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Probability of Naturalism and Metanormative Realism

Curtis Howd
University of Missouri-St. Louis, curtishowd@gmail.com

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Curtis Howd

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Advisory Committee

Gualtiero Piccinini, Ph.D.
Chairperson

Billy Dunaway, Ph.D.

Eric Wiland, Ph.D.

Abstract

Darwin's Theory of Evolution can be mobilized to provide epistemological challenges to metanormative realism. It is argued that, since natural selection selects for behaviors adequate for survival and fecundity, our psychologies must be shaped by this same process. A-type challenges point to the improbability of the vast number of true normative beliefs given that they evolved to track survival and fecundity, not truth. B-type debunking arguments point to the improbability of the hypothesis that evolution would track truth given that there are a multitude of defeaters for this hypothesis. I will argue that both a-type and b-type arguments fail to validly calculate the improbability of evolution's production of true normative beliefs. The former makes an error in assuming the independence of each belief while the latter does not consider the negation of the debunking hypothesis—the probability of human behavior adequate for survival and fecundity given false belief inputs.

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University of Missouri, Saint Louis

1   Introduction

From the assessment of scientific explanations, to the disapproval of killing without cause, to the commendation of great symphonies and beautiful trees, our veridical judgments have suspect origins. The plausibility of this intrusive thought emerges from our awareness that we are human, and as human we are animal, and as animal our brains have developed under the pressure of the very same mechanisms that developed the brains of the ape and the iguana and the condor. Accordingly, we believe our resulting psychological states are shaped by the mechanisms of one of our most successful scientific theories—Darwin's Theory of Evolution. Further, these mechanisms, which eventually result in organisms geared toward survival and fecundity, proceed without regard to producing accurate veridical judgments, were there such a thing.

The argument above can be mobilized to provide an epistemological challenge to many metanormative realisms. First, consider scientific realism: 1) scientific realists hold that our best scientific theories are somewhat true, 2) Darwin's Theory of Evolution is one of our best scientific theories, 3) Darwin's Theory of Evolution gives an account of the evolution of human judgments as developed under the pressures associated with

survival and fecundity, not truth, and 4) the very same judgments that Darwin's Theory of Evolution does not predict to track truth are those employed when judging the veridicality of Darwin's Theory of Evolution in the theory selection process. Thus, if we believe Darwin's Theory of Evolution is somewhat true, we admit that our psychological faculties used to judge whether or not Darwin's Theory of Evolution is somewhat true are nonveridical, leaving us with a sort of inconsistency in our beliefs.[1] For, how can we in one breath affirm the veridicality of our evaluative theory selection and deny its veridicality?[2] Call this argument form the "debunking argument."

Specifically, for the purposes of this project, the beliefs attended to are both normative and non-inferential. Non-inferential beliefs most commonly result from observation or perhaps some innate sensibility, intuition, or sentiment. I will focus on these for two reasons: it is plausible that evolution helped shape (specifically) non-inferential beliefs through adaptation, and most all of our inferential beliefs have likely, at some point, been grounded by non-inferential beliefs as premises obtained from observation and intuition. In the case of scientific beliefs, observation plays a crucial role in forming non-inferential beliefs. In the case of ethical judgments, sentiment plays a crucial role in forming non-inferential beliefs (think negative attitudes toward certain behaviors like killing others).

With a bit of effort, the debunking argument can be modified to provide epistemological challenges to other normative fields as well—e.g. metaethical realism: 1) metaethical realists hold that (at least one of) our best metaethical theories is somewhat true, 2) Darwin's Theory of Evolution is at least somewhat true, 3) Darwin's Theory of

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[1] Later in the paper, this "sort of inconsistency" will eventually be seen to amount to a low probability.
[2] Alvin Plantinga may have been the first to point out this problem.

Evolution gives an account of the evolution of human judgments as developed under the pressures associated with survival and fecundity, not truth, and 4) the very same judgments that Darwin's Theory of Evolution does not predict to track truths are those employed when judging the veridicality of ethical theories in our theory selection process.[34] While this argument does not result in a direct (sort of) inconsistency, it does pit scientific realism against metaethical realism. Further, those who endorse this kind of argument urge us to accept scientific realism as our scientific theories have been more successful and accepted than any of the prominent moral theories.[5] Metaethical realism, then, falls by the wayside.

Debunking arguments like these are articulated in at least two different ways:

a) The Argument from Dwindling Probability of Veridical Belief/Desire Pairings and

b) The Argument from Multiple Defeaters in Likelihood Analysis

As this paper progresses, I will provide analyses of these two debunking strategies. For now, it is enough to say that a-type debunking strategies point to the low probability of the sheer number of human judgments that would have to be veridical.[6] Secondly, b-type debunking strategies point to the large number of hypotheses that provide defeaters for the hypothesis that our judgments are veridical. Since it "could be otherwise" with regard to the truth-tracking of our judgments, we should, at the very least, withhold belief in the veridicality of our judgments.

Upon reading the argument above, one might discern that we cannot trust our judgments and thus reject scientific realism. Call this view unscientific incompatibilism.

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[3] The clearest version of this argument is given by Sharon Street.
[4] Further, this same argument can be given for aesthetics. See Howd.
[5] Street
[6] Street and Plantinga both provide this strategy.

But there are many moving parts to this challenge: 1) a belief in the general truth of the Theory of Evolution, 2) a belief in the relevant scope of the Theory of Evolution (enough to affect our judgments used when judging the veridicality of the Theory of Evolution), 3) a belief in naturalism—that our beliefs ought to be given an explanation or origin that appeals only to natural laws iterated in our best scientific theories, and 4) a belief that the mechanisms of evolution do not result psychologies that adequately and often make veridical judgments.

Against the strong wind of this kind of debunking argument, one might rummage through these commitments for ways to preserve one's beliefs in veridical judgments. The anti-Darwinian incompatibilists will deny (1): that the Theory of Evolution is a good theory; they will reject the debunking argument for resting on a false premise. A restrictive compatibilist will reject (2): that the Theory of Evolution has relevant scope. While the Theory of Evolution is mostly correct, they say, it is a mistake to think that our scientific theories can explain everything, including our veridical judgments. Whatever the explanation, though, it will be a natural one. These two answers run into an immediate difficulty: the debunking argument generalizes. For, whatever the cause of our evaluative judgments, the cause is not truth; truth is causally inert.[7] If, for example, we think the origin of our judgments is culture, we will see that cultural inheritance proceeds independently of truth, and thus lands once again in the teeth of the debunking argument above.

