

Constructive Empiricism in a Social World: Reply to Richard Healey

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Abstract

Constructive empiricism implies that if van Fraassen does not believe that scientific theories and his positive philosophical theories, including his contextual theory of explanation, are empirically adequate, he cannot *accept* them, and hence he cannot use them for scientific and philosophical purposes. Moreover, his epistemic colleagues, who embrace epistemic reciprocalism, would not believe that his positive philosophical theories are empirically adequate. This epistemic disadvantage comes with practical disadvantages in a social world.

Keywords: Constructive Empiricism, Contextual Theory, Epistemic Reciprocalism

Introduction

Bas van Fraassen (2017) argues that we are rational to believe and disbelieve T,¹ a scientific theory that best explains phenomena, relying on the English view of rationality. In addition, he thinks that the belief of T is supererogatory. As a result, he disbelieves T. Park (2019b) objects that van Fraassen's disbelief of T backfires on his (1980) contextual theory of explanation and on the empiricist position that T is empirically adequate, appealing to *epistemic reciprocalism* according to which "we ought to treat our epistemic colleagues, as they treat their epistemic colleagues" (Park 2017, 57).

Richard Healey (2019) objects that van Fraassen believes neither that the contextual theory is true, nor that T is empirically adequate, and so my criticisms against van Fraassen's position misfire. This paper responds to Healey's defense of van Fraassen's position from my criticisms. I unfold the epistemic and practical disadvantages of disbelieving that T and van Fraassen's positive philosophical theories are empirically adequate. This paper will be a reminder that we are social epistemic agents.

The Contextual Theory

Park (2019b) objects that epistemic reciprocalists, invoking the English view of rationality, would argue that we are rational to believe and disbelieve the contextual theory, and that van Fraassen ought to disbelieve the contextual theory just as he disbelieves T. In addition, epistemic reciprocalists would disbelieve the contextual theory on the grounds that it is superfluous to believe it. This epistemic disadvantage comes with practical disadvantages.

¹ Park (2019a) criticizes in detail van Fraassen's view that we are rational to believe and disbelieve T. This paper, however, assumes that van Fraassen's view is correct.

Imagine, for example, that van Fraassen thinks that the contextual theory is great, so he applies for a scholarly award for it. The award committee, embracing epistemic reciprocalism, rejects his application on the grounds that they disbelieve the contextual theory. In addition to such a practical disadvantage, there are other practical disadvantages of disbelieving T, as Park (2018, 2019c) discusses in detail, but I do not invoke them in this paper due to space concerns.

How does Healey defend van Fraassen's position from my foregoing criticisms against van Fraassen's position? Healey argues that van Fraassen is not committed to the truth of the contextual theory. His first argument for this interpretation of van Fraassen's position goes as follows. According to van Fraassen, a theory is a collection of models, and models are abstract entities, so he would say that the contextual theory is a collection of abstract entities. He cannot believe the contextual theory, "for that would involve believing in the existence of all the unobservable *abstracta* that feature in the relevant models" (Healey 2019, 26).

This interpretation presupposes that van Fraassen cannot believe that abstract entities are real because he does not believe that T is true. The presupposition would be endorsed by many philosophers of mathematics, such as Willard Quine (1948), Hilary Putnam (1971), and Alan Baker (2012). On these philosophers' account, the confirmation of T is a means to arrive at the belief that the mathematical constituents of T are true, and hence some mathematical entities exist in the abstract world. For them, it follows that if van Fraassen disbelieves T, he cannot believe that mathematical entities are real. Let me add that if it is gratuitous to believe in the existence of concrete entities, such as neutrinos and dark matter, it is *a fortiori* gratuitous to believe in the existence of abstract entities, such as models and triangles. After all, T is about concrete entities. Concrete entities are causally connected with human brains, whereas abstract entities are not. So abstract entities are epistemically more remote from us than concrete entities are.

Let me now turn to Healey's contention that since van Fraassen believes that a theory is a set of models, he cannot believe the contextual theory. We can draw a more skeptical conclusion: van Fraassen cannot even believe that *some* observational consequences of the contextual theory or T are true. Thus, he can believe none of what the contextual theory about science and none of what T says about the world because he believes that the contextual theory and T are collections of models. It seems to me that the only way for him to avoid this extremely skeptical position is to withdraw his view that a theory is a collection of models.

