

# SURREALISM IS NOT AN ALTERNATIVE TO SCIENTIFIC REALISM

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**ABSTRACT:** Surrealism holds that observables behave as if T were true, whereas scientific realism holds that T is true. Surrealism and scientific realism give different explanations of why T is empirically adequate. According to surrealism, T is empirically adequate because observables behave as if it were true. According to scientific realism, T is empirically adequate because it is true. I argue that the surrealist explanation merely clarifies the concept of empirical adequacy, whereas the realist explanation makes an inductive inference about T. Therefore, the surrealist explanation is a conceptual one, whereas the realist explanation is an empirical one, and the former is not an alternative to the latter.

**KEYWORDS:** empirical adequacy, observables, scientific realism, surrealism, truth

## 1. Introduction

The term ‘surrealism’ refers to a philosophical position that is meant to be a surrogate for scientific realism.<sup>1</sup> This paper defines it as the view that observables behave as if T were true, and scientific realism as the view that T, a theory, is true. Surrealism is regarded as an alternative to scientific realism not only by Jarrett Leplin<sup>2</sup> but also by other eminent philosophers, such as Alan Musgrave,<sup>3</sup> P. Kyle Stanford,<sup>4</sup> Timothy Lyons,<sup>5</sup> and Moti Mizrahi.<sup>6</sup> This paper exposes a problem with

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<sup>1</sup> Jarrett Leplin, “Surrealism,” *Mind* 97, 384 (1987): 519–524.

<sup>2</sup> Leplin, “Surrealism.”

<sup>3</sup> Alan Musgrave, “The Ultimate Argument for Scientific Realism,” in *Relativism and Realism in Science*, ed. Robert Nola (Dordrecht: Kluwer Academic Publishers, 1988), 229–252; Alan Musgrave, “Strict Empiricism Versus Explanation in Science,” in *Varieties of Scientific Realism: Objectivity and Truth in Science*, ed. Evandro Agazzi (Switzerland: Springer International Publishing, 2017), 71–93.

<sup>4</sup> P. Kyle Stanford, “An Antirealist Explanation of the Success Science,” *Philosophy of Science* 67, 2 (2000): 266–284.

<sup>5</sup> Timothy Lyons, “Explaining the Success of a Scientific Theory,” *Philosophy of Science* 70, 5 (2003): 891–901.

<sup>6</sup> Moti Mizrahi, “Why the Ultimate Argument for Scientific Realism Ultimately Fails,” *Studies in History and Philosophy of Science Part A* 43, 1 (2012): 132–138.

surrealism, thereby presenting an important philosophical lesson – we should distinguish between two kinds of explanations: conceptual and empirical ones.

Philosophers have proposed surrealism as a way of explaining why T is successful and why T is empirically adequate. There are many differences between these two explananda. One of them is that the success of T implies that *some* observational consequences of T are true, whereas the empirical adequacy of T implies that *all* observational consequences of T are true. The history of science abounds in successful theories that were empirically inadequate.<sup>7</sup> For example, the Ptolemaic theory and the miasma theory were successful, but empirically inadequate. In addition to the truth of some observational consequences, T must meet other conditions to be successful, e.g., the auxiliary condition, the technological condition, and the financial condition. I only bring readers' attention to Park<sup>8</sup> for the explication of these other conditions.

This paper is concerned not with the surrealist explanation that T is successful because observables behave as if it were true, but with the surrealist explanation that T is empirically adequate because observables behave as if it were true. The former has already been criticized in detail.<sup>9</sup> Put briefly, scientists deserve credit for the success of T, but the surrealist explanation attributes the credit not to scientists but to the world, thereby disappointing scientists. To use an analogy, imagine that the Wright brothers worked hard to invent the airplane, but surrealists came along and said to the Wright brothers that the air plane could fly "because there was air in the sky."<sup>10</sup> Such an explanation would have failed to recognize the Wright brothers' accomplishment and would have disappointed them.