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[7] It has been pointed out to me that, while truths are causally inert, truth-makers are not. I think the debunker's response to this would be that we have no way of knowing whether or not we are engaging with genuine truth-makers due to our cognitive bias toward survival and fecundity.

Although the debunking argument is generalizable, I will focus on the debunking argument from evolution in this project. It is sometimes suggested that, since the debunking argument generalizes in this way, we need not bring evolution and its characteristics into the debate.[8] There are two reasons I will proceed with an evolutionary framing of this debate. First, many will accept the premise that the origin of at least many of our judgments is accurately explicable using the Theory of Evolution. Second, depending on *what* one thinks is the cause or origin of our judgments, this cause or origin will have its own epistemic features that will affect the outcome of our evaluation of the debunking argument.

As an example, consider the supernatural compatibilist. The supernatural compatibilist will deny (3) above: that our judgments can be given a natural explanation. They will appeal to veridical, non-natural explanations for our judgments— God or some other supernatural entity. Notice that, because God would be omniscient, all of His beliefs would be true. Thus, an origin of our beliefs that features God can, when coupled the plausibility of a non-deceptive God, be correctly described as truth-conducive.[9,10] Hence, depending on the ascribed origin, the debunking argument may fail or succeed.[11]

There are two further ways one could answer the debunking argument. A neo-Darwinian compatibilist might argue that, although our debunking argument gives us

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[8] Plantinga's argument, for example, points merely to the causal link between the firing of neural passages and behavior. The semantic content of the belief, he argues, need not be true in order to get the desired behavior.

[9] We might also include the supernatural incompatibilist: one who denies that the supernatural cause of our veridical judgments is truth-conducive—e.g. the Cartesian demon.

[10] Plantinga and Descartes both say something like this.

[11] I do not endorse this line of argumentation; it is meant only to be illustrative of why origin stories matter.

reason to doubt our veridical judgments, belief in them is still permissible. This is the first view I will pursue here. That is to say, for the purposes of this project, I will accept all four propositions previously mentioned while still arguing for the permissibility of the belief that our veridical judgments are somewhat veridical. This is not to say that I reject any other view mentioned above. Rather, I think one can derive the permissibility of our evaluative beliefs without appeal to any of the views given. Second, I will deny (4) above: that the mechanisms of evolution do not result in true judgments. This version of Neo-Darwinian compatibilism instead states that the processes of evolution are conducive to the truth of our veridical judgments. This paper will come in three parts: 1) I will provide a defense against a-type debunking arguments by accepting all premises of the debunking argument and argue that it is invalid, 2) I will establish a higher probability of naturalism, metanormative realism, and theory of evolution by rejecting (4)—that the mechanisms of evolution are not truth preserving, and 3) I will respond to objections, including one notable attempt to provide a debunking argument aiming at simplicity.

2   Formalization of A-type Debunking Arguments

The purpose of this section is to show how the a-type debunking arguments proceed. I will begin by characterizing a distinctive element of a-type debunking arguments: multitudes of unexplained correlations. Debunkers argue that, since our judgments evolved without regard for truth, every belief would have evolved randomly with regard to truth. Thus, to think that all of our beliefs are true is extremely unlikely. This, I think, is the genuine battleground on which a-type debunking debates will be settled. Later I will argue that debunkers have failed to validly calculate the large number of

unexplained truth-belief correlations needed. One will notice that a-type debunking strategies do not presuppose any *type* of veridical judgment in their argument. That is, this argument is purportedly useful for debunking scientific, ethical, aesthetics, and ordinary beliefs.

2.1   Implausible Correlations

Let us show, then, why the fact that evolution would form the psychology of organisms such that they "aim" at survival and reproduction, not truth, should give us considerable anxiety. Consider the following example given to us by Enoch (and formerly Field):

> "Suppose that Josh has many beliefs about a distant village in Nepal. And suppose that very often his beliefs about the village are true. Indeed, a very high proportion of his beliefs about this village are true, and he believes many of the truths about this village. In other words, there is a striking correlation between Josh's beliefs about that village and the truths about that village."[12]

The next step in a debunking argument is to ask for an explanation of this striking correlation. What could explain the fact that Josh's beliefs correlate so strikingly with truths about this village in Nepal? Perhaps Josh has been to this village or done thorough research of it. These answers explain the correlation well. But suppose, when asked, Josh responds "I have never been to Nepal, nor have I researched it. I just had a hunch that this was a good description of that village." Most of us would find this answer unacceptable. The hypothesis that the beliefs were developed through mere hunches is "too implausible to believe," given the *amount* of striking correlations between Josh's

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[12] Enoch 2010, 421; cf. Field 1989, 25-30

beliefs and truths about Nepal. Indeed, most of us would not believe Josh if he offered this explanation.

Let us now complete the analogy. We hypothesize that there is a striking correlation between our multitude of judgments and independent truths. Yet we have no epistemic access to these independent truths. Simply asserting that the multitude of beliefs track independent, causally inert truths on a hunch is "too implausible to believe." Thus, we should reevaluate our hypothesis that there is a striking correlation between our multitude of beliefs and independent, causally inert truths.

Plantinga gives examples to show how the Theory of Evolution could "aim" at survival and reproduction without tracking truth. Let us assume we want to make friends with a tiger, so we run away from it. We run away because we think running away from the tiger will make us friends with the tiger. Here, our actions allowed for greater survival and reproductive success, but our beliefs did not track the truth—we had a false belief. Why should the naturalist think our judgments are not of this sort if the aim of evolution is survival and reproduction? Further, notice that we have *many* correlations that need to be accounted for, indeed *all* human judgments have the possibility of being false while aiming at survival and reproduction. Just as in Josh's case, it starts to look extremely unlikely that *all* of these attitudes correlate with truths without explanation. To the objector who answers "it had to be some way" or "for all I know, all of my beliefs do track truth," debunkers answer that there are so many striking correlations required—one for each belief we have! It is too implausible to believe that all of these judgments randomly lined up with truths through a sort of justificatory occasionalism. Call this the argument from dwindling probability. It is here, I think, that a-type debunking arguments are most characteristic.

