply by examining the English sentence length—and plausibly their elegance is not really commensurable on *any* grounds!

This hints at a further complexity: The concision with which a theory can be stated is evidently language dependent: What can be stated concisely in one language might be very difficult—or even impossible!—to state in another language. In any case, languages can be artificially changed to modify the simplicity of hypotheses, by use of abbreviations or gerrymandering new terms: thus the famous example of "grue," which evidently does not have the same conceptual simplicity as "green" but which can form more concise hypotheses.

Various responses have been made here. But what seems clear is that we need a measure of simplicity which is either language invariant, or which can be applied to a particularly "natural" language (given the attendant assumption that natural languages capture simplicity better), or which can somehow be applied directly to concepts without recourse to language at all. This is no trivial task!

It is perhaps for this reason, however, that there has been slightly more progress on theories expressible in mathematical terms than others. So, for example, many characterizations of simplicity have centred on the curve-fitting problem, where theories can mostly be expressed simply by numbers and basic mathematical operators. Thus, criteria have been proposed for adjudicating between curves: Those with simpler mathematical operators (e.g., lacking indices) and simpler numbers (preferably integers and perhaps also smaller numbers) should be prioritized. And, as we have noted, theories should minimize the number of free parameters. Given the "naturalness" of mathematics, some have even given precise metrics for judging the overall simplicity and explanatory power of curves: the Akaike information criterion and the Bayesian information criterion being two of the foremost examples (Sober, 2000).

Qualitative hypotheses are evidently much more difficult to assess in this way. We simply have less certainty that our "natural" languages capture simplicity as well as does the language of mathematics. For this reason, some have attempted to turn not to mathematics but to other artificial languages to try and evaluate the simplicity of theories.

Thus, the concision of a hypothesis within certain computer languages might be taken to indicate simplicity—and hence we have metrics like minimum message length (Wallace, 2005) and Kolmogorov complexity (Solomonoff, 1964a, 1964b), which purport to help us adjudicate. Though such proposals have been met in some quarters with veritable enthusiasm, it is difficult to see how one might objectively translate "God exists" into these languages.

Others have attempted to focus on the concepts employed themselves, trying to describe how some predicates are simply more complex than others. Indeed, this is necessary if we are to suppose that Goodman's new riddle of induction is soluble: We need a reason to suppose that "green" is a more "natural" kind for induction than "grue." I do not suppose that the naturalness of predicates has been anywhere near decisively worked out, but one of the more plausible suggestions is that of Swinburne (1973, 2001, 2004), who suggests that a predicate is simpler if it is more readily observable: To know whether an object is green, we need merely observe its color, whereas to know whether it is grue, we need to observe its color and the time.[19]

The final aspect of elegance concerns the network as a whole. Supposing we have already identified an ontology, a simpler theory will then posit fewer and simpler relations between the variables and entities. Perhaps this is where, for example, our discussion of the simpler case of simplicity is salient: the case of curve fitting and establishing relationships between variables. If so, this facet of simplicity may be one of the more tractable.

3 | THE INTRINSIC PROBABILITY OF THEISM

No one can escape the problem of ordering empirically equivalent theories according to intrinsic theoretical criteria. But given the considerable motivation for probabilistic reasoning in general, we can translate this problem to discussion of intrinsic probabilities and the various aspects of simplicity impacting them. Having discussed a few of the foremost attempts to generate more objective intrinsic probabilities in general, we turn to theism in particular.

Given limited space, I aim merely to illustrate the relevant points of contention, rather than providing a full appraisal of theism's simplicity. I will first discuss some aspects of simplicity as applied to theism and then conclude with a discussion of how to use such judgments in an overall assessment of P(T). Since Swinburne (2004, based on 2001) has provided by far the most complete account of the simplicity of theism, we begin with him and divert where necessary to other authors.