The outline of this paper is as follows. In Section 2, I appeal to the correspondence theory of truth to argue that saying that T is true is different from saying that the world is as T says it is. In Section 3, I argue that saying that T is empirically adequate is also different from saying that observables behave as if it were true. Hence, it is not a circular explanation that T is empirically adequate because observables behave as if it were true, contrary to what Musgrave<sup>11</sup> contends. In Section 4, I argue that the surrealist explanation is a trivial one for

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<sup>7</sup> Marc Lange, "Baseball, Pessimistic Inductions and the Turnover Fallacy," *Analysis* 62, 4 (2002): 282; Lyons, "Explaining the Success of a Scientific Theory," 898.

<sup>8</sup> Seungbae Park, "Realism Versus Surrealism," *Foundations of Science* 21, 4 (2016): 604–606.

<sup>9</sup> Park, "Realism Vs. Surrealism," 610–614.

<sup>10</sup> Park, "Realism Vs. Surrealism," 612.

<sup>11</sup> Musgrave, "The Ultimate Argument for Scientific Realism;" Musgrave, "Strict Empiricism Versus Explanation."

those who are already familiar with the concept of empirical adequacy. In addition, I distinguish between conceptual and empirical explanations, classifying the surrealist explanation as conceptual and the realist explanation as empirical. In Section 5, I reply to two objections. This paper can be useful to those who are interested in whether surrealism is an alternative to realism, under what conditions an explanation is appropriate, and how conceptual explanations differ from empirical ones.

## 2. The Correspondence Theory of Truth

If you ask correspondentists, theorists who espouse the correspondence theory of truth, to explain why T is true, they will put forward the correspondentist explanation that T is true because it corresponds to the world, i.e., because the world is as T says it is. The correspondentist explanation is composed of the following two statements:

(T) T is true.

(W) The world is as T says it is.

Are (T) and (W) substantially different assertions? Or are they merely different expressions of the same assertion? In my view, they are substantially different assertions. (T) is an assertion about T, whereas (W) is an assertion about the world. (T) attributes a semantic property to T, whereas (W) attributes a certain manner of existence to the world. (T) and (W) cannot be mere verbal variants because they are different assertions about different targets.

If (T) and (W) were mere verbal variants, the correspondence theory would be a vacuous theory of truth. The correspondence theory, however, is not a vacuous theory of truth. It rather makes a substantive claim about what makes a statement true, viz., the world is what makes a statement true. Unlike other theories of truth, it claims that the world serves as the truth-maker for true statements.<sup>12</sup> Of course, if correspondentists believe (T), they can infer (W), and vice versa. After all, that is what it means to embrace the correspondence theory. It does not follow, however, that (W) is merely a verbal variant of (T). It is one thing that we can infer (W) from (T) and vice versa; it is another that they are mere verbal variants.

When correspondentists propose that T is true if and only if the world is as T says it is, they are engaged in a conceptual analysis of the concept of truth. They aim to identify the necessary and sufficient conditions for the truth of T. To this

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<sup>12</sup> Alvin Goldman, *Knowledge in a Social World* (Oxford: Oxford University Press, 1999), 61.

end, they claim that if the world were not as T says it is, T would not be true, i.e., that correspondence to the world is a necessary condition for the truth of T. They also claim that if the world were as T says it is, T would be true, i.e., that correspondence to the world is a sufficient condition for the truth of T. A conceptual analysis is not an *a posteriori* enterprise but an *a priori* enterprise. While an *a posteriori* enterprise involves an investigation into the world, an *a priori* enterprise does not. Correspondentists are not making any inductive inferences about the world, but are laying bare the concept of truth.

Consider the proposal that the special theory of relativity is true because the world is as it says it is. Does this proposal merely repeat the same assertion? Or does it say something interesting about why the special theory of relativity is true? If you think that (W) is just a fancy way of saying (T), you would immediately think that it is vacuous to say that the special theory of relativity is true because the world is as it says it is. By contrast, if you think that (T) and (W) are substantially different assertions, you would think that the proposal says something interesting about why the special theory of relativity is true. (T) and (W) are substantially different assertions, as we have seen above. Therefore, it is not circular to say that the special theory of relativity is true because the world is as it says it is.

This conclusion will serve as a theoretical resource for me to refute Musgrave's objection to surrealism in the next section.