Once again, Josh could have been telling the truth when he said it was just a hunch. Perhaps Josh was in fact a psychic medium, as was thus using a veridical method of judgment. But an explanation like this would once again fall out of bounds for one who is committed to a naturalist position. Thus, answer like this cannot be given to solve the improbability.

2.2   Dwindling Probability

Now that I have developed the a-type debunking argument in natural language, I want to begin providing a probabilistic formalization. Some preliminary steps are needed. Let us first analyze the argument from dwindling probability discussed in the last section. As a reminder, we are trying to capture the idea that, given we have no epistemic access to certain truths, it is very unlikely all of them just happened to be true. This can be expressed mathematically by inference from the following definitions and axioms in probability theory.

The general multiplication rule of probability states that "the probability of an occurrence of two independent events is equal to the product of the probability of the occurrence of both events."

$$Pr(A\&B) = Pr(A)Pr(B)$$

By "independent events" we simply mean that the probability of one event does not affect the probability of another. Knowing that B happened does not change the probability of A.

$$Pr(A|B) = Pr(A)$$

Debunking arguments from dwindling probability are the logical consequence of the General Multiplication Rule: the probability of two or more independent propositions or

events held in conjunct is the product of the probabilities of those propositions or events. We can now derive the argument from dwindling probability from our axiom the probability of two or more independent propositions or events held in conjunct—that is to say, with an "&" in between—will be lower than the probability of the constitutive factors unless the probability of at least one of the conjuncts is 1 (100% probable). Put more simply, since we multiply probabilities to find the overall probability of independent propositions or events, the product of two or more probabilities represented as decimals will always be lower than any of the individual conjuncts. Call this the argument from dwindling probability.

To express it formally, let Pr mean "the probability of." Given that all variables used are independent and have a non-0, non-1 probability, the following is a necessary truth:

$$Pr(p) >> Pr(p \& q \& s \& t)$$

As an example, suppose one flips two fair coins. Since the result of the second flip does not depend on the result of the first flip, these flips are taken to be independent. Since the coin is fair, there is a 50% chance that the coin will land heads and a 50% chance that the coin will land tails. Thus, the probability of a single coin flipping heads is .50. What is the probability of flipping two heads? Multiply the probability of each attempt together—.50 x .50 = .25. So, the probability of flipping two heads is .25

Thus, when a-type debunkers point out that there is a striking correlation between what we think is true and our beliefs, he is right to point out that it would be absurd to think so many happened to correlate without explanation. For, the more beliefs we are not absolutely certain are true, the lower the probability it will be that they

are all true. Evolution, a-type debunkers contend, cannot provide an explanation for why our beliefs are generally true. They can only generally aid in survival and reproduction. Even if we did assign reasonably high prior probability to each of these correlations, the probability of the truth of all of them will rapidly decline since there are so many unexplained correlations between beliefs and truths. Thus, debunkers think we should reject the hypothesis that our beliefs are generally true, given that we are naturalists.

3   Against A-type Challenges

Now that I have concluded my reconstruction of a-type debunking arguments, I will turn to providing critical commentary. In this section, I will provide a defense of the epistemological consistency of naturalism and the Theory of Evolution concluding that debunkers have not validly calculated the improbability of naturalism and the theory of evolution, because they have falsely assumed the judgment-truth pairings are independent propositions.

3.1   Likelihood Formalization

It will be useful, then, to employ the law of likelihood to compare these hypotheses:

$$Pr(O|H_1) > Pr(O|H_2)$$

$Pr(O|H)$ is called the *likelihood* of H. Here, we need to be careful, as likelihood and probability mean identical things in the English language. "Likelihood" is a technical term denoting the probability of an observation *given* a hypothesis. To help grasp this

concept, consider an example Sober gives repeatedly.[13] Suppose I hear a lot of crashing around in the attic. After hearing the noise, I formulate the following hypothesis: perhaps there are gremlins bowling in the attic. What is the *likelihood* of the hypothesis that gremlins are bowling in the attic using our technical definition? The likelihood is very *high*. This is because the probability of our observation (that there is crashing around in the attic) *given* the probability of the hypothesis (that there are gremlins bowling in the attic) is very high. Indeed, if gremlins were bowling in the attic, I would expect a great deal of noise.

The likelihood formulation does not rely on the unbound hypothesis (Bayesian prior)—Pr(H). In short, the Law of Likelihood allows us to determine which hypothesis is more *likely* (in a technical sense) by merely forming *a priori* thought experiments. Since the Law of Likelihood has the tools to handle our debunking argument, and a-type debunking arguments from dwindling probability do not heavily rely on Bayesian priors, we will use the Law of Likelihood it in our formalization. Of course, since the Law of Likelihood is the main operator in Bayesian calculation, it will provide useful insight into how the probability will be calculated using Bayes' Theorem. I will turn to Bayes in a later section.

It is now finally time to use the Law of Likelihood to provide a probabilistic formalization of our debunking argument. A simple version of the debunking claim might look something like this.

$Pr(a \,\&\, b \,\&\, c \,\&\, d \,\&\, \ldots | H) \approx \downarrow$

Let us call the hypothesis that the Theory of Evolution explains our beliefs and "aims" at survival and reproduction (not truth) the *null hypothesis*—meaning that, as our debunkers argue, if any of our beliefs track truth, they do so at random. The formula above just indicates that the probability of all of the unexplained correlations between independent truths and our beliefs given the null hypothesis is extremely low. The justification for this claim is the argument from dwindling probability. Put simply, the likelihood of the belief-truth pairings is very low given the null hypothesis. I want to revise this slightly such that the set of formulae that stands in for our O on the left side of the pipe are symbolized with Γ for the sake of brevity:

$Pr(\Gamma|H) \approx \downarrow$

We are now left with a choice. We can deny the null hypothesis—that evolution "aims" at survival and reproduction (not truth) on the grounds that the probability is extremely low, or we can deny that our beliefs generally track truth. If we deny the null hypothesis, the received view is that our debunkers successfully show that naturalism is improbable if the Theory of Evolution is true. If we deny that our beliefs track truth, then our foundational beliefs from which we derived our confidence in the Theory of Evolution are random with regard to truth. The probability of them being correct is seemingly extremely low. Therefore, it is argued that the probability that the Theory of Evolution is epistemically justified is very low and it should be rejected. Again, our debunkers seem to demonstrate the inconsistency of naturalism with the Theory of Evolution.