3.1 | Parsimony

Firstly, Swinburne suggests theism posits only one entity and so is the simplest possible theory in this respect, short of positing no entities at all.[20]

This appears simple and uncontroversial enough, but it introduces a complexity which applies over various criteria but especially here. For although God is only one entity, one might think that since God's existence makes it likely that other things would exist, it is thereby complex. As Dougherty and Gage (2015) note, however, we should measure for simplicity not the *consequences* of a theory but the *fundamental* or *brute* entities or properties it posits: Logical systems often generate infinite theorems, but that is no reason to think they are complex. Likewise, we might add scientific examples: Newton's laws generate (in conjunction with some beginning state of various entities) a huge number of complex consequences, but are nevertheless manifestly simple. And a similar point can be made in advance of our discussion of kinds of entity: In explanation, scientists tend to try to reduce the number of kinds of entity at the root of the universe: gluons, quarks, and so on. The fact that they actually admit all sorts of entity deriving from these by aggregation or causation—the thousands of animal species, among others—in their ontology is not a problem. What is important is limiting the number of original or fundamental entities or kinds.[21]

A further challenge here is implied by Dawkins (2006), who suggests that a mind as powerful as God's must be extraordinarily complex. A few summary comments must suffice: Firstly, Dawkins' assertion that God is complex is based partly on the natural theologian's suggestion that design in nature (e.g., the human brain) is complex and so requiring explanation. But part of this complexity is surely the physical complexity of the brain—and it is far from clear that theism is comparably complex, given the lack of physical complexity. Secondly, God's being complex is not the same as theism being a complex theory. Thirdly, as Swinburne (2004) and Miller (2016) have argued, infinite degrees of properties can, on occasion, be simpler than large, finite degrees of properties. Dougherty and Gage (2015) offer further responses. Nevertheless, it is possible that the uniformity of God's mind and the various "parts" or constituents of a mind require at least some inflation in the number of kinds and, possibly, a large number of parts. Part of the solution to this issue will depend on the primitivity of "person" as a brute kind.

Does theism posit a new kind of entity, however?[22] For some, God is the most "other" thing imaginable—surely the most novel thing we could posit in our ontology! But for others (e.g., Dougherty & Gage, 2015; Swinburne, 2004), God is relevantly like us: a person, whose pattern of explanation we use ubiquitously. If so (and in keeping with Christian tradition vis-à-vis the *Imago Dei*), then God is not a fundamentally "new" kind.

But perhaps it is not important whether we are familiar with this kind elsewhere. For in the absence of any background evidence whatsoever (when looking at purely intrinsic probabilities), any kind of entity is a "new" entity. There will only be a problem of an inflated ontology if either (a) multiple kinds of entity are posited as brute or (b) new observed entities are not expected as a *consequence* of the theory. But theism posits only one kind of brute entity (a person), and the only other observed kinds of entity are not especially improbable given theism (as argued in Swinburne, 2004). A similar response obtains for those inclined to think that disembodied minds (e.g., God) are a novel kind of entity.

Swinburne suggests that minimizing the number of properties and kinds of property is also a part of parsimony. There is a question here of how to separate kinds of property from kinds of entity: Some kinds of entity, surely, are defined by their properties, so there may be some conflict regarding, in this case, whether to count a person as one primitive kind of entity with merely derivative/consequential properties or whether to count the constituents of persons (e.g., beliefs, abilities, and moral quality) as primitive kinds of property (or entity), thereby perhaps multiplying the brute ontology. Perhaps there is no rationally compelling argument either way.

It will be helpful at this point to link the discussion to our earlier mention of free parameters and scope. We said earlier that insofar as a theory sets specific parameter values (or makes more specific claims in general), it is thereby a theory of greater scope. But theism stipulates that God has not just power, knowledge, and goodness but maximal or infinite degrees of these. These appear to be very specific claims, given how many possible degrees of these properties there are—and seemingly the omni-properties constitute a tiny proportion of the possible permutations of possible properties (Wynn, 1993).[23] Is this a problem? Miller (2016) argues that it is not—that maximal degrees of properties are relevantly analogous to other scientific concepts (e.g., universal laws) such that both are, in fact, very simple, in virtue of their exceptionlessness and uniformity. Likewise, Draper (2016) has recently argued that theism satisfies his criterion of "coherence"[24] and uniformity insofar as it posits omni-properties. If that is so, theism seems to have minimal theoretical cost with respect to mathematical simplicity, and its immodesty at this point is drastically less than some have supposed.

