Falsificationism Unfalsified: a Reply to Callahan's "Why Popper is Wrong on Induction"

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Epistemology is often a problem for libertarianism. Many libertarian texts assume that they need to do more than explain and defend the libertarian conjecture. Instead, they try to offer epistemological support for it (whether empirically or morally); which falsificationism and, more broadly, critical rationalism explains is not possible.[1] Moreover, they often mistake this attempt at support for an explanation of libertarianism (which ought to include an abstract theory of liberty and how it relates to liberty in practice).[2] Therefore, when a criticism of falsificationism appears on a libertarian website[3] it seems useful to reply to it (even though no discussion of libertarianism itself is involved).

It once appeared to the current author that if there is a *pons asinorum* in epistemology, then maybe it is being able to understand falsificationism.[4] Even philosophers and logicians sometimes get hold of the wrong end of the stick, and then used it to beat off anyone who tries to explain it to them. The brief blog called "Why Popper is Wrong on Induction" (the blog) falls into this category. It asserts that Popper's "error turns on viewing falsification and confirmation as all or nothing affairs" and that this is refuted by the fact that "no theory is ever so thoroughly falsified that there is no way to rehabilitate it". This is badly to misunderstand falsificationism. First, a summary of what it is might help.

Given that we do not have an all-seeing view of the universe, we cannot in principle perceive the truth of universal propositions such as "all swans are white" (where that includes all past, present, and future swans anywhere in the universe). Neither could any finite number of observations of white swans (even if they could be guaranteed to be accurate, which they cannot) add any strength to the universal theory that they are all white: because the observations are a vanishingly[5] small number relative to the universal theory. Therefore, we cannot even make our theories more probable (except on the basis of assumptions, or conjectures, about probability that cannot themselves be shown to be independently probable). However, says Popper, *nil desperandum*. There is a logical asymmetry between verification and falsification. We could in principle (although we might always be mistaken) perceive a single non-white swan. And if we in fact (as a matter of reality) do so, then that fact would *as a logical implication* falsify the theory that all swans are white. Hence science can test theories but not support them.

Therefore, falsificationism is ultimately about the situational logic of our being finite epistemological beings. This argument has to be understood and criticised first (it is not advanced as an axiom or a dogma) before we proceed to the obvious next issue: how do we know that the apparent refutation is an actual refutation? That too remains a conjecture. We can also test that conjecture, but only by making assumptions that we do not attempt to test at the same time. It is the logical possibility of falsification that we use, not conclusive falsification. Ultimately, it is 'conjectures all the way down' (as opposed to turtles). It is possible we are mistaken about any of our theories. But there is no need to fall into complete scepticism. Where we 'know' things—i.e., are aware of the way the world is—we simply realise that

[1] Epistemological 'supporting justifications' of theories, observations, and theses face a trilemma: they are all based on unsupported assumptions, or conjectures, and any attempt to support those assumptions entails infinite regress, or dogmatic assertion, or circularity (none of which can offer support).

[2] For a short introduction to a philosophical theory of libertarianism that relates it to critical rationalism, see Lester, J. C. 2021. "Eleutherological Conjecturalist Libertarianism: a Concise Philosophical Explanation" (PhilPapers: https://philpapers.org/rec/INDNLA).

[3] Callahan, Gene. 2004. "Why Popper Is Wrong on Induction", LewRockwell.com (http://www.lewrockwell.com/callahan/callahan143.html)

[4] Having read Popper and accepted falsificationism while still a schoolboy, it then seemed for a long time to be an epistemological *pons asinorum* (asses bridge): the first severe test for the inexperienced. But it now looks more like it may be the final severe test for the experienced: a *pons strutionum* (owls bridge)? However, maybe it is also harder to accept radical challenges to common sense later in life.

[5] And possibly 'infinitely small' relative to most scientific theories.

this can only ultimately be by conjecture (although some conjectures are well-tested). And we do not have a reason to reject any particular theory unless there is a cogent argument or evidence against it.

We can now return to the blog's suggestion that, "given an experimental result that apparently refutes a theory, one can always change an auxiliary hypothesis instead of the central tenet of the theory, and so rescue the theory". Why should we do that unless we suspect that there is an error in the particular "auxiliary hypothesis"? We want to find the truth, and we know that conjecture and testing is the only way to proceed. Therefore, we ought to want to find genuine refutations if possible; not avoid them. But if we suspect they are not genuine, then it would be folly to accept them. We not only have to test our theories, we also have to test (or criticise) our tests. This, and the conjectural nature of all such tests, is often overlooked by critics of falsificationism. They often assume that a falsification must be confirmed if falsificationism is to operate. No: falsifications remain conjectural. Strictly, it is also an error to think that a theory can have a "central tenet". A theory says what it says; and if any part of the theory is false then the overall theory is false. An 'adjusted' theory, however similar, is really a new theory.