Do debunkers think we should all be complete skeptics? Plantinga prefers to deny naturalism and reconstruct our probabilistic formula as follows:

$Pr(\Gamma|H_G) >> Pr(\Gamma|H_N)$

Let H_N be the null hypothesis and H_G be the God hypothesis. Plantinga, a supernatural compatibilist, reasons as follows. If we deny naturalism, we can posit some supernatural explanation for the reason we can trust our beliefs. The formula above simply reads: the probability of our beliefs correlating with outside truths given the evolutionary null hypothesis is much less than the probability of our beliefs correlating with outside truths given the God hypothesis. The God hypothesis is the thought that if God exists, He could be the cause of our beliefs and ensure that they are truth-tracking. Since there is no longer a plethora of unexplained correlations between our beliefs and outside truths (God explains this correlation), the likelihood of the God hypothesis is much higher than the evolutionary null hypothesis (via the argument from dwindling probability). Therefore, via inference to the best explanation, the argument indicates that we should believe the God hypothesis a great deal more than the evolutionary null hypothesis.

3.2   Overestimated Number of Correlations

But we need not employ the null hypothesis for our likelihood comparison. Let us recall the gremlin example. Remember that the likelihood of a hypothesis can be very high even if the hypothesis seems strange. If I hear banging around in the attic, the likelihood of gremlins bowling in the attic is quite high, even if the *prior* and *posterior* probability are quite low. But suppose I add a further hypothesis. Perhaps some books in the attic were not stacked well enough and eventually succumbed to gravity, banging around in the process. While this is a more *probable* scenario, this is only the case because one has applied a Bayesian prior probability to each hypothesis.[14] In fact, we can imagine a

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[14] I will get more in-depth into Bayes later.

scenario where the observation is such that the likelihood of the gremlin hypothesis and the book-falling hypothesis are *identical*.

Let us now provide a further hypothesis to the likelihood analysis of the a-type debunking argument. Let H_T be the hypothesis that evolution tracks-truth. Importantly, this hypothesis is not identical to the null hypothesis. A proponent of H_T might say something like this: there is something about the unfolding of evolution such that our beliefs are generally required to track truths, and they do so without appeal to any supernatural property or cause. Perhaps, for example, survival and fecundity, and veridical judgments, regularly occur together either by some causal connection or due to some outside causal influences acting on them both. Recall that, when comparing the likelihood of hypotheses, in the technical sense, we only take into account the probability of the observation given hypotheses (remember the gremlin bowling example above). We do not take into account any prior probability of the hypotheses and we do not calculate the probability of the hypothesis given the observations with the Bayesian theorem.

Since we have eliminated the large number of unexplained correlations between beliefs and truths, H_T will then be related to the null hypothesis H_N as follows:

$Pr(\Gamma|H_T) >> Pr(\Gamma|H_N)$

Furthermore, since the observational content of naturalistic truth-tracking can be made identical to the observation of the theistic truth-tracking in the God hypothesis, I can also speculate the following relationship:

$Pr(\Gamma|H_T) \approx Pr(\Gamma|H_G)$

The likelihood of naturalistic truth-tracking is identical to the likelihood of theistic truth-tracking. More hypotheses could be added, of course. One might think that some

atheistic, non-natural teleology tracks truth and can be of identical likelihood to the two hypotheses above. This is true, but for now let us stick with these two.

I conclude, then, that the natural truth-tracking hypothesis is much more likely than the null hypothesis and that natural truth-tracking hypotheses are just as likely as non-naturalistic truth-tracking hypotheses. Thus, I argue, our a-type debunking argument fails to validly calculate the extreme improbability of the belief in the Theory of Evolution and naturalism.

The argument from dwindling probability does not apply to my hypothesis, as I admit that evolution is, in some way, truth-tracking; there are no unexplained correlations between beliefs and independent truths. As explained earlier, the success of a-type debunking arguments hinges on the independence of the variables—correlations between beliefs and truths. My hypothesis is that these correlations are not independent, but rather that they are all true because evolution tracks truth. If my hypothesis is true, then all of the events are related, and therefore the multiplication rule of probability does not apply in the same way. Instead, there is only one unexplained correlation—the belief that evolution is somewhat truth-tracking. The mistake of the a-type debunking argument is the assumption that all naturalistic hypotheses necessarily cannot include a truth-tracking clause. I see no reason for this to be the case.

Moreover, it is never the case that the argument from dwindling probability can be applied to any non-null hypothesis. This is because observations taken as evidence for a hypothesis are assumed (by their role of taking part as pieces of evidence for hypotheses) as non-independent events. Suppose I hear some banging around in the attic and I hypothesize that gremlins are bowling in the attic. Perhaps, I imagine, later I

hear banging around again. Later still, I imagine, I see some bowling pins fall down the ladder that leads to the attic. Since this is a thought experiment, I never truly observe the banging around or the pins falling down the ladder. But I know *a priori* that if gremlins were bowling in the attic, the probability of all of these observations would be very high even when held in conjunct. This is because the observations are not independent, they depend on an antecedent (non-null) hypothesis that predicts the dependence of observations on one another. The argument from dwindling probability, on the other hand, is useful only when determining frequency of observation given that there is no dependency among the observations. So, the argument from dwindling probability does not apply to likelihood (or Bayesian) probability calculus given non-null hypotheses. Thus, the argument from dwindling probability does not apply to H_T.