### 3. The Refutation of Musgrave's View

What does it mean to say that observables behave as if T were true? It means "that observable events occur as T says they do."<sup>13</sup> What about unobservable events? They may or may not occur as T says they do, i.e., it is open to question whether unobservables behave or do not behave as T says they do. T would be true if both observables and unobservables behave as it says they do. However, in order for T to be empirically adequate, it is only necessary that observables behave as T says they do. What if observables behave as T says they do, but unobservables do not behave as T says they do? T would be empirically adequate but false. Thus, surrealists believe that T is empirically adequate, but do not believe that it is true.

Now that we are clear about the content of surrealism, we are ready to appraise the surrealist explanation that T is empirically adequate because observables behave as if it were true. The surrealist explanation is comprised of the following two statements:

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<sup>13</sup> Park, "Realism Vs. Surrealism," 606.

(E) T is empirically adequate.

(O) Observables behave as if T were true.

Musgrave contends that (E) and (O) are not substantially different assertions but mere verbal variants. For him, saying that observables behave as if T were true “is just a fancy way of saying that *T* is observationally or empirically adequate.”<sup>14</sup> He insists that “saying that the phenomena are *as if* the theory were true is just saying that the theory is empirically adequate.”<sup>15</sup> He also maintains that “to say that a theory is empirically adequate is just to say that the phenomena are *as if* it were true.”<sup>16</sup>

Musgrave’s linguistic intuition led him to the view that (E) and (O) are merely different formulations of the same assertion, and his linguistic intuition is not groundless. We can *infer* (O) from (E) and vice versa. For example, the belief that the special theory of relativity is empirically adequate entitles us to infer that observables behave as if it were true. The belief that observables behave as if it were true entitles us to infer that it is empirically adequate. After all, that is what it is to embrace (E) or (O). So it appears that (E) and (O) are mere verbal variants. Musgrave’s view about (E) and (O) holds an important implication regarding the surrealist explanation. If his view is true, the surrealist explanation is circular, i.e., (O) is (E) in disguise. Hence, the surrealist explanation amounts to explaining “the empirical adequacy of a theory in terms of its empirical adequacy.”<sup>17</sup>

In my view, however, (E) and (O) are not mere verbal variants, but substantially different assertions. (E) is an assertion about T, whereas (O) is an assertion about the world. (E) claims that T has a certain semantic property, viz., empirical adequacy. By contrast, (O) claims that observables behave in a certain manner. Thus, (E) and (O) are different claims about different targets. Consider also that (E) is merely the restriction of (T) to observational claims, while (O) is merely the restriction of (W) to observables. So if (T) and (W) are substantially different assertions, (E) and (O) are also substantially different assertions. As we have seen in Section 2, (T) and (W) are substantially different assertions. Therefore, (E) and (O) are also substantially different assertions, *pace* Musgrave.

Musgrave takes (E) and (O) to be mere verbal variants, despite the fact that (E) is a claim about T, whereas (O) is a claim about the world. So it is natural for him to suggest that the truth of T explains why observables behave as if it were

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<sup>14</sup> Musgrave, “The Ultimate Argument for Scientific Realism,” 243.

<sup>15</sup> Musgrave, “Strict Empiricism Versus Explanation,” 78.

<sup>16</sup> Musgrave, “Strict Empiricism Versus Explanation,” 76.

<sup>17</sup> Musgrave, “Strict Empiricism Versus Explanation,” 84.

true. He says, "T's actually being true is the best explanation of why all the observable phenomena are as if it were true."<sup>18</sup> Note that he explains the behavior of the world in terms of the semantic property of T.

In my view, however, it is wrong to do so. The world behaves as it does irrespective of how we describe it. For example, heat is as it is, and it behaves as it does, regardless of whether we describe it as caloric fluid or as the mean kinetic energy of molecules. It is incoherent to say that cold and hot objects in contact with each other assume the average temperature because the kinetic theory is true. By contrast, it is coherent to say that cold and hot objects assume the average temperature because the fast-moving molecules of the hot object slow down and the slow-moving molecules of the cold object move faster. In general, an event should be explained not in terms of a semantic property but in terms of another event.

