

VAN FRAASSEN'S BEST OF A BAD LOT OBJECTION, IBE AND RATIONALITY

MICHAEL SHAFFER

ABSTRACT

Van Fraassen's (1989) infamous best of a bad lot objection is widely taken to be the most serious problem that afflicts theories of inference to the best explanation (IBE), for it alleges to show that we should not accept the conclusion of any case of such reasoning as it actually proceeds. Moreover, this is supposed to be the case irrespective of the details of the particular criteria used to select best explanations. The best of a bad lot objection is predicated on, and really only requires, the idea that in any real case of IBE where one hypothesis is favored as best over those with which it competes, it is always the case that it is more likely that the true explanation is to be found in the set of unformulated and unconsidered logical alternatives to the set of actually considered hypotheses. On this basis, Van Fraassen believes that accepting the conclusion of IBEs so understood is irrational and this is simply because such inferences are supposedly not probative. In this paper the best of a bad lot objection will be addressed and it will be shown that Van Fraassen's notorious criticism of IBE depends on a problematic conflation of two notions of rationality and thus that his criticism of IBE involves a damning equivocation. In essence, he conflates ideal standards of rationality with epistemic standards of rationality and, in so doing, makes it appear to be the case that we should not accept the conclusions of IBEs. But, when we disambiguate the concepts of rationality at work in the argument Van Fraassen's conclusion simply does not follow.

Keywords: constructive empiricism, inference to the best explanation, best of a bad lot objection, explanation, rationality, inference

1. Introduction

van Fraassen's (1989) infamous best of a bad lot objection is widely taken to be the most serious problem that afflicts theories of inference to the best explanation (IBE), for it alleges to show that we should not accept the conclusion of any case of such reasoning as it actually proceeds.¹ Moreover, this is supposed to be the case irrespective of the details of the particular criteria used to select best explanations.² The best of a bad lot objection

¹ See Wray 2006 in particular on this point.

² See, for example, Chakravartty 2017, Khalifa 2010, Wray 2006, 2007 and 2008 and Psillos 1996 and 1999.

is predicated on, and really only requires, the idea that in any real case of IBE where one hypothesis is favored as best over those with which it competes, it is always the case that it is more likely that the true explanation is to be found in the set of unformulated and unconsidered logical alternatives to the set of actually considered hypotheses. On this basis, van Fraassen believes that accepting the conclusions of IBEs so understood is irrational and this is simply because such inferences are supposedly not probative. In this paper the best of a bad lot objection will be addressed, and it will be shown that van Fraassen's notorious criticism of IBE depends on a problematic conflation of two notions of rationality. Thus, it will be argued that his criticism of IBE involves a damning equivocation that has been systematically overlooked. In essence, he conflates ideal standards of rationality with epistemic standards of rationality and, in so doing, makes it appear to be the case that we should not accept the conclusions of IBEs. But, when we disambiguate the concepts of rationality at work in the argument van Fraassen's conclusion simply does not follow. This is ultimately important because the best of a bad lot objection is a central part of van Fraassen's (1980, 1989) defense of constructive empiricism against the orthodox forms of scientific realism.³

2. The Best of a Bad Lot Objection and IBE

Where $T_i \in \{T_m\}$, IBE takes the following canonical form:

Data $\{E_n\}$ has been observed.

The set of theories $\{T_m\}$ individually explain $\{E_n\}$.

T_i is the best explanation of $\{E_n\}$ among the members of $\{T_m\}$.

So, it is likely that T_i .⁴

A full theory of IBE then must specify criteria by which the bestness of explanations is to be established and such that bestness of explanation provide rational grounds for the acceptance of best hypotheses. The details of such an account do not matter here. All that is required for the criticism of van Fraassen's best of a bad lot objection levelled here is that we assume that there exists some such criteria and this assumption is really just an acknowledgement of the wide scope of his criticism of IBE. The best of a bad lot objection implicates *all* accounts of IBE, no matter which specific selection criteria are being deployed. We can also simply assume for the purposes of this paper that we are dealing with "rational IBEs" only, i.e. IBEs that satisfy the IBE criteria whatever they turn out to be. This assumption

³ See Leplin 1984, Psillos 1999, Chakravartty 2017 and Monton and Mohler 2021.