The same sort of maneuver can be made in defending ethical beliefs from a-type debunking arguments. Under the hypothesis that evolution is somewhat good, that is, it produces psychologies that generally favor good actions, it follows that each ethical belief is dependent on the single hypothesis that evolution is somewhat good. Thus, there is no dwindling probability to be found.[15]

One may be immediately struck by the following objection: although you have significantly raised the probability of naturalism and metanormative realism in the face of A-type debunking arguments, you do so by assuming that the hypothesis that evolution tracks truth is somehow coherent. Why should one think "evolution tracks truth" is a viable hypothesis at all, given there are many other ways it could have been?

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[15] Enoch makes this argument on 430-431.

Thus far, I have only succeeded in pushing the argument up one level. This argument is a B-type debunking argument and it is the topic of the next section.

4   Formalization of B-type Arguments

The purpose of this section is to respond to B-type debunking arguments: arguments from multiple defeaters in likelihood analysis. I will explain and formalize B-type debunking arguments—the claim that the existence of many other hypotheses in which evolution does not track truth lowers the probability that evolution is truth-tracking—before providing a Bayesian defense of the permissibility of belief in naturalism in conjunction with metanormative realism. After that, I will consider a strong objection to the use of the Bayesian prior in this context, and argue that we can still establish the permissibility of belief in naturalism in conjunction with metanormative realism with a mere likelihood analysis (with no Bayesian prior).

4.1   Too Many Hypotheses

The b-type epistemological challenge is expressed with the following question: why should I think that evolution tracks truth? First, I want to stress that there is no logical inconsistency in claiming that it does. Some debunkers may claim that, because evolution aims at survival and reproduction, there is some sort of inherent inconsistency in claiming that it also tracks truth. This is not so. Neither Darwin's Theory of Evolution nor neo-Darwinian accounts of human psychology ever mention the truth or falsity of

beliefs acquired through evolution. Thus, it cannot be *logically* inconsistent with the theories that our beliefs are somewhat true.[16]

However, there is, b-type debunkers argue, a low probability of naturalism in conjunction with truth of our beliefs even given the salience of a hypothesis that evolution tracks truth. This is because there are defeaters for that hypothesis. That is, there is the hypothesis that evolution is truth-tracking, that evolution is not truth-tracking, and a spectrum of cases where evolution is somewhat truth-tracking—from often to rarely. In the face of all these other ways it could have been, we should withhold belief in metanormative realism in conjunction with naturalism.

To illustrate the b-type debunking argument, consider the following analogy. Suppose you select a card at random from a deck of normal playing cards. You cannot look at the card, nor the other cards in the deck. Once a card is selected, you have the opportunity to hypothesize what the card is. Suppose you hypothesize that the card is the three of clubs. There is a one in sixty-four chance that you selected the three of clubs. But is it permissible to *believe* that you have selected the three of clubs before the card is revealed? Since all of the cards have an equal chance of being selected, you must divide by the number of possible outcomes: 1/64 = Pr(.015625). Since the probability is so low, and equal to the probability of any other given possibility, it is best to withhold belief on the identity of the card. It is impermissible to believe the card is the three of clubs.

To complete the analogy, then, there are many different competing hypotheses that explain our belief-truth relationship. Since we cannot observe the belief-truth relationship (we cannot observe when our beliefs link to truth and when they do not),

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[16] This is why it is possible to generalize epistemological concerns. No natural explanations of our beliefs ever contain truth correlates.

we must assign each hypothesis an approximately equal veridical. Since all veridicals are approximately equal, we must divide by the number of competitive hypothesis—non-truth-tracking conceptions of evolution. Thus, the probability for the truth-tracking hypothesis is one in x where x is the number of competing hypotheses. The calculation will be 1/x, resulting in a low probability of the truth-tracking hypothesis and an approximately identical probability for each other non-truth-tracking hypothesis. We must therefore, debunkers think, withhold belief in the truth-tracking hypothesis; it is impermissible to believe it.

In formal language, b-type debunking arguments look like this:

$\Pr(O|H_1) \approx \Pr(O|H_2) \approx \Pr(O|H_3) \approx \Pr(O|H_4)$ ... etc.

Here, O just indicates data—all beliefs, observations, and any other form of data. Since all of the data is *identical* given any of these hypothesis—we will have the same experiences, observations, attitudes...etc. under any of the hypotheses—the probability of all hypotheses, truth-tracking or not, will have approximately equal probability. It is possible here to inject another argument from dwindling probability. That is, one might argue that, since there are so many hypotheses, the probability dwindles further for each individual hypothesis. But it is important to note that b-type debunking arguments do not necessarily rely on an argument from dwindling probability. That is, it does not necessarily matter how *many* competing hypotheses there are with approximately identical probabilities, though it does help. One would need to withhold belief even if there are just two hypotheses with equal probability in order to be rational. Suppose I flip a fair coin at there is a fifty percent chance it will land heads and a fifty percent chance it will land on tails. Still, it is impermissible to believe that the coin *will* land heads. You must withhold belief given the salience of defeaters.

5   Philosophical Bayesianism

Thus far, we have not engaged with any real philosophical commitments in formal epistemology; we have simply drawn on uncontroversial probabilistic premises to form epistemological challenges. There are three major stances on how probability informs our epistemological stances: Bayesianism, Likelihoodism, and Frequentism. Each view is mathematically sound, but there is disagreement about which, if any, is useful for informing our degree of belief in some proposition or theory. The vast majority of philosophers who think probability theory is useful in adequately informing our beliefs accept philosophical Bayesianism. In this section, I will first argue that Bayesians have a quick answer to b-type epistemological challenges. After this, I will consider potential objections to the Bayesian answer.

5.1   Bayes' Theorem

Philosophical Bayesianism employs Bayes' Theorem:

$$\Pr(H|O) = \frac{\Pr(O|H)\,\Pr(H)}{\Pr(O)}$$

This formula calculates the *posterior probability* of the hypothesis in question: Pr(H|O). To see how the posterior probability relates to the likelihood—Pr(O|H)—once again we should recall the gremlin example. We saw earlier that the likelihood of gremlins bowling in the attic was quite high, since likelihood just refers to the probability that we would hear banging around in the attic *given* that gremlins are bowling in the attic. The posterior probability is the stronger and more comfortable use of probability—the probability that there are gremlins bowling in the attic *given* we hear

banging around in the attic. Using Bayes' Theorem, then, we can come to the more intuitive conclusion that the probability of gremlins bowling in the attic is quite low.

