On the Difficulty of the Evolutionary Debunking of Scientific Realism: Graber and Golemon Buttressed

Luke Golemon[1] · Abraham Graber[2]

Abstract

In their recent article, Graber and Golemon (*Sophia* 1–18, 2019) argue that any attempted evolutionary debunking of naturalism faces a dilemma. First, in order to be evolutionarily plausible, the skeptical implications must not be too broad. Second, in order to constitute a genuine challenge to scientific realism, the skeptical implications must not be too narrow. Graber and Golemon further develop an evolutionary debunking argument that avoids both horns of this dilemma. De Ray (*Erkenntnis* 1–21, 2020) criticizes Graber and Golemon's debunking argument then develops his own, competing debunking argument. We first respond to de Ray's criticisms by showing how Graber and Golemon's argument can be extended so as to avoid de Ray's critique. We then show that de Ray's argument debunking argument is impaled by both horns of Graber and Golemon's dilemma. The ultimate result will be both a better understanding of the desiderata and the argumentative contours of a successful evolutionary debunking argument.

Introduction

The evolutionary debunking of naturalism faces a dilemma. If a debunking argument has a broad skeptical conclusion, it is evolutionarily implausible; there is no algorithm that would allow an organism to move from false premises to reliably successful behavior. If a debunking argument has a narrow skeptical conclusion, it is unlikely to constitute a broad enough challenge to undermine naturalism (Graber & Golemon, 2019). Nonetheless, Graber and Golemon argue that a debunking argument targeting simplicity as a tool of theory selection can thread the horns of this dilemma.

✉ Abraham Graber
abraham.graber@utsa.edu

Luke Golemon
lgolemon@email.arizona.edu

[1] Department of Philosophy, University of Arizona, Tucson, AZ, USA

[2] Department of Philosophy and Classics, University of Texas at San Antonio, San Antonio, TX, USA

De Ray (2020) criticizes Graber and Golemon's skeptical emphasis on simplicity. De Ray further offers a competing debunking argument. In this paper, we will show that (i) Graber and Golemon's argument can be expanded to target all of the super-empirical virtues and thus avoid de Ray's criticism and (ii) de Ray's attempted debunking of scientific realism is impaled by both horns of Graber and Golemon's dilemma.

Graber and Golemon's Debunking Argument

Graber and Golemon's (2019) debunking argument occurs in two stages. They first argue, via two routes, that scientific realism requires that simplicity be truth-conducive for theory selection. First, they argue that simplicity plays an essential role in solving the challenge presented by the underdetermination of theory by evidence. Second, they provide evidence that, as a matter of historical and contemporary fact, simplicity plays a pivotal role in theory selection. But if simplicity plays a pivotal role in theory selection, then it would be a miracle if simplicity was not truth-conducive and our best scientific theories still came out true.

Graber and Golemon then argue that any etiological story of our preference for simplicity faces a dilemma:

> The etiological account may explain the genesis of our preference for simplicity without reference to truth or it may include truth-conduciveness as part of the etiological story. If the etiology does not include reference to truth, it would be pure luck if our preference for simplicity happened to also serve as a veridical method of theory selection in the empirical sciences. (2019, p. 14)

Furthermore, options for an etiological story that includes truth-conduciveness are limited. Our preference for simplicity pre-dates our first approximately true scientific theory (ibid). Consequently, the etiology of our preference for simplicity did not involve simplicity's reliability in the selection of scientific theories.

Other routes for an etiological story are not promising. Simplicity may be truth-conducive when selecting between explanations in domains like mathematics, folk psychology, and folk physics. Yet, it is difficult to see why a veridical method of theory selection in mathematics, the paradigm of a priori inquiry, would also be veridical in the empirical sciences. Similarly, it is difficult to see why a truth-conducive method of selecting among folk psychological explanations would similarly be truth-conducive in, e.g., particle physics. It follows that we lack a compelling naturalistic account of the etiology of our preference for simplicity.

Reevaluating Graber and Golemon

De Ray criticizes Graber and Golemon's emphasis on simplicity: 'It has been argued that appeals to a criterion of "simplicity" by scientists in theory selection are really appeals to coherence with background beliefs' (2020, p. 17). If de Ray is correct and simplicity is used in theory selection only as a proxy for some other epistemic property, Graber and Golemon's debunking argument likely falls flat.