Some have sought to argue that some of God's properties are derivable from others: Swinburne (2004, 2009), for instance, has suggested that all God's omni-attributes are entailed (or near enough) by his being omnipotent—the theory then only having one free parameter—that of maximal power—and thus being relatively modest.[25] Likewise, proponents of perfect being theology may suggest that God's omni-attributes are all entailed by his having one brute property: perfection. And, finally, the doctrine of divine simplicity (distinct from the simplicity of theism as a hypothesis), in holding that God has only one property, could render theism extremely simple. The difficulty (aside from the standard worries) with this latter suggestion, however, is that such a property would about as far from readily observable as a property could be. But *if* God's properties can be derived theoretically from one initial simple property, then theism may be particularly simple in this respect, positing only one brute property.

3.2 | Elegance

As noted previously, it is difficult to determine the theoretical elegance of qualitative hypotheses. Much could be said, but here I can only point in the direction debates might take.

Given the complexity of debates over syntactic concision, it is difficult to offer much more than a couple of comments. Firstly, some have suggested that theism is extremely syntactically concise in a relatively natural language: "the greatest possible being," for example. Depending on how natural "great" is as a kind, this suggestion may succeed. Even when broken into further constituents, the properties theists posit do appear to be relatively simple and, in particular, readily observable: Knowledge, power, and goodness all seem to be familiar, natural kinds.

As suggested earlier, the interrelations between entities and properties are important for theoretical elegance. It is difficult to know how to assess theism in this respect. While the uniformity of God's mind (e.g., that God always thinks and acts rationally) may require some explanation (or, more accurately, engender some improbability as a brute fact),[26] the rest appears relatively simple: God acts on one principle alone: the good, as determined by his comprehensive knowledge of good and evil. So long as there is an absence of complex interrelations between God's properties (or parts), theism satisfies this criterion.

3.3 | Symmetries and methods

We conclude with a brief discussion of how to get from a coarse judgment of simplicity to concrete probabilities to be used in an evidential case for or against theism.

An initial approach, which seeks to circumvent the problem of intrinsic probabilities, is to note the phenomenon of convergent evidence: The idea that once sufficient evidence is collected, intrinsic probabilities are of less importance because the difference in explanatory power between the hypotheses grows so large. Essentially, the evidence makes the answer clear when enough is collected. The clearest instance of this argument in the philosophy of religion is perhaps McGrew and McGrew's (2009) argument for the resurrection of Jesus, which the McGrews argue is evidence both for their specific augmented version of theism (Christianity) as well as for bare theism. The suggestion here is that the evidence is so overwhelming that only an obscenely low intrinsic probability (or similarly strong evidence against theism) could render theism improbable. Though not so explicit, evidential arguments from evil should perhaps also be understood in this way.

A similar approach is to suggest that the evidence is not quite directly decisive but close enough: Any theories with similar explanatory power end up being so ad hoc (i.e., by adding auxiliary assumptions) that the intrinsic probability is reduced to far below that of the hypothesis in question (whether theism or atheism). So, for example, a theist might allege that once an atheist accounts for the fine tuning of the universe via a multiverse and for the evidence for the resurrection by mass hallucinations, and so on, the only atheistic hypothesis even left in the game is one which has been complexified far beyond the bare theistic hypothesis. Swinburne (2004) represents such a move.

I noted earlier that it is often easier to get a grasp on the intrinsic probabilities (e.g., P(T)) than on the actual probability of fundamental interest, P(T|E). Perhaps this is not always the case. In some cases, one of the more scrutable probabilities might be $P(T|E_{1 \ldots i})$, where $E_{1 \ldots i}$ represents *some* of our evidence set (e.g., perhaps just the fact that anything exists at all). This might eliminate some spurious hypotheses now known (with near certainty) not to be true and can perhaps generate a helpful symmetry. Such a suggestion is again offered by Draper (2017). Draper suggests that the existence of physical states and mental states (very generally) could be explained, ultimately, by a mental source (source idealism) or by a physical source (source physicalism). He supposes that there is broadly a symmetry of parsimony, elegance, causal structure, and so on, between these theories, and so, the probability of each might be *at most* 0.5 (since they are mutually exclusive but not exhaustive). But, says Draper, theism is a very immodest (i.e., specific) form of source idealism, in virtue of its positing only one creator, positing a specifically *personal* creator, and positing his omni-properties.[27] So the intrinsic probability of theism is in fact very much lower than 0.5 and decreases with every specific feature of the theistic hypothesis.