Of course, we can make an *inference* from the truth of T to the behavioral pattern of observables. It does not follow, however, that we can *explain* the behavioral pattern of observables in terms of the truth of T. It has become an accepted point in philosophy of science that inference and explanation are two different affairs. As Sylvain Bromberger<sup>19</sup> has pointed out, it is legitimate to infer the length of the flagpole from the length of the shadow, but illegitimate to explain the length of a flagpole in terms of the length of its shadow.

Let me present a thought experiment to make my foregoing objection more convincing. Imagine a possible world in which God changes the way the world behaves via changing the truth-values of T. For example, God invests the theory of gravity with truth during the day but with falsity at night, so an apple falls downwards in the daytime, but rises upwards at night. God does not directly change the way the world behaves. He rather does so by changing the truth-values of the theory of gravity. Thus, the semantic property of the theory of gravity is the immediate cause of the way this possible world behaves. In such a possible world, it would be legitimate to explain an event in terms of a semantic property. For example, it would make perfect sense to say that the apple falls down because the theory of gravity is true.

In the actual world, however, it is wrong to say that observables behave as T says they do because it is true, or to say that observables behave as if T were true because it is empirically adequate. Such explanations are all conceptually flawed. It is only legitimate to explain the semantic property of the truth or empirical

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<sup>18</sup> Musgrave, "Strict Empiricism Versus Explanation," 83.

<sup>19</sup> Sylvain Bromberger, "Why Questions," in *Mind and Cosmos*, ed. R. G. Colodney (Pittsburgh, PA: University of Pittsburgh Press, 1966).

adequacy of T in terms of how the world behaves. So we can say that T is true because the world behaves as T says it does, or that T is empirically adequate because observables behave as if it were true. In other words, in the actual world, (W) can explain (T), but not vice versa, and (O) can explain (E), but not vice versa. This asymmetric explanatory relation of (T) and (W) further shows that they are substantially different assertions, and that the correspondentist explanation is not circular. Similarly, the asymmetric explanatory relation of (E) and (O) further shows that they are substantially different assertions, and that the surrealist explanation is not circular either.

One might attempt to defend Musgrave's view about the surrealist explanation by appealing to deflationism, an alternative to the correspondence theory. According to deflationism, 'It is true that p' means no more than p, i.e., 'It is true that p' and 'p' are equivalent statements. It follows that (T) and (W) are equivalent. Given that (E) and (O) are just the restrictions of (T) and (W) to observables, (E) and (O) are also equivalent. It follows that (E) and (O) are mere verbal variants. Thus, under deflationism, Musgrave is right after all.

It is doubtful, however, that Musgrave would endorse the preceding deflationist defense of his view that the surrealist explanation is circular. He says that "The aim of science, realists tell us, is to have true theories about the world, where 'true' is understood in the classical correspondence sense."<sup>20</sup> In short, Musgrave operates under the correspondence theory when he argues that (E) and (O) are mere verbal variants, so the surrealist explanation is circular.

So far, I have argued that (E) and (O) are substantially different assertions, so the surrealist explanation is not circular. Let me now turn to the confrontation between the surrealist explanation and the realist explanation that T is empirically adequate because it is true. The surrealist explanation invokes the behavioral pattern of observables, whereas the realist explanation invokes the truth of T, to explain why T is empirically adequate. Neither the surrealist explanation nor the realist explanation suffers from a conceptual problem.

André Kukla,<sup>21</sup> Lyons,<sup>22</sup> and Mizrahi<sup>23</sup> would take the surrealist explanation as a serious alternative to the realist explanation. Kukla states that the "observable world behaves as if our theories are true."<sup>24</sup> In a similar vein, Lyons claims that the "mechanisms postulated by the theory and its auxiliaries would, if actual, bring

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<sup>20</sup> Musgrave, "The Ultimate Argument for Scientific Realism," 229.

<sup>21</sup> André Kukla, *Studies in Scientific Realism* (New York: Oxford University Press, 1998).