While controversy surrounds each putative super-empirical virtue, there is little controversy that the super-empirical virtues (whatever they turn out to be) are essential to inference to the best explanation (IBE) and scientific practice. If Graber and Golemon's argument can be expanded to encompass most of the super-empirical virtues, it would be a significant boon to their project.

The fact that our preference for simplicity pre-dates our first approximately true scientific theories is a key to their argument. In order to extend their argument to the other super-empirical virtues, one would need to show that our preference for the super-empirical virtues pre-dated our first approximately true scientific theory.

A predilection toward IBE, like deductive reasoning and track record arguments, is deeply rooted in our cognition (Lipton, 2004). Assuming that pre-modern hominids shared our rough cognitive architecture, our disposition to reason using IBE would have pre-dated our first approximately true scientific theory. Furthermore, the super-empirical virtues are an essential feature of IBE. Thus, if our disposition to reason using IBE pre-dated our first approximately true scientific theory, the same would be true of our preference for the super-empirical virtues. It is now a short step to showing that each super-empirical virtue will face the same dilemma as simplicity.

On the first horn, the etiological story of our preference for the super-empirical virtues does not include the virtues being truth-conducive. Without a link to truth, the supposition that the super-empirical virtues are apt theory desiderata is too miraculous to believe.

On the second horn, the etiological account offered does involve the super-empirical virtues being truth-conducive. But because our preferences for the super-empirical virtues pre-date our first approximately true scientific theory, the genesis of these preferences cannot be explained by their veridical role in scientific theory selection. Instead, the account will have to focus on its veridical role in selecting among explanations in some non-scientific realm, e.g., folk psychology. As before, just as it is implausible to think that the methods developed for cellular biology would be truth-apt in particle physics, it is difficult to see why a method of theory selection fine-tuned for mathematics or folk psychology would be reliable in the empirical sciences.

Extending the argument in this way both answers de Ray's concern and offers its own advantage. Because scientists use multiple theoretical virtues in theory selection, even if we can vindicate *some* super-empirical virtues, we may, nonetheless, find ourselves relying on desiderata for theory selection that are innocuous at best, systematically misleading at worst. What is needed is a full throated defense of *all* of the super-empirical virtues; if even a few cannot be vindicated, the debunking argument likely wins the day.

Two Constraints on Debunking

Not only can Graber and Golemon's argument be strengthened by being extended to encompass all of the super-empirical virtues, there is little available space for developing a competing attempt to debunk naturalism. Graber and Golemon (2019) have argued that any debunking argument must pass between a *Charybdis* and a *Scylla*. The skeptical conclusion of the debunking argument can be neither too broad nor too narrow.

Consider the following passage:

> 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. (Fales, 1996, p. 443)

Because there is no way to guarantee pragmatically successful outcomes given false beliefs, evolution is likely to guarantee that global belief-forming mechanisms, extending across many domains, are generally reliable. Consequently, if a debunking argument takes aim at a global belief-forming mechanism, the argument is likely to fail; evolution would ensure such a belief-forming mechanism is reliable. A narrower skeptical conclusion can avoid this result. If, however, the skeptical conclusion is too narrow, it will fail to threaten scientific realism; e.g., the Gambler's fallacy does little to threaten scientific realism.

De Ray's Debunking Argument

De Ray's debunking argument targets inference to the best explanation (henceforth, 'IBE'), which is widely agreed to be the primary vehicle by which we gain evidence for scientific theories (Boyd, 1981, 1984; Lipton, 1991, 2004; Psillos, 1999). In order for IBE to be a reliable method of reasoning, 'facts [must] generally have explanations for their obtaining' (de Ray, 2020, p. 4). If they do not, then for any given fact and corresponding best explanation, it is likely that the explanation is false. IBE would, concomitantly, lead us to form largely false beliefs.

According to de Ray, the claim that *facts generally have explanations for their obtaining* is a metaphysical intuition. Furthermore, because the survival value of true metaphysical intuitions is questionable, de Ray holds that 'given evolutionary theory, the… [truth] of our innate metaphysical intuitions would not at all explain our reliance on said intuitions' (de Ray, 2020, p. 5) and we should thus doubt our metaphysical intuitions. Since IBE relies on the truth of the claim that *facts generally have explanations for their obtaining* and IBE is the primary vehicle by which we gain evidence for scientific theories, it appears to follow that we should be skeptical of all of our scientific theories, evolution included.