Let me now turn to Healey's next argument for his interpretation of van Fraassen's position that van Fraassen does not believe the contextual theory. According to Healey, van Fraassen never says that he believes that the contextual theory is true, but van Fraassen says that the contextual theory is "basically correct" (van Fraassen 1980, 146). Healey adds that van Fraassen's phrase, 'basically correct,' can be charitably interpreted as *acceptable*:

While Van Fraassen never says that he believes his own theory is true, he does say that he believes it is "basically correct" (146). Even an unsympathetic reader who does not distinguish between 'correct' and 'true' here must acknowledge a gap between 'correct' and 'basically correct'. A more sympathetic reader would rather identify 'correct' with 'acceptable' and take Van Fraassen here to be stating his belief that, while not acceptable as it stands, some development of (CT) will be acceptable. (Healey 2019, 26)

How do I respond to this interpretation of van Fraassen's position? Let me point out that in another place, van Fraassen says that the contextual theory is not just basically correct but correct *simpliciter*:

To be successful, a theory of explanation must accommodate, and account for, both rejections

and asymmetries. I shall now examine some attempts to come to terms with these, and gather from them the clues to the correct account. (van Fraassen 1980, 112)

Let me add that in other places, van Fraassen talks as if he believes the contextual theory. For example, he states, “An explanation is an answer to a why-question” (van Fraassen 1980, 134), and “among the scientifically relevant factors, context determines explanatorily relevant ones” (van Fraassen 1980, 126). It seems to me that he cannot say such sentences without believing the contextual theory, and that if he does not believe it, his sentences mislead his readers into thinking that he believes it.

I, however, set aside this interpretational issue. I am happy to go along with Healey’s interpretation of van Fraassen’s position. Now, Healey contends that since van Fraassen is not committed to the truth of the contextual theory, my criticism against van Fraassen’s position misfires:

I have shown that Van Fraassen can happily admit that he does not believe that (CT) is true, while consistently maintaining that it is basically correct. Does this leave Van Fraassen in a disastrous position? I don’t see that it does. If I were Van Fraassen I would consider Seungbae’s attack on my contextual theory of explanation successfully repulsed. Turning his own voluntarist epistemology against him has not dislodged him from that position. (Healey 2019, 27)

To say, however, that van Fraassen does not believe the contextual theory means that he would have to bite the bullet, enduring all the aforementioned epistemic and practical disadvantages of not believing the contextual theory. It is not clear what would motivate him to endure them. In general, we endure certain disadvantages of a position when there are overriding advantages to it. I see, however, only one advantage of van Fraassen’s position, viz., having no chance to have a false belief about the contextual theory. I do not see any additional advantage to it.

The aforementioned bullet is a pretty big one. The size of the bullet can be gauged with the use of the following example. An introductory philosophy of science book (Hung 1996) has a chapter on scientific explanation. The chapter introduces rival theories of scientific explanation: the deductive-nomological theory, the causal theory, the contextual theory, and the unificatory theory. The chapter conveys the content of the contextual theory to readers, but it does not have the caveat: “Van Fraassen disbelieves the contextual theory.” Without the caveat, however, readers assume that he believes the contextual theory. In other words, conveying the content of the contextual theory without the caveat misleads readers into thinking that van Fraassen believes the contextual theory. Suppose that there are many introductory philosophy of science books in front of us, and that all of them have chapters on rivaling theories of explanation, including the contextual theory. We can say, “If we take in our hand any philosophy of science book, let us ask, ‘Does it have the caveat that van Fraassen disbelieves the contextual theory?’ No. Commit it then to the flames, for it misleads readers.”²

I suspect that instructors of introductory philosophy of science courses do not announce to their students in classrooms that van Fraassen disbelieves the contextual theory

² This sentence is intended to echo David Hume’s famous passage: “If we take in our hand any volume—of divinity or school metaphysics, for instance—let us ask, *Does it contain any abstract reasoning concerning quantity or number?* No. *Does it contain any experimental reasoning concerning matter of fact and existence?* No. Commit it then to the flames, for it can contain nothing but sophistry and illusion” (Hume 1748/1955, 1173).

when they introduce the rival theories of scientific explanation, including the contextual theory. I suppose that if they do, many of their students would feel less motivated to make efforts to understand the contextual theory, and that even if they understood it with little effort, they would find it less convincing. In general, you are a leader with respect to your positive theory, whatever it is. If you declare that you disbelieve it, others are not likely to believe it (Park 2019c, Section 4).