<sup>22</sup> Lyons, "Explaining the Success of a Scientific Theory."

<sup>23</sup> Mizrahi, "Why the Ultimate Argument for Scientific Realism Ultimately Fails."

<sup>24</sup> Kukla, *Studies in Scientific Realism*, 22.

about all relevant phenomena thus far observed and some yet to be observed at time  $t$ ; and these phenomena are brought about by actual mechanisms in the world.”<sup>25</sup> Mizrahi also says that the “observable world behaves as if our mature scientific theories are true.”<sup>26</sup> He would say that there is no good reason to prefer the realist explanation over the surrealist explanation because the realist explanation is empirically no better than the realist explanation, i.e., “both make the same testable predictions.”<sup>27</sup>

Which one is better, the realist explanation or the surrealist explanation? Musgrave prefers the realist explanation to the surrealist explanation on the grounds that the surrealist explanation is circular. He argues that “truth explains empirical adequacy better than empirical adequacy does, because the latter ‘explanation’ is completely circular.”<sup>28</sup> As we have seen, however, the surrealist explanation is not vacuous. Hence, we are still left with the question: which explanation is better? I defend my answer to this question in the next section.

#### 4. The Real Problem

In general, an explanation is appropriate when it serves the explainers’ purposes and/ or the explainees’ purposes, and is inappropriate when it serves the purposes of neither. Suppose that a jet airliner crashes, and that investigators rush to the crash site. After investigating the wreckage, they hold a news conference. They announce, to the surprise of news reporters, that the jet airliner crashed due to the gravitational force between it and the Earth. This explanation, although conceptually sound, is inappropriate because it serves neither the explainers’ nor the explainees’ purposes. It merely makes an obvious point that interests neither the explainers nor the explainees. Such an explanation might, however, be appropriate in science classrooms, in which teachers aim to convey the concept of gravity to students. It would serve both the teachers’ purpose to teach the concept of gravity and the students’ purpose to learn the new concept. This story suggests that explainers’ and explainees’ purposes determine whether an explanation is appropriate or not.

This general point applies to the surrealist explanation. The surrealist explanation is appropriate when it serves the explainers’ and/or explainees’ purposes, and is inappropriate when it serves neither. Suppose that professors wish to share the concept of empirical adequacy with students in a philosophy of science

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<sup>25</sup> Lyons, “Explaining the Success of a Scientific Theory,” 900.

<sup>26</sup> Mizrahi, “Why the Ultimate Argument for Scientific Realism Ultimately Fails,” 133.

<sup>27</sup> Mizrahi, “Why the Ultimate Argument for Scientific Realism Ultimately Fails,” 133.

<sup>28</sup> Musgrave, “Strict Empiricism Versus Explanation,” 87.

class. Under these circumstances, the surrealist explanation would be appropriate because it would prove illuminating to students who were previously unfamiliar with the concept of empirical adequacy, enabling them to grasp both the relationship between empirical adequacy and observables, and the relationship between empirical adequacy and truth. The surrealist explanation would serve both the explainers' purpose and the explainees' purpose.

What if the explainers and explainees are already familiar with the concept of empirical adequacy? The surrealist explanation, although conceptually sound, would be inappropriate. It would merely make an obvious point that interests no one, just as the investigators' gravitational explanation above makes an obvious point that interests no one. Hence, the surrealist explanation would serve no one's purpose.

Surrealists might reply that even if explainers and explainees are already familiar with the concept of empirical adequacy, the surrealist explanation can nevertheless serve a certain purpose, viz., to undermine the no-miracles argument.<sup>29</sup> The no-miracles argument was originally constructed to explain not the empirical adequacy of T but the success of T. It, however, can be recast to explain the empirical adequacy of T. The recast version would hold that the empirical adequacy of T would be a miracle if T were false, so the truth of T best explains the empirical adequacy of T. The argument maintains "not just that truth explains empirical adequacy, but that it is the only explanation, or at least the best explanation."<sup>30</sup> Surrealists, by providing an alternative to the realist explanation, have imposed upon scientific realists the burden of proving that the realist explanation is better than the surrealist explanation. Consequently, the surrealist explanation is an appropriate one in the scientific realism debate.