⁴ Alternatively, the conclusion might simply be "accept T_i ". See Lipton 2004 and McMullin 1992 on IBE.

then rules out cases of erroneous IBE reasoning as relevant here. This is important because van Fraassen's criticism is that even in cases where IBE reasoning perfectly follows the canons of IBE, the conclusions of IBEs are not likely to be true and should not be rationally accepted.

Given these caveats, van Fraassen's best of a bad lot (BBL) argument can then be rather straightforwardly stated as follows:

P1: In rational IBEs it is always more likely that the true hypothesis is to be found in the set of unformulated and unconsidered hypotheses.

P2: If in rational IBEs it is always more likely that the true hypothesis is to be found in the set of unformulated and unconsidered hypotheses, then it is irrational to accept the conclusion of any actual IBE.

∴ It is irrational to accept the conclusion of any actual IBE.

This problem arises in virtue of the following line of thought. In cases of rational IBE, the reasoner is supposed to accept the best explanation from among the competing theories that explain the data. Let us then suppose that this is the case and the principles of IBE that guide the selection of the best hypothesis are followed. The problem with such reasoning, according to van Fraassen, is that even the case of rational IBEs actual reasoners can only ever consider a finite set of formulated and known hypotheses. From a purely logical point of view and as a consequence of the underdetermination of theory by the evidence, there are always an infinite (or perhaps just very large) set of logically possible hypotheses that explain any given body of data. So, in actual cases of IBE the reasoner only ever canvases a tiny portion of that space of possible explanations of the given body of data. Thus, it appears to be the case that, for purely logical reasons, it will virtually always be true that it is more likely that the true explanation of that data is to be found in the vast set of unconsidered and/or unformulated hypotheses that potentially explain the data under consideration. van Fraassen explicitly lays out this line of thinking in reference to the contention that IBE is a rule by which new beliefs are supposed to be warranted on the basis of evidence as follows:

It cannot be *that* for it is a rule that only selects the best among the historically given hypotheses. We can watch no contest of the theories we have so painfully struggled to formulate, with those no one has proposed. So our selection may be the best of a bad lot. To believe is *at least* to consider more likely to be true, than not. So to believe the best explanation requires more than an evaluation of the given hypothesis. It requires a step beyond the comparative judgment that hypothesis is better than its actual rivals (1989, 143).

On this basis he further tells us about IBE that,

This rule cannot supply the initial context of belief or opinion within which alone it can become applicable. Therefore it cannot be what 'grounds' rational opinion (1989, 149).

Again, notice that this criticism holds independently of any particular IBE selection criteria and Van Fraassen argues that IBE is not such that it provides rational grounds for theory acceptance.

When one looks carefully at the argument, however, it is clear that there is a problem. Specifically, the notion of rationality at work in the argument is largely unspecified and it becomes clear upon closer inspection that the failure to be more specific makes the argument appear rather more compelling than it in fact is. What this analysis reveals is an important equivocation involved in the argument. In order to see this let us begin by noting that there are two important senses of rationality at work here. The first is the idea of broadly logical or ideal rationality and the second is the idea of epistemic rationality.⁵ These are not the same concepts, although they are, of course, related. More crucially, here we will consider these concepts only as they apply to IBE. So, for the purposes of this paper let us suppose that an epistemic agent is ideally rational in the relevant sense just in case that agent possesses perfect competence with respect to the set of principles of reasoning R_I that govern IBE and a base of knowledge K_I that includes knowledge of all logical possible theories that potentially explain the known data. Let us also suppose that an epistemic agent is epistemically rational just in case that agent possesses competence with respect to the set of principles of reasoning R_I that govern IBE and a base of knowledge K_E that includes knowledge of only a sub-set of the set of logical possible theories that potentially explain the known data. More specifically K_E contains only actually formulated explanations. Notice, that, so defined, both senses of rationality assume perfect competence with respect to the principles of reasoning governing IBE and that they differ only in terms of the completeness of the knowledge base of explanatory hypotheses.⁶ Now, given this important distinction the BBL argument can be interpreted consistently in the following two very different ways. First:

P1: In *ideally* rational IBEs it is always more likely that the true hypothesis is to be found in the set of unformulated and unconsidered hypotheses.

P2: If in *ideally* rational IBEs it is always more likely that the true hypothesis is to be found in the set of unformulated and unconsidered hypotheses, then it is *ideally* irrational to accept the conclusion of any *ideally* rational IBE.

∴ It is *ideally* irrational to accept the conclusion of any *ideally* rational IBE.