In order to calculate the posterior probability, we need the likelihood with which we are already familiar with—Pr(O|H)—as well as two other new bits of information: 1) the probability of the unbound hypothesis—Pr(H)—and the probability of unbound observations—Pr(O). The probability of the unbound hypothesis, known as the *prior probability*, is aggregated in various ways I will explain later. For now, suffice to say that prior probability often amounts to the credence you give a theory *before* observation takes place. Most of the time, these priors have been affected by previous calculations and thus previous observations. Sometimes, however, Bayesian prior probabilities are applied despite *any* observations. Thus, they are sometimes dependent on one's psychological affinity for a certain theory. The probability of the observation is usually always taken to be one, as we always assume when using the theory that we have careful observations. However, it need not be the case that Pr(O) must be the probability of an observation; any proposition will do.

One final note about the Bayesian Theorem: there are several views about how the resulting posterior probability, which will in most cases be some sort of decimal, informs our beliefs. What is the cutoff point for where I am required to change my beliefs? Perhaps I should change them at .51 or so. The honest answer is that there is no are no cutoff points for when one is required to belief or disbelief in the hypothesis. Some Bayesians think that probabilities should be *degrees* of belief or credence. A .51 probability requires me to be fifty-one percent sure of the hypothesis. I will be continuing without committing to any particular view on this issue.

5.2   The Bayesian Answer

How might a Bayesian use their commitment to the Bayesian theorem to provide a defense against b-type debunking arguments? As a reminder, we are evaluating the argument that, since there are several defeaters for the hypothesis that evolution tracks truth, it is impermissible to believe that it does; we must withhold belief in the hypothesis that evolution tracks truth.

As stated earlier, when using the Bayesian Theorem, we always assume the probability of observations is 1 because we observe them. The theory assumes considerable care has been taken to make sure our observations are accurate. But in our debunking argument, we do not have access to such observations. This is because the variable *O* stands in for the proposition that our beliefs are truth tracking (or not, depending on the hypothesis employed). It is clear that we can *never* observe the correlation between our basic beliefs and truths. Thus, it is not possible to make use of unqualified observations. There are ways to develop the denominator of Bayes' Theorem without using the unqualified observations like Pr(O). We might instead place the following in the denominator of our equation: Pr(H)Pr(O|H)+Pr(~H)Pr(O|~H). Here, we can express the denominator without need for unqualified observations. Still, in this equation, the probability of *O* will be identical given both *H* and *~H* since we will have the very same experiences and data whether our beliefs track truth or not.

This means that, thus far, we have established both that the likelihood (in the technical sense) of the hypothesis that evolution tracks truth is approximately identical to any other degree of truth-belief relationship, and that the observations will be unhelpful because all of the data will be the same given under all hypotheses. This leaves

us with the only other unused operator in the Bayesian Theorem: the *prior* probability of our hypotheses.

But since the prior probability of *H* in this case cannot be derived from anything other than psychological affinity, it seems that there will most always be more credence given to the belief that evolution tracks truth than any other competing theory. Why is this so? Because most everyone trusts that their beliefs are somewhat true! Those who believe in evolution think their beliefs are somewhat true, those who believe in naturalism think their beliefs are somewhat true, and those who believe in metanormative realism think their beliefs are somewhat true prior to any disconfirming observation.

The result is that, even if the prior probability of the hypothesis that evolution tracks truth is raised just a miniscule amount, it will be the most probable hypothesis:

$$Pr(O|H_1) > Pr(O|H_2)$$

$$Pr(O|H_1) > Pr(O|H_3)$$

...etc.

Since the hypothesis that evolution tracks truth has the highest prior probability, it will have the highest posterior probability, all else equal. Furthermore, the Bayesian argues, it is at least permissible to believe the theory with the highest probability. Thus, it is permissible to believe that evolution is truth-tracking.

Again, the same argument can be framed to favor metaethical realism as well. Since the hypothesis that evolution is somewhat good has the highest prior probability (we believe our ethical beliefs are true), it will have the highest posterior probability, all

else equal. Thus, it is at least permissible to believe that evolution is somewhat good-tracking.

5.3   Two Objections

Let us briefly address two objections to the Bayesian reasoning. First, one might argue that we have data that shows that our beliefs are non-veridical due to evolutionary influence. For example, we see that it is much less likely for organisms (including humans) to mate with any individuals who are around them while they are young. The leading hypothesis for why this is the case is because evolution has overcorrected for disallowing incest, which would be problematic for the survival of the offspring. However, it would not be problematic for organisms to mate with individuals unrelated to them who were around them while growing up, but nonetheless this is what we observe. While this attitude is helpful for survival and reproduction, it is not truth-sensitive.[17]

Here, it is important to remember that I am only trying to defend the hypothesis that our beliefs are *somewhat* or *generally* truth-tracking. It is this general ability for our beliefs to track truth that gives us the ability to know that evolution is somewhat true. This, furthermore, gives us the ability to provide evolutionary explanations for situations where our judgments are, in fact, faulty. It is a matter of empirical exploration which of our beliefs are generally truth-tracking and which are not. This exploration, of course, could not take place without begging the question if the debunking argument

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[17] Thank you to Johnna McGovern for this objection.

succeeds. The fact that we are able to discern which beliefs are faulty and which beliefs are veridical is a testament to the fact that we do generally trust in our judgments.

Second, one might argue that Bayesians have no right to designate the prior probability of the hypothesis that evolution is truth-tracking as they have. The question is: how do we determine the plausibility of H before we incorporate our observations; how are these priors aggregated? There is no clear answer to this question and the priors can vary from person to person. The incorporation of the Bayesian prior at least gives us reason to take pause when applying this method to our debunking argument. After all, part of our puzzle is the hypothesis that we are trying to establish that our beliefs are truth-tracking. Therefore, any aggregation of a prior probability begs the question; it assumes the hypothesis that my beliefs are in some way veridical, so it slightly raises the probability. Thus, it might be argued, they will not be extremely useful in this particular argument. If ever there was a time to doubt the usefulness of a Bayesian prior, it is when arguing about the legitimacy of priors! Further, if the debunkers succeed, it looks like there is *never* a good time to apply a Bayesian prior so long as one believes in the theory of evolution. For, any prior probability will be formed using a non-veridical method.