De Ray Violates Both Constraints

The skeptical challenge presented by de Ray's argument is too narrow to present a threat to scientific realism. Grant de Ray's central claims are as follows: (i) evolutionary theory ought to make us distrust our innate metaphysical intuitions and (ii) we have a metaphysical intuition with the content *facts generally have explanations*

for their obtaining. These two claims combine to undermine our metaphysical intuition that *facts generally have explanations for their obtaining*. However, beliefs can have more than one source of justification. If some other source of justification is available for the claim that *facts generally have explanations for their obtaining*, the belief may weather the debunking storm.

Consider any number of obtaining facts: the glass broke, Mikaela's tree fell over, decreasing a gas's density increases its temperature, and trees' leaves change colors in the fall. In all of these cases—and many, many more—the obtaining fact has an explanation. We can now reason as follows: the overwhelming majority of obtaining facts we have encountered have an explanation; therefore, facts generally have explanations for their obtaining. Even if de Ray successfully debunks the metaphysical intuition that *facts generally have explanations for their obtaining*, the belief remains in good standing via inductive justification.

One may, however, wonder how we can be confident that each of the above has an explanation. There are a variety of (compatible) answers. One answer is that each of the above has some best explanation and that IBE allows us to conclude that the best explanation is also true. Another answer is that the relevant explanations have been pragmatically successful, which, in turn, via IBE, offers evidence of their truth.

As de Ray notes, this seems circular. The inductive justification of our belief that *facts generally have explanations for their obtaining* relies on IBE. But now, the defense of IBE rests on the reliability of IBE. This appears viciously circular.

This rejoinder likely falls flat when contextualized within the broader dialectic. The most influential threads of scientific realism aim to defend IBE via IBE (Boyd, 1981, 1984; Douven, 2017). There may be good reasons to be concerned that this approach is viciously circular (Laudan, 1981; Fine, 1984). Nonetheless, de Ray's debunking argument is defanged. The argument is only successful if, for independent reasons, one of the dominant forms of scientific realism is viciously circular.

There are substantive philosophical issues at play here. It is thus worth emphasizing the larger point. As Douven (2017, 3.2) notes: '[A] priori defenses of abduction seem out of the question. Indeed, all defenses that have been given so far are of an empirical nature…' De Ray's debunking argument rests on the claim that *IBE relies on a metaphysical intuition*. This is, however, not a claim that any scientific realist is likely to accept. De Ray's debunking argument is thus too narrow to successfully impugn contemporary defenses of scientific realism.

But, suppose that IBE relies on the aforementioned metaphysical intuition after all. It nonetheless remains unlikely that his argument succeeds. Recall that de Ray calls into doubt the metaphysical intuition that *facts generally have explanations for their obtaining*. This 'intuition' is a lynchpin of IBE generally. IBE is ubiquitous in everyday reasoning. Since there is no reliable way to move from false beliefs to pragmatically successful behavior, ubiquitous false beliefs pose a significant challenge to evolutionary fitness. It is thus highly unlikely that IBE is unreliable; if it was, it would have been weeded out by natural selection. And if it is highly unlikely that IBE is unreliable, it follows that the claim that *facts generally have explanations for their obtaining* is true.

Consider 'Lucky Accident,' the principle underlying de Ray's argument:

> If you believe that the origins of the belief forming method M on which you rely for some of your beliefs are such that the reliability of M would not at all explain your reliance on M, your continued reliance on M is unjustified.

But of course, IBE's reliability *does* explain why we rely on it. If IBEs were not reliable, neither our ancestors who used it nor the cognitive systems that implement it would have survived the process of natural selection. The reliability of IBE is thus integral to any explanation of why we rely on it. There is no Lucky Accident after all.

Looking Forward

De Ray's argument runs afoul of the dual constraints for evolutionary debunking arguments. If the skeptical conclusion of the argument is too narrow, it fails to undermine scientific realism; too broad, the major premise can be falsified by dictates of evolutionary theory. The failure of de Ray's debunking argument illustrates the challenge of successfully threading the needle. The evolutionary debunking of scientific realism requires perfectly tailoring the scope of one's skeptical conclusion.