Finally, one might suppose that *comparative* claims between the main theories would suffice. One can compare, for example, two rival theories; thus:

$$\frac{P(T_1|E)}{P(T_2|E)} = \frac{P(E|T_1)}{P(E|T_2)} \times \frac{P(T_1)}{P(T_2)}.$$

In this case, we need not worry about covering *all possible hypotheses* in our assessments of the relevant probabilities. But the obvious downside to this is that knowing, for example, that $P(T_1|E) > P(T_2|E)$ does not tell us that $P(T_1|E) > 0.5$. That is, knowing that a theory is more probable than the individual main rivals does not guarantee that it is probable overall. Insofar as we want to know if a theory is probably true, the comparative approach will not necessarily help.

The comparative approach can be used to set bounds, however. Hence, Draper (2017) sets an upper bound on the probability of theism by noting that it is roughly symmetrical in terms of simplicity with aesthetic deism—the view almost identical to theism but suggesting that aesthetic value, rather than moral value, is what motivates God (so their intrinsic probabilities are equal). Draper suggests that since this view explains evil slightly better than does theism, and since the two are mutually exclusive,[28] the probability of theism is less than that of aesthetic deism, and so less than 0.5.

4 | CONCLUSION

In this article, I have sought to demonstrate some of the ways philosophers of science and religion have attempted to adjudicate the intrinsic probabilities of hypotheses more generally and particularly the intrinsic probability of theism. This is an important project given the fruitfulness of probabilistic reasoning in general and given that the determinants of intrinsic probability are required for theory choice *regardless* of whether one uses probabilistic method or not. Though I have not shied away from my conviction that theism is, indeed, a simple hypothesis, I hope to at least have demonstrated the salient points of attack for atheist critics.

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ENDNOTES

1 See Miller (2016) for an argument that these problems generate an epistemic requirement to prioritize and appraise theories according to intrinsic virtues.

2 Some authors consider the criterion of “scope” as separate from simplicity. Nothing substantive turns on this; however: I have stipulated my sense of “simplicity” and will consider all the commonly suggested determinants of intrinsic probability or intrinsic plausibility regardless.

3 This highlights the sense of “probability” I am using. It is distinct from statistical or physical probability and is often referred to as evidential, inductive, or epistemic probability. See Eagle (2011) and Swinburne (1973, 2001). On this account, objections regarding small sample sizes and lack of statistical data are irrelevant.A further distinction exists between objective and subjective Bayesianism. I take this to be a spectrum, where objective Bayesians think there are more rational constraints on probabilities other than mere consistency. This paper is technically neutral on this question, although most who try to determine intrinsic probabilities implicitly assume that doing so to some extent is a rational obligation, thus putting them on the objective end of the spectrum.

4 A justification of Bayesianism (or probabilism, which I take to be synonymous) is beyond the scope of this article. I can only point to the foremost lines of justification: theoretical justifications relating to probabilistic constraints on rational belief (see Hájek, 2008, for a survey of such arguments); the success of statistical—and especially Bayesian—reasoning in science itself (McGrayne, 2011); the probabilistic illumination and solution of many problems in epistemology and the philosophy of science (Howson & Urbach, 2006); and our frequent use of informal probabilistic claims in everyday

qualitative contexts (e.g., "God probably doesn't exist"). I set aside the question of what these probabilities represent. See Howson and Urbach (2006) for a fuller defense and Miller (2018) for an extension to historical reasoning.

[5] For the purposes of this article, I include "background knowledge" in the evidence and so do not discuss it in detail. This is because I am looking at features internal to the theory in question and because it is difficult to make any principled distinction between background knowledge and the rest of the evidence. But note that some commentators include "fit with background knowledge" as a component of *prior* probability, in part due to the ambiguity of "prior probability" (see footnote 6). Either way, such background knowledge will be included in the final calculation and may augment or diminish the final probability of theism. I take it that there are two theoretically virtuous ways a proposition might fit thus: It may form a particular elegance with the background entities/postulates and involve broadly the same ontology, or it may be a causal consequence. Critics might allege that theism fits poorly with background knowledge by, for example, positing very different substances from those known in the world. But this undermines theism only if those different substances are not plausibly causally derived (either probabilistically or by entailment: see Section 2.1) from theism.