This kind of objection, I think, will not phase many Bayesians. Prior probability has already been thoroughly criticized by Likelihoodists as being a radically internalist notion. Bayesians have come to terms with this, but maintain that this is how posterior probability must be calculated in theory selection. They are well aware that prior probabilities are often highly subjective and may be formed under non-veridical processes. For the Bayesian, this is still the best way the calculate probability, and thus

yet another attack on the non-veridical nature of the Bayesian prior is inconsequential, even if the argument is explicitly about the truth of our beliefs.

Still, many (including myself) will find this answer less than satisfying. I am somewhat moved by the argument that prior probabilities, defined as psychological affinities, cannot be used in a probabilistic argument for the veridicality of our psychological affinities, especially not when it is the *only* consequential variable of the calculation. But perhaps I have shown that the belief in the hypothesis that evolution tracks truth is at least permissible. Furthermore, it is likely unsatisfying for many that I have not explained how on earth our beliefs *could* track truth so well. While I do not think providing an account like this is necessary to allow for the permissibility of belief in the hypothesis that evolution is truth-tracking, I will still take up this project in the next section. Can we establish a higher probability for the hypothesis that evolution tracks truth using only likelihood analyses?

6 Closing the Explanatory Gap

There is one more way we might raise the probability of the conjunction of naturalism and metanormative realism. It requires a two-step process: 1) we must provide an explanation of *how* our beliefs could track-truth in wake of the Theory of Evolution and 2) we must show that this explanation is more probable than other non-truth-tracking explanations of our beliefs. How might one go about giving reason to believe the hypothesis that evolution is truth-tracking?

6.1 Evolution and Cognitive Generality

The trick to raising the probability of naturalism and the Theory of Evolution is to provide a story of how survival and truth would often occur together. But we cannot appeal to causation because, as stated before, truth is causally inert; it cannot cause anything. As we have also seen from Plantinga's examples, an "aim" of survival does not guarantee truth-tracking in case-by-case microanalyses. What we need, then, is an explanation for why truth and survival would occur together that appeals to a common cause or regularity.

The first thing to notice is the sheer number of beliefs, and potential actions based on beliefs, animals of our cognitive capacity are capable of. Furthermore, our beliefs and attitudes are keenly adjusted based on minute differences between potential situations. In fact, we are capable of believing and acting in an infinite number of possible scenarios. It follows that it cannot be the case that we have a different cognitive process for every situation, as our brains are finite entities. If our cognitive processes evolved to suit exact situations on a case-by-case basis, the processes would be impossibly complex given the mental machinery we have.[18]

Second, we embrace a premise given to us by evolution: that a large number of our beliefs evolved under the pressure associated with evolution. Put together, we find that although our cognitive processes did not evolve to suit exact situations on a case-by-case basis, these processes have still evolved to "aim" at survival and fecundity. Thus, we see that there must be a sort of decision apparatus that is applicable, or *generalizable*, to many different and close cases.

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[18] This may be what Fales is getting at [Fales 433].

This provides a unique problem for debunkers because it will no longer do to simply point out *a priori* examples of how survival and truth can come apart, for evolution does not produce beliefs on a case-by-case basis. As an example, consider Plantinga's case of running away from the tiger because you want to be friends with it. Here, we have a false belief that running away from something makes us friends, but it still promotes successful action. Lo and behold! We need not have truth to promote successful action. But consider another situation in which we want to be friends with a potential mate, so we run away from them. This example shows that Plantinga's case is non-generalizable; it relies on very specific, situational features. As said earlier, evolution does not operate at this individual level, but must produce *general* cognitive processes.

So, we must ask the following question: how could this kind of general decision-making apparatus reliably produce beliefs and actions that "aim" at survival and fecundity, as we admit and observe that it does? Why is it not the case that about half of our actions produce beliefs good for survival and fecundity while the other half produce counterproductive action? Clearly it is because other cognitive apparatuses were weeded out via natural selection. But *why* are the apparatuses honed if not on a case-by-case basis?

Philosopher Evan Fales has a potential answer for us:

> "In a valid argument, true premises guarantee true conclusions: so a system that relies consistently upon true inputs to guide inference and action can employ general rules and hope to get things (i.e., action) right. But when a deductive argument employs false premises, the truth-value of the conclusion is

random. Thus there cannot be any set of general algorithms which get a creature to use the conclusion of such arguments in a way that reliably promotes successful action. A cognitive system which is not extremely limited in the inferential procedures it employs must either give up all hope of successfully directing action or become unintelligibly complex and ad hoc in its procedures for connecting belief to action."[19]

It is because our cognitive processes generally track truth that they are generally able to promote successful action. Call this the argument from cognitive generality. Furthermore, just as the debunkers have done in previous sections, we can here inject an argument from dwindling probability. If we had a judgment apparatus that regularly employed false premises, our propensity to act with the "aim" of survival and reproduction would be *random*. Since there is a striking correlation between our actions and those actions that have the "aim" of survival and reproduction, the probability that our beliefs are regularly false is astronomically low.

Again, the same kind of argument can be made for metaethical realism, but it will require a justification for the premise that evolution is somewhat good-tracking. Consider the following argument. It is hard to deny that surviving is *good for* any particular species or organism. Furthermore, most will agree that there is an extricable link between the *good for* and the *good*. Thus, one of the aims of evolution is survival, it follows that evolution would be somewhat good-tracking. The rest is left to us to sort out through elimination of inconsistencies and testing of consequences.[20]

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[19] Fales 1996, 443, c.f. Graber, Golemon 2019
[20] This is just a rough sketch. For more on this argument, see Enoch 430-435.