⁵ These ideas are broadly related to the familiar ideas of epistemic and logical possibility. A claim is logically possible just in case it is non-contradictory and a claim is epistemically possible just in case it is compatible with what an agent knows. This distinction is also closely related to the distinction between ideal and non-ideal rationality, as, for example, Cherniak 1986 makes it.

⁶ This sort of distinction is importantly related to the ideas of a logically complete sample space composed of all logical possibilities and an epistemically realistic sample space composed of known hypotheses that explain some known body of data. So, it is by no means unusual.

Let us call this the BBL_I argument. But, the problem here is that in order to capture the insight that grounds van Fraassen's best of a bad lot objection (i.e. the contention that the true hypotheses is likely in the set of unformulated but logically possible explanatory hypotheses) one cannot interpret BBL exclusively in terms of ideal rationality as per BBL_I . This is because on that interpretation it is clear that P1 would be false. In cases of ideal reasoning $\{T_m\}$ includes all logically possible hypotheses. Alternatively, the BBL argument can be understood as follows:

P1: In *epistemically* rational IBEs it is always more likely that the true hypothesis is to be found in the set of unformulated and unconsidered hypotheses.

P2: If in *epistemically* rational IBEs it is always more likely that the true hypothesis is to be found in the set of unformulated and unconsidered hypotheses, then it is *epistemically* irrational to accept the conclusion of any *epistemically* rational IBE.

∴ It is *epistemically* irrational to accept the conclusion of any *epistemically* rational IBE.

Let us call this the BBL_E argument. But, there is a problem here too. While shifting from ideal rationality to epistemic rationality fixes the problem with BBL_I and P1, in BBL_E the consistent use of epistemic rationality renders P2 false. It is not epistemically irrational to infer as *likely* the conclusions of rational IBEs made on the basis of sets of actually formulated hypotheses.

So, more needs to be said about which concept of rationality is intended to be at work in the BBL argument and whether it can be made to be sound. Most importantly, it should be clear that it does not follow that it is epistemically irrational to accept the conclusion of an argument from the claim that it is ideally irrational to accept it, at least not without further argument. So, minding the distinction between epistemic and ideal rationality is important. Once this distinction is recognized, however, it becomes clear that van Fraassen has made a crucial mistake in conflating these two different concepts and that to make the best of a bad lot objection stick he would have to endorse a version of the BBL argument that is distinct from both the BBL_I and BBL_E arguments and which is *invalid*. In fact, van Fraassen appears to be endorsing the following deeply problematic version of the BBL argument:

P1: In *epistemically* rational IBEs it is always more likely that the true hypothesis is to be found in the set of unformulated and unconsidered hypotheses.

P2: If in *epistemically* rational IBEs it is always more likely that the true hypothesis is to be found in the set of unformulated and unconsidered hypotheses, then it is *ideally* irrational to accept the conclusion of any *epistemically* rational IBE.

∴ It is *epistemically* irrational to accept the conclusion of any *epistemically* rational IBE.

This is the mixed BBL argument, BBL_M . By employing both concepts of rationality variously in the argument it looks like one can get P1 and P2 to be true. But, this argument is clearly invalid and it makes manifest the problematic equivocation concerning the concept of rationality at work in the BBL argument that makes explicit the best of a bad lot objection. Now, one might attempt to dodge this problem by weakening the conclusion as follows: it is *ideally* irrational to accept the conclusion of any *epistemically* rational IBE. But, this essentially destroys the critical force of van Fraassen's best of a bad lot objection for then it would only support the virtually trivial point that the conclusions of epistemically rational IBEs are provisional pending one's becoming aware of new explanatory hypotheses. But, being a species of non-monotonic and inductive inference, no one doubts the provisional nature of such inferences. Such reasoning is then rational in the epistemic sense and it perfectly reasonable to accept the conclusions of good IBEs because they involve good reasoning that selects the best explanation from among the actually formulated alternative explanations. So, the conclusions of such inferences are rational in virtue of the fact that they are the most likely of the currently formulated alternatives, even if they are not the objectively most likely hypotheses.⁷

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⁷ See Shaffer 2019 for a positive defense of IBE so understood and which arises out of this criticism of van Fraassen's argument.

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Michael J. SHAFFER
Department of Philosophy
Gustavus Adolphus College
OM 104
800 West College Avenue
Saint Peter, MN 56082, USA
ShafferMJ66@outlook.com