[6] This is normally termed a "prior probability," but "prior" is relative and so misleading: A posterior probability in one iteration of Bayes' theorem becomes the prior probability for the next piece of evidence to be added. Hence, we might more clearly term the bare P(T)—prior to *any* evidence—the "intrinsic" probability of T.

[7] Which measure, exactly, is disputed. See Eells and Fitelson (2011).

[8] Huemer (2009a).

[9] Indeed, the arguments for the compatibility of Bayesianism and IBE (e.g., Climenhaga, 2017; Huemer, 2009b) suggest that any problem affecting Bayesianism is likely affect IBE similarly or more so. I do not have space to defend this at length here.

[10] Of course, once we conditionalize on certain evidence—for example, the existence of persons—it might be argued that theism no longer posits a new kind of thing and so loses its disadvantage in this respect, at least.

[11] As suggested by Draper (2017).

[12] To be distinguished from (a) *explanatory* scope, which is a theoretical *virtue*, since this refers to the wide variety of confirmatory evidence for the theory, and (b) Popper's notion of scope, where scope is again a virtue as it indicates falsifiability. A discussion of Popper's principle is beyond the scope of this paper, but there is a strong argument that the virtue of falsifiability is derivative of the virtue of not being ad hoc: Paradigmatic bad unfalsifiable theories tend to be very ad hoc and so theoretically vicious.

[13] Likewise, Dawes' (2009) account of simplicity amounts to the same thing.

[14] Though see Swinburne (2004) and Burling (2018) for some attempts. Braunsteiner-Berger (2014) offers some scepticism, as does the approach of "sceptical theism."

[15] As attempted by Swinburne (2003), who holds that an incarnation is at least as likely as not given theism and the existence of embodied agents who suffer evil and sin.

[16] I leave aside conceptions of simplicity which focus on the explanatory simplicity/elegance of a theory, which I suggest can be captured simply by the explanatory power—that is, the relevant metric comparing $P(E|T)$ and $P(E|\neg T)$, that is, the evidential strength of E for T. Such a conception can be found in, for example, Sober (2009). I note only that a theory explaining evidence in a particularly elegant way is likely just to say that theory is not too intrinsically improbable and yet unifies a wide range of improbable evidence—which is just to say that the explanatory power is high. So this conception of simplicity is still represented in my framework.

[17] Likewise, we do not believe in flying teapots or the Flying Spaghetti Monster—here we can see that the "burden of proof" regarding these and regarding theism can be reduced simply to a question of their intrinsic probabilities.

[18] Baker (2016) notes that scientists have, on occasion, invoked principles of plenitude—the exact opposite of parsimony. The plausible examples of this, however, still use parsimony with respect to brute or fundamental entities, positing further entities only insofar as they are expected as a result of (either causally or,e.g., forming a particular elegance with) already posited entities and kinds.

[19] See Draper (2016) for an attempt to solve the riddle under the criterion of "coherence."

[20] For this reason, he suggests, it is much more intrinsically probable than polytheism. Since positing no entities yields no explanatory power, and so any genuine rival theory posits at least one entity, there is little comparative cost here.

[21] It is on these grounds that Swinburne (2004) argues that the Trinity is nevertheless a simple entity, since, on his view, the latter two persons derive from the first. Also see Climenhaga (2018) for a reason based on the structure of induction to think that more fundamental states should be considered when applying these criteria.

[22] See Dawes (2009) and Oppy (2013) for a defense of this position.

[23] Lataster and Philipse (2017) offer a similar argument against monotheism based on the comparatively large number of possible polytheistic hypotheses. Saward's (2017) response is decisive, though the considerations of Miller (2016) and

parsimony considerations also apply here too. Miller (2016) offers a survey of all the other literature on the simplicity of omni-properties.

[24] Draper (2016) supposes that all Swinburne's theoretical virtues can be reduced to two: modesty and coherence.

[25] Gwiazda (2009) objects.

[26] Though see Miller (2016) and Draper (2016) for reasons to think this is not a significant cost.

[27] This is made clearer in Draper and Dougherty (2013).

[28] Draper does not explicitly make this assumption, but it is necessary for the argument's validity. It is, indeed, questionable.

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