6.3   Objection: The Causal Role of Belief Content

In response to the argument from cognitive generality, the strategy of the debunkers has been to point to an explanatory gap in the causal role of belief content when determining our actions. It is, they think, "extremely hard to see … how it could be that the content of a belief … plays a role in the causation of the behavior."[21] After all, many of us, including evolutionists, hold some version of epiphenomenalism. That is, "the view that mental events are caused by physical events in the brain, but have no effects upon any physical events."[22] Thus, the argument holds, it cannot be the case that the truth of the beliefs played a causal role in our behavior's ability to consistently "aim" at survival and fecundity; the argument from cognitive generality fails.

The simple response to this objection is that it is invalid. I believe that debunkers are correct when they say that truth can play no *causal* role in determining behaviors, but the argument from cognitive generality can get off the ground without need for truth playing any causal role whatever. For example, suppose I am sitting on a bench outside of a small town's townhall. Suddenly, through a display in front of the building, tiny wooden figures of people emerge from tiny wooden buildings and dance about. At the same time, real humans emerge from real buildings in the town and begin to pace about. I might ask myself "how did the display cause the people in the town to pace about?" or "how did the people in the town cause the figures in the display to dance about?" only to find that the causal link between the two is mysterious. This line of questioning,

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[21] Plantinga 253; cf. 272
[22] Lifted from the SEP

however, ignores the real fact about why the events have occurred at the same time—the clock has just struck noon.

The general truth of our beliefs is related to the success of our actions to produce survival and fecundity in a similar way that the wooden people and the real people are related. It is not that the content of beliefs is playing a role in the causation of behavior "aimed" at survival and fecundity. Rather, true beliefs and behavior "aimed" at survival and fecundity appear together for some further reason: the structure of logic dictates that false beliefs employed in practical syllogisms will result in a random action with regard to whether an "aim" is satisfied. Just as true premises in arguments do not *cause* true conclusions, the truth of our beliefs did not *cause* consistency of "survival-aimed" behavior. Rather, the logical structure of the world dictates their coupling.

This concludes my discussion of how we might raise the probability of the hypothesis that our beliefs are truth-tracking. The argument from cognitive generality shows that it would be extremely improbable for us to act so reliably with the "aim" of survival and reproduction if we were employing false beliefs. It follows that b-type debunking arguments from multiple defeaters in likelihood analysis fail to demonstrate the low probability of the conjunction of naturalism and metanormative realism. For the remainder of this project, I will take a look at one more attempt to save the debunking argument—this time aimed at the non-veridical nature of simplicity in scientific theory selection.

7   Simplicity in Scientific Theory Selection

There is one final argument I would like to address in this project. In *Plantinga Redux: Is the Scientific Realist Committed to the Rejection of Naturalism*? Graber and

Golemon attempt to provide a debunking argument that avoids responses like the ones I have given. Graber and Golemon seem to agree with everything I have said thus far. Their strategy is instead to try to get around the response I have offered above without confronting it directly. It will thus be useful to briefly respond to their project.

7.1   Is Simplicity Non-veridical?

Graber and Golemon write:

1) If a wholly naturalistic account of human etiology is accurate, then there is no tenable explanation of the correlation between our preference for simplicity and simplicity's ability to serve as a veridical method for theory selection.

2) If there is no tenable explanation of the correlation between our preference for simplicity and simplicity's ability to serve as a veridical method for theory selection, then this correlation is 'too miraculous to believe' and simplicity is likely not a veridical method of theory selection

3) If simplicity is likely not a veridical method of theory selection, then scientific realism is false.

4) Therefore, if a wholly naturalistic account of human etiology is accurate, then scientific realism is false [Graber, Golemon 4].

We are then expected to derive from the conclusion that realism about the Theory of Evolution is inaccurate, since the Theory of Evolution is one of our best scientific theories and scientific realism purports that our best scientific theories are somewhat true. This argument skirts the argument from cognitive generality criticism while still getting a debunking conclusion.

Immediately, I want to take aim at premise one. The sense I gather is that, whatever the definition of simplicity is, naturalism cannot account for it. But it would be hard to deny that a definition of simplicity, specifically as simplicity relates to theory selection, would have to include at least that one's theory has the least possible number of unjustified assumptions. Call this definition Occam's Razor (I am not sure if Occam would directly support this). The only objection I have seen to this position is that it just doesn't say enough for why we think simplicity is important. That may be true, but it is at least agreed upon that Occam's Razor is an important part of why simplicity is veridical for scientific theory selection.

But notice that we have already explained why Occam's Razor is a veridical method for theory selection: it is the logical consequence of the multiplication rule of probability. The more independent, unjustified assumptions one has, the less likely they are to be true when held in conjunct. This is because the probability that the assumptions are true are somewhere between 0 and 1 and the assumptions are independent. All theories of how probability can inform belief accept this mathematical necessity. If it is mathematically necessary that simplicity is veridical, then premise one of W is necessarily false; there is a tenable explanation of the correlation between our preference for simplicity and simplicity's ability to serve as a veridical method of theory selection—it resulted in better theoretical reasoning.

Furthermore, the language of the Graber-Golemon article indicates that they believe the criticisms like mine above rebutted many debunkers. This is why they have elected to try to skirt the argument with a new debunking argument. But if simplicity is non-veridical, then all of these responses I have given to debunking arguments are unsound—it relies on the argument from dwindling probability and a large number of

unexplained correlations. Debunkers, too, use this same method of argument from dwindling probability. Thus, I conclude that if we are to accept the Graber-Golemon argument for the non-veridical nature of simplicity, we will not have skirted anything, but refuted all arguments from probability given thus far. Indeed, Graber and Golemon's own argument refutes simplicity as a useful method by using the premise (2) that complexity is less probable.

8   Conclusion

So much for the probability of naturalism and metanormative realism. In summary, I have argued that a-type debunking arguments overestimate the number of correlations needed to think evolution naturally tracks truth, such that the argument from dwindling probability does not apply. Second, I have argued that, without this argument from dwindling probability, Bayesians can respond to b-type debunking arguments by deriving the permissibility of belief in naturalism and the Theory of Evolution through use of their prior. Third, I have argued that truth will track evolutionary success due to the low probability of producing accurate "aims" using false inputs, although there is no causal link between truth and evolutionary "aims". Finally, I have argued that there is at least some reason to think simplicity, construed properly, is a veridical method of theory selection.

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