Imagine that van Fraassen says, “I disbelieve my contextual theory. I don’t care whether philosophy of science books have the caveat or not. I don’t care either whether instructors of introductory philosophy of science courses announce the caveat to students or not.” How would epistemic reciprocalists respond to the disinterested philosopher? They would have nothing to say to him except, “OK. As you wish. I happily disbelieve your theory. I’ll put the caveat in my manuscript and announce the caveat to my students in my course. Have a great day.” In sum, the rivaling interlocutors would go their own ways.

The Empiricist Position

I stated that “van Fraassen (1985, 294) chooses the belief that T is empirically adequate” (2019b, 92). Healey retorts that van Fraassen (1985, 294) criticizes scientific realism without committing to the empiricist position that T is empirically adequate, and that it is wrong for me to attribute the position to van Fraassen:

Who occupies this “empiricist position”? Since Park’s paper is directed against Van Fraassen he apparently takes this to be Van Fraassen’s position. But it is not. (CE) does not imply that a theory that best explains some data is (merely) empirically adequate. Since it is not an epistemological position, neither does (CE) imply that a scientist should believe that such a theory is (merely) empirically adequate. (Healey 2019, 27)

It is a tricky issue whether van Fraassen is committed to the empiricist position or not. In the literature, some writers attribute the position to him, while other writers accuse them of misinterpreting constructive empiricism. For example, Mario Alai says that according to constructive empiricism, “all we need to believe is that a theory is empirically adequate” (Alai 2017, 21). Stathis Psillos (1997) argues that it takes an epistemic privilege to believe in the empirical adequacy of T. K. Brad Wray objects that “the constructive empiricist is not committed to claiming that our best theories are in fact empirically adequate” (Wray 2012, 378). Healey has just joined Wray’s camp, which is fair enough.

Wray and Healey’s interpretation of constructive empiricism is not without grounds. Constructive empiricism holds that “*Science aims to give us theories which are empirically adequate,*” and “*acceptance of a theory involves as belief only that it is empirically adequate*” (van Fraassen 1980, 12). Constructive empiricism, thus defined, is a thesis about what science aims for and what belief acceptance of T involves.³ It is not a thesis about whether T is empirically adequate or not. Hence, it appears that Wray and Healey are right to say that van Fraassen is not committed to the empiricist position.

To say so, however, entails that van Fraassen cannot accept T. After all, the definition of constructive empiricism implies that if van Fraassen were a constructive empiricist and accepts T, he would believe in the empirical adequacy of it, and that if he accepts T and yet does not believe in the empirical adequacy of it, he is not a constructive empiricist. Now, if

³ To accept T is to commit to using it for scientific purposes, such as predicting and explaining. See Park (2018, 32–36; 2019c, Section 4) for the exposition and critical evaluation of van Fraassen’s notion of acceptance.

van Fraassen did not accept T, he could never use it to predict future events.⁴ As a result, he could not avail himself of the scientific knowledge about future events. The future events might include an earthquake that will occur in his place. This is the price that he would have to pay, according to constructive empiricism, for not believing in the empirical adequacy of T. Thus, to say that van Fraassen disbelieves in the empirical adequacy of T is to push him into this quagmire.

There is another quagmire. If van Fraassen does not believe in the empirical adequacy of T, he ought not to believe either that his positive philosophical theories, including the contextual theory, are empirically adequate. It follows that he ought not to accept them, which implies that he ought not to use them for philosophical purposes. For example, he ought not to use the contextual theory to account for puzzling phenomena in science, such as asymmetries and rejections, which he (1980, 111) claims that his theory can explain, but his rival theories cannot.