It is, however, debatable whether the surrealist explanation is an alternative to the realist explanation. The surrealist explanation is a conceptual analysis laying bare the necessary and sufficient conditions for the empirical adequacy of T, just as the correspondentist explanation is a conceptual analysis laying bare the necessary and sufficient conditions for the truth of T. Surrealists do not make an inductive inference about T, any more than correspondentists make an inductive inference about T. After all, the surrealist explanation is just the restriction of the correspondentist explanation to observational claims and observables. It is for this reason that if you were already familiar with the concept of empirical adequacy, you would immediately accept the surrealist explanation. If you do not accept the

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<sup>29</sup> Hilary Putnam, *Mathematics, Matter and Method (Philosophical Papers, vo. 1)* (Cambridge: Cambridge University Press, 1975), 73.

<sup>30</sup> Musgrave, "Strict Empiricism Versus Explanation," 84.

surrealist explanation, that shows not that you refuse to make an inductive inference about T, but that you do not understand what it means to say that T is empirically adequate. In short, the surrealist explanation is not an inductive inference but a clarification of a concept.

By contrast, when realists advance the realist explanation, they are in the business of making an inductive inference about T. From the premise that T is empirically adequate, they inductively infer that it is true. They are not in the business of clarifying the concept of empirical adequacy. They do not say that the explanans is the necessary and sufficient condition for the explanandum. After all, it is obviously false that the truth of T is the necessary and sufficient condition for the empirical adequacy of T. The realist explanation involves an inductive inference from the empirical adequacy of T to the truth of T. For this reason, antirealists reject the realist explanation, even if they are already familiar with the concept of empirical adequacy. They reject the realist explanation not because they do not understand what it means to say that T is empirically adequate, but because they are not willing to run the epistemic risk involved in the inductive inference. In short, the realist explanation involves not a clarification of a concept but an inductive inference.

The difference between the surrealist explanation and the realist explanation discussed above calls for the distinction between what I call conceptual and empirical explanations. A conceptual explanation is an attempt to illuminate a concept by providing a necessary and a sufficient condition for it. The former is called an *analysandum*, and the latter is called an *analysans*. No inductive inference is made from the *analysandum* to the *analysans*. By contrast, an empirical explanation is an attempt to illuminate an explanandum by providing an explanans. An inductive inference is made from the explanandum to the explanans. The surrealist explanation exemplifies a conceptual explanation, whereas the realist explanation exemplifies an empirical explanation.

Consider now how the surrealist explanation and the realist explanation could be refuted. We can conceive of some counterexamples, some scientific theories, that drive a wedge between the explanandum and the explanans of the realist explanation. Suppose that von Neumann and Dirac's version of quantum mechanics is empirically adequate, and that it is empirically equivalent to Bohm's version of quantum mechanics. Given that they make incompatible claims about unobservables, they are empirically adequate rivals, and they would constitute counterexamples undermining the realist inference from the empirical adequacy of T to the truth of T, i.e., from the explanandum to the explanans of the realist explanation. In contrast, we cannot even conceive of counterexamples

undercutting the surrealist inference from the analysandum to the analysans. Suppose that critics of surrealism present certain scientific theories, and then say that though they are empirically adequate, observables do not behave as if the theories were true. What they say would indicate not that the scientific theories are counterexamples to the surrealist explanation, but that they do not know what it is for T to be empirically adequate. In short, the realist explanation is subject to an empirical refutation whereas the surrealist explanation is not. This difference provides further support for my view that the surrealist explanation is a conceptual one, whereas the realist explanation is an empirical one.