By contrast, Graber and Golemon's argument, even when extended to all of the super-empirical virtues, appears to avoid both horns of the dilemma. Consider their defense of their original debunking argument. First, they argue that their skeptical challenge is not too narrow. If simplicity plays a pivotal role in theory selection, the evolutionary debunking of simplicity would pose a significant challenge to scientific realism. This defense similarly covers the version of their debunking argument that targets all of the super-empirical virtues, as they all play a key role in theory selection.

Furthermore, Graber and Golemon argue that their skeptical challenge is not overly broad. Cognitive limitations may make simpler folk psychological explanations more likely to be true. Given that folk psychology helps us predict the behavior of humans and non-human animals, our preference for simplicity can thus be vindicated as truth-conducive in an enormous range of contexts. Their skeptical challenge thus does not entail that we find ourselves with ubiquitous false beliefs. At the same time, it would be miraculous if a method of theory selection developed in the unique context of folk psychology turned out to be reliable in physics or biology.

This strategy can be applied to the extended version of their argument. Scientific realists generally hold that the super-empirical virtues are reliable independent of the domain of (empirical) inquiry. *A fortiori*, the super-empirical virtues are reliable when used in folk psychology. The scientific realist's commitment to the reliability of the super-empirical virtues in folk psychology can ground an etiological story whereby IBE is broadly reliable.

This reliability must, however, be grounded in some fact(s) about folk psychology. It would thus be miraculous if methods of theory selection adopted because they were reliable in the domain of folk psychology somehow turned out to be reliable in particle physics, quantum chemistry, etc. Consequently, the skeptical implications for scientific realism remain intact.

An anonymous reviewer noted that de Ray may also be able to use this exact strategy for avoiding the charge of being overly broad. At best, this would allow him to avoid only one horn of the dilemma. Moreover, there are disanalogies that work against de Ray. The super-empirical virtues never decide between hypotheses on the basis of empirical evidence[1]; IBE does. Because they only attack the super-empirical virtues, Graber and Golemon can allow for the general reliability of IBE as it involves empirical evidence. By contrast, de Ray must hold that *any* use of IBE beyond folk psychology is irredeemably unreliable, even as it regards empirical considerations. As before, the implications for evolutionary fitness likely preclude IBE being unreliable with regard to selecting between hypotheses on even purely *empirical* grounds.

Conclusion

Graber and Golemon's extended debunking argument appears not only to withstand the challenge pushed by de Ray but further appears to successfully navigate the constraints on evolutionary debunking. As our analysis of de Ray's argument indicates, this latter task is no easy feat. The skeptical target for the evolutionary debunking of naturalism is small indeed. If Graber and Golemon's (extended) evolutionary debunking argument is not successful, it is unclear how much hope one should hold out for other attempts.

References

Boyd, R. (1981). Scientific realism and naturalistic epistemology. In P. Asquith & R. Giere (Eds.), *PSA 1980.* (Vol. II, pp. 613–662). Philosophy of Science Association.

Boyd, R. (1984). The current status of scientific realism. In J. Leplin (Ed.), *Scientific realism.* (pp. 41–82). University of California Press.

de Ray, C. (2020). An evolutionary sceptical challenge to scientific realism. *Erkenntnis* 1–21. https://doi.org/10.1007/s10670-020-00226-3.

Douven, I. (2017). Abduction. In: *The Stanford encyclopedia of philosophy*, ed. by Edward Zalta. The Metaphysics Research Lab. https://plato.stanford.edu/entries/abduction/. Accessed 26 March 2021.

Fales, E. (1996). Plantinga's case against naturalistic epistemology. *Philosophy of Science, 63*, 432–451

Fine, A. (1984). The natural ontological attitude. In J. Leplin (Ed.), *Scientific realism.* (pp. 83–107). University of California Press.

Graber, Abraham, and Luke Golemon. 2019. Plantinga Redux: Is the scientific realist committed to the rejection of naturalism? *Sophia* 1–18. https://doi.org/10.1007/s11841-018-0695-0.

Laudan, L. (1981). A confutation of convergent realism. *Philosophy of Science, 48*(1), 19–49.

Lipton, P. (1991). *Inference to the best explanation*. Routledge.

Lipton, P. (2004). *Inference to the best explanation*. (2nd ed.). Routledge.

Psillos, S. (1999). *Scientific realism: how science tracks truth*. Routledge.

---

[1] Hence, their *super*empirical nature.