Moreover, scientific realists can play a similar game. Scientific realism holds that “*Science aims to give us, in its theories, a literally true story of what the world is like,*” and that “*acceptance of a scientific theory involves the belief that it is true*” (van Fraassen 1980, 8). Note that just like constructive empiricism, scientific realism is a thesis about what science aims for and what belief acceptance of T involves. It is not a thesis about whether T is true or not. It follows that just as constructive empiricists say, when attacked, that they disbelieve in the empirical adequacy of T, so scientific realists can say, when attacked, that they disbelieve in the truth of T. They might go further, saying that they even disbelieve in the empirical adequacy of T. For example, van Fraassen (1980, 39–40) explains the success of science not in terms of the truth of successful theories but rather in terms of the survival of successful theories. Scientific realists, as defined by van Fraassen, could reply that his attack misfires because scientific realism is not even committed to the empirical adequacy of successful theories, let alone to the truth of successful theories.

Van Fraassen claims that “there is also a positive argument for constructive empiricism—it makes better sense of science, and of scientific activity, than realism does and does so without inflationary metaphysics” (van Fraassen 1980, 73). In my view, this argument is simply a straw man fallacy. Scientific realism is not even committed to the empirical adequacy of T, to say nothing of inflationary metaphysics of T. Van Fraassen might reply that scientific realism asserts that T is true, so it is committed to inflationary metaphysics. This reply, however, gives rise to the burden of explicating why it is that his definition of scientific realism entails that T is true while his definition of constructive empiricism does not entail that T is empirically adequate. Recall that they are different views about what science aims for and what belief acceptance of T involves. They are not different views about whether T is true or empirically adequate.

Disbelief in the empirical adequacy of T comes with more severe epistemic and pragmatic disadvantages than disbelief in the truth of T. Van Fraassen’s epistemic colleagues, if they embrace epistemic reciprocalism, would even disbelieve that his positive philosophical theories are empirically adequate. This epistemic disadvantage is accompanied by practical disadvantages. Imagine again that van Fraassen thinks that the contextual theory is great, so he applies for a scholarly award. The award committee would reject his

⁴ He cannot *explain* events in terms of T even if he believes that T is empirically adequate. He should believe that T is true to explain events in terms of T (Park 2018). Thus, constructive empiricists who accept T cannot explain events in terms of T, although they may predict events with the use of T.

application on the grounds that they do not believe that the contextual theory is empirically adequate.

Imagine again that van Fraassen says, “I don’t believe my contextual theory is empirically adequate. I don’t care whether others believe or disbelieve it is empirically adequate.” How would epistemic reciprocalists respond to the disinterested philosopher? They would have nothing to say to him except, “OK. As you wish. I happily disbelieve your contextual theory is empirically adequate, so I happily reject your application for a scholarly award. Have a great day.” Again, the rivaling interlocutors would go their own ways.

Successful Empiricism

I defined skepticism as “the view that some observational consequences of T are true” (Park 2019b, 92). This definition is in line with Larry Laudan’s definition of success that T is successful if and only “if it passes a battery of standard tests” (Laudan 1981, 23). To say that T passes tests entails that some, but not all, observational consequences of T are true. This definition of success goes hand in hand with Musgrave’s contention that the inference from the success of T to the empirical adequacy of it is similar to the inference that “some crows are black because all crows are” (Musgrave 1988, 242). In any event, skepticism is so named because it does not make the ampliative inference from success to empirical adequacy. Park (2019b, Subsection 3.2) put forward skepticism as a skeptical alternative to constructive empiricism.

How does Healey respond to skepticism? He argues that constructive empiricism does not make the ampliative inference from success to empirical adequacy in the first place, so skepticism cannot be an alternative to constructive empiricism. To improve upon skepticism, he transforms it to what he calls *destructive empiricism*:

Destructive Empiricism (DE): Science aims to give us theories some of whose observational consequences are true: and acceptance of a theory involves as belief only that some of its observational consequences are true.” (Healey 2019, 28)

I am convinced that destructive empiricism improves upon skepticism, and that it is a foil for constructive empiricism. Destructive empiricists are gadflies to constructive empiricists, just as constructive empiricists are to scientific realists. Healey’s formulation of destructive empiricism is, as far as I am concerned, his most valuable contribution to the present debate over van Fraassen’s position.