What can we conclude from my view that with the surrealist explanation, surrealists are engaged in the *a priori* enterprise of clarifying the concept of empirical adequacy, whereas with the realist explanation, realists are in the *a posteriori* enterprise of making an inductive inference from the empirical adequacy of T to the truth of T? We can conclude that the surrealist explanation cannot be an alternative to the realist explanation. To use an analogy, there are many kinds of apples: Red Delicious, Granny Smith, Yellow Newton, etc. Suppose that you claim that Red Delicious is the most delicious apple. I present you with an orange, and request that you prove that Red Delicious apples taste better than the orange. You would immediately object that my request is illegitimate, saying that you were talking about apples, but not about oranges. Realists can say the same thing about surrealists' request to prove that the realist explanation is better than the surrealist explanation. When realists say that the realist explanation is the best explanation of the empirical adequacy of T, they mean that the realist explanation is the best *empirical* explanation. The surrealist explanation is not an empirical one but a conceptual one. It follows that the surrealist explanation cannot be an alternative to the realist explanation, and that it is wrong to say that the surrealist explanation undermines the realist contention that the realist explanation is the best empirical explanation of the empirical adequacy of T.

Surrealists might now go on the offensive against the realist explanation. What purpose does the realist explanation serve? My answer is that it serves the realist purpose of arriving at the realist explanans that T is true, i.e., realists claim that T is true on the grounds that the truth of T best explains the empirical adequacy of T. Since the realist explanation serves the realist purpose of supporting the truth of T, it is appropriate in the scientific realism debate.

Such a defense cannot be made for the surrealist explanation. Surrealists cannot say that the surrealist explanation serves the surrealist purpose of arriving at the analysans that observables behave as if T were true. After all, the analysans is nothing but the necessary and sufficient condition for the analysandum that T is

empirically adequate. The surrealist explanation only clarifies the concept of empirical adequacy, just as the correspondentist explanation only clarifies the concept of truth. It follows that surrealists can only say that the surrealist explanation serves the purpose of analyzing the concept of empirical adequacy, just as the correspondentist explanation serves the purpose of analyzing the concept of truth.

Interestingly, the surrealists' analysandum coincides with the realists' explanandum. Both realists and surrealists are explaining why T is empirically adequate. Clarifying the concept of empirical adequacy is not only what surrealists should do, but also what realists should do. After all, if the concept of empirical adequacy is obscure, it is pointless for realists to say that the truth of T best explains the empirical adequacy of T. It follows that surrealists are helping realists by providing the surrealist explanation of empirical adequacy, and that realists should endorse the surrealist explanation.

## 5. Objections and Replies

I argued above that (E) and (O) are not mere verbal variants but substantially different assertions. Recall that (E) and (O) are as follows:

(E) T is empirically adequate.

(O) Observables behave as if T were true.

Surrealists might insist that (E) and (O) are mere verbal variants on the grounds that they parallel (1) and (2):

(1) A term refers.

(2) The world contains something that is picked out by the term.

(1) and (2) are mere verbal variants, although (1) is a claim about a term, whereas (2) is a claim about the world. It follows that (E) and (O) are also mere verbal variants, although (E) is a claim about T, whereas (O) is a claim about the world.

My replies are two-fold. First, (1) and (2) parallel the analysandum and the analysans of the correspondentist explanation, (T) and (W):

(T) T is true.

(W) The world is as T says it is.

It follows that if (1) and (2) were mere verbal variants, (T) and (W) would also be mere verbal variants. As we have seen in Section 2, however, (T) and (W) are not mere verbal variants but substantially different assertions. Therefore, (1) and (2) are also not mere verbal variants but substantially different assertions.

Second, just as (W) is more fundamental than (T), so (2) is more fundamental than (1). It follows that just as (W) can explain (T), but not vice versa, so (2) can explain (1), but not vice versa. It sounds right to say that T is true because the world is as T says it is. In contrast, it sounds wrong to say that the world is as T says it is because T is true. Analogously, it sounds right to say that a term refers because the world contains something that is picked out by the term. By contrast, it sounds wrong to say that the world contains something that is picked out by a term because the term refers. This asymmetrical explanatory relation between (1) and (2) further indicates that (1) and (2) are substantially different assertions.

Moreover, it sounds wrong to say that an object exists because its term refers in the actual world. It sounds right to say so only in a possible world in which God makes objects come into being and pass out of being by changing the semantic properties of terms. For example, imagine that God makes 'electron' refer during the day and not refer at night. As a result, an electron exists during the day, but does not exist at night. In such a possible world, it makes perfect sense to say that an electron exists because 'electron' refers.

Let me now turn to a different objection. Berkeleyan idealists would say that T is empirically adequate not because observables behave as if it were true, but because God implants certain ideas in my mind as if it were true. Surrealists would retort that T is empirically adequate not because God implants certain ideas in my mind as if it were true, but because observables behave as if it were true. Thus, surrealists make an inductive inference about the world, i.e., they inductively infer that observables, as opposed to certain ideas in my mind, behave as if T were true. Since the surrealist explanation makes an inductive inference, it is an empirical explanation, and it is an alternative to the realist explanation.

This objection, although brilliant, can be reduced to absurdity. If the surrealist explanation were an empirical one for the reason stated above, the correspondentist explanation would also be an empirical one for a similar reason. When correspondentists say that T is true because the world is as T says it is, they are making an inductive inference about the world, i.e., they are inductively inferring that the material world, as opposed to the ideal world, is as T says it is. To go further, it would also be an empirical explanation to say that John is a bachelor because he is an unmarried adult male. When you give this explanation, you are inductively inferring that the combination of John's body and mind, as opposed to a collection of my ideas, is an unmarried adult male. These two explanations, however, are not empirical ones but conceptual ones. Therefore, the surrealist explanation is also a conceptual one.

The fact that the foregoing objection falls prey to a *reductio ad absurdum* indicates that there is an intrinsic problem with it. The intrinsic problem is that it involves a sudden change of frameworks from the materialist framework to the idealist framework. It is due to this change of frameworks that the surrealist explanation becomes an empirical one making an inductive inference about the world. If the framework did not change, the surrealist explanation would consistently be a conceptual one clarifying the concept of empirical adequacy.

Let me flesh out this abstract point. Under the materialist framework, to say that T is empirically adequate means that observables behave as if it were true. It does not mean that certain ideas occur in my mind as if T were true. After all, T would not be empirically adequate, even if certain ideas occurred in my mind as if it were true, if observables did not behave as if it were true. Once surrealists adopt the materialist framework and say that T is empirically adequate, they have no choice but to say that T is empirically adequate because observables behave as if it were true. They cannot say that T is empirically adequate because certain ideas occur in my mind as if it were true. To say so is to change the framework suddenly from the materialist framework to the idealist framework.

By contrast, under the idealist framework, to say that T is empirically adequate means that certain ideas occur in my mind as if it were true. This does not mean that observables, immaterial objects, behave as if T were true. Once surrealists adopt the idealist framework and say that T is empirically adequate, they have no choice but to say that T is empirically adequate because certain ideas occur in my mind as if it were true. They cannot say that T is empirically adequate because observables behave as if it were true. To say so is to change the framework suddenly from the idealist framework to the materialist framework.

In short, if surrealists interpret the analysandum, (E), under the materialist framework, they should provide a materialist analysans. If they interpret it under the idealist framework, they should provide an idealist analysans. Following these rules would inevitably result in conceptual explanations.

## 6. Conclusion

Just as the correspondentist explanation makes it clear that the world makes T true, so the surrealist explanation makes it clear that the world makes T empirically adequate. In other words, just as the correspondentist explanation claims that the world is the truth-maker of T, so the surrealist explanation claims that observables are the empirical-adequacy-maker of T. It follows that it is not circular to say that T is empirically adequate because observables behave as if it were true, any more than it is circular to say that T is true because the world is as T says it is. By making

these claims, both correspondentists and surrealists are engaged in conceptual analyses, attempting to lay bare the necessary and sufficient conditions for the truth and empirical adequacy of T, respectively.

The surrealist explanation is a conceptual one, whereas the realist explanation is an empirical one. The surrealist explanation merely clarifies the analysandum in terms of the analysans, whereas the realist explanation involves an inductive inference from the explanandum to the explanans. The surrealist explanation is a trivial one for those who are already familiar with the concept of empirical adequacy, whereas the realist explanation is not a trivial one for those who are already familiar with the concept of truth. In sum, the surrealist explanation is different in kind from the realist explanation, and surrealism is not an alternative to scientific realism.<sup>31</sup>

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