Is destructive empiricism a viable alternative to constructive empiricism? Surprisingly, Healey answers, “No.” He rejects destructive empiricism on the grounds that it cannot explain scientific practice:

A practice best explained by (DE) would not be recognizable as science. Any theory deliberately constructed to accommodate any existing observational data would be immediately accepted just because it accommodated them. The burden of testing a theory would immediately be lifted and epistemic doubts about it reduced to doubts about the data it was constructed to accommodate. Such an activity fails the most basic condition that scientific activity involve ampliative inference. The epistemic economy of (DE) is illusory: while it minimizes the epistemic cost of accepting a theory, this confers no associated benefit. Destructive empiricism deserves its name. (Healey 2019, 28–29)

This criticism against destructive empiricism is beyond my comprehension. In my view, destructive empiricism does explain scientific practice. Consider the fact that many scientists apply successful theories to new parts of the world. For example, after using general

relativity to predict the bending of the light near a massive object, scientists used it to predict that gravitational waves would pass through the Earth. Scientists do this, according to destructive empiricists, because science aims for theories some of whose observational consequences are true and because scientists accept general relativity. Their acceptance involves the belief that some observational consequences of general relativity are true. According to constructive empiricists, by contrast, scientists do this because science aims for empirically adequate theories and because scientists accept general relativity. Their acceptance involves the belief that general relativity is empirically adequate.

When constructive empiricists and destructive empiricists give these rivaling explanations of scientific activity, they attribute different epistemic attitudes to scientists concerning their new predictions. According to constructive empiricists, scientists are sure that their new predictions are true. After all, constructive empiricists attribute to scientists the belief that all observational consequences of general relativity are true, and hence the belief that their new predictions are true. According to destructive empiricists, by contrast, scientists are not sure that their new predictions are true. After all, destructive empiricists attribute to scientists the belief that *some* observational consequences of general relativity are true, and hence the belief that their new predictions might be true or might be false.

To say that some observational consequences of T are true does not rule out the possibility that T can be used to make *true* predictions in new domains, so destructive empiricists do not ascribe to scientists the belief that T, which was successful in the old domains, will not be successful in the new domains. They rather ascribe to scientists the belief that T, which was successful in old domains, might be successful or might not be successful in new domains, thereby recognizing that ampliative inferences are operative in science.

Healey claims that “Since (DE) is a wildly unsuccessful theory it would be irrational for him (or anyone else) to accept it” (Healey 2019, 29). Contrary to what he contends, I believe that destructive empiricism explains scientific practice, as we have seen above, so it is a successful philosophical theory. Therefore, destructive empiricism does not deserve its name, and it deserves a better name: ‘successful empiricism.’

Conclusion

Healey (2019) argues that van Fraassen believes neither that the contextual theory is true, nor that T is empirically adequate. I replied that his interpretation of van Fraassen’s position is controversial. I, however, granted for the sake of argument that his interpretation is correct, and then exposed epistemic and pragmatic disadvantages of van Fraassen’s position thus interpreted.

Specifically, I argued that if van Fraassen disbelieves that T is empirically adequate, he ought to disbelieve that his positive philosophical theories, including the contextual theory, are empirically adequate, and hence he ought not to accept T and his positive philosophical theories, which implies that he ought not to use them for scientific and philosophical purposes. Moreover, his epistemic colleagues, embracing epistemic reciprocalism, will disbelieve that his positive philosophical theories are empirically adequate, and they would reject his application for a scholarly award on the grounds that they disbelieve that his positive philosophical theories are empirically adequate.

When van Fraassen’s position is under attack, his defenders typically say, “Van Fraassen didn’t say that,” “Van Fraassen doesn’t believe that,” “Van Fraassen doesn’t commit himself to that,” “You misrepresented van Fraassen’s position,” “You attacked the straw man,” and what have you. Admittedly, this defense strategy is effective in invalidating the criticisms from his critics, thereby bringing a victory to him. The victory, however, is a

Pyrrhic one. A skeptical position has epistemic and pragmatic price tags. The price tags are not negligible in a social world where cognitive agents interact with each other. My message to constructive empiricists is summarized in my previous slogan: “Believe me. I’ll believe you” (Park 2017, 64).

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