Copernicus had the insight that if "the sphere of the stars was ten times farther from the earth than had previously been believed" then the observed lack of parallax is not a problem. This was a good criticism of the parallax test of heliocentrism. At the time scientists had no way of knowing how far away the stars really were. Therefore, it would have been arbitrary to give priority to the first conjecture as to their distance just because it was the first. It is not evasively *ad hoc* to produce a good criticism of a test. Coming up with our best criticisms of all our conjectures, *including our conjectured tests*, is part of the falsificationist method. (And by parallel reasoning there is also nothing anti-falsificationist, as the blog goes on to imply there would be, were Copernicus to have "simply moved the stellar sphere ten times farther away still" if better instruments still did not detect the change.) Copernicus had shown that we have two unfalsified and, at the time, unfalsifiable theories (with respect to their disagreements, at least). There is nothing anti-falsificationist about Copernicus's conjecturing that the heliocentric theory was the correct one. And although Copernicus's theory did not simply knock out Ptolemy's theory by its initial fit with the apparent facts, it is generally acknowledged that it had superior explanatory power and overall cohesion.

The blog also holds it to be a problem for "the Popperian" (the falsificationist, at least) that it was only after more accurate instruments were able to measure the parallax that "heliocentrism became scientific!" Not quite. That is when one aspect became *empirically* scientific. Both the heliocentric and geocentric theories were not testable with respect to their differences. Thus far they were not scientific in the empirical sense. But a falsificationist can still say that they were part of 'science' more broadly conceived to include all the theories about the material world that are as yet, or currently, unfalsifiable despite our best efforts to make them so (just as even falsifiable scientific theories have unfalsifiable aspects and assumptions). In this way much modern theoretical physics is currently unfalsifiable but is unproblematically called 'science' nevertheless.

We are then told that it "is true that no theory is ever completely confirmed" and that "each piece of evidence supporting the theory raises the degree to which it is confirmed". But it is not explained how, given an infinite theory and finite evidence, it can possibly make any sense whatsoever to suppose that a theory could even begin to be confirmed. How is it *logically* possible? The blog ignores the fundamental epistemological arguments; and even ignores the universal scientific theories they are primarily about. Instead, it alights on historical examples to illustrate its point. But history is not science: history is about unique past events that cannot be replicated as science requires. Nevertheless, falsificationism can still be applied to unique past events albeit with more difficulty.

The blog imagines that two historians tell us two different "theories": "Caesar crossed the Rubicon in a deliberate act of defiance of the Roman Senate and constitution" and "King Arthur took on a dozen wives in order to cement diplomatic relationships with neighbouring kingdoms". The blog asserts that all a falsificationist can say is that "neither theory has been falsified". However, as the best evidence suggests that King Arthur never existed (and not that "no one is even sure if King Arthur was a real

person"), then that would seem to falsify the second theory (although that theory has nothing to do with science). Where is the "abundant, indeed, overwhelming evidence that leads us to believe the first historian's theory"? To cut a long story short, how can the appearance of something even before our own eyes be any guarantee that it is what it appears to us to be? Even if we test it and can be sure our tests are infallible, we have only a finite number of tests of what is implicitly a theory with universal aspects—many being counterfactual—despite being an apparent 'singular observation'. All that said, if a theory survives great scrutiny, then it can be a critically-preferred conjecture; rather than, at the other extreme, an uninformed, inchoate, and untested conjecture. Consequently, it is a mistake to assert that all that can be said of two unfalsified theories is that "neither theory has been falsified".

Again, how can a scientific theory be "more or less confirmed"? How can "different degrees of belief... [be]...scientifically founded" and "different pieces of evidence...offer varying degrees of confirmation for a theory"? Belief has nothing to do with science, in any case. Scientific theories can be stated objectively and any scientific evidence against them is objective and can be replicated. It is not a scientific matter whether anyone believes a theory or with how much psychological certainty. Merely invoking the name of "Bayesianism" adds nothing here. The blog's title cites "induction", and it eventually does reach the subject. But then its entire explanation appears to be as follows: "The regularity of physical events, and therefore the ability to induce causes from effects, is not a *conclusion* of the physical sciences, but, rather, a *premise* of them". Falsificationists can agree with the conjecture that there are some regularities in physical events, but only because immediate observation appears to falsify the theory that there are no regularities. And particular regularities appear within particular theories as assumptions, i.e., as parts of the theory and not a "premise" of science itself (even if we assume that the universe is full of all and only "regularities", that doesn't offer any support to theories). But what does it even mean to "induce causes from effects"? What is valid "induction"? The blog nowhere explains it. By contrast, falsificationism is a definite coherent theory with clear explanatory arguments. They are not fiendishly difficult to follow, just somewhat counterintuitive given current common sense.

It is confused of the blog to assert that it is Popper's "situational logic" that has "supposedly demolished inductivism". Induction (the view that finite evidence can somehow support more general theories) had long been shown to be a fallacy. David Hume (1711-1776) is the, relatively, modern person who rediscovered and emphasised the fallacy (but thought we were stuck with induction as a custom of mind and practical necessity). There are similar arguments going back many hundreds of years, most famously perhaps to Sextus Empiricus (c. 160–c. 210 CE). What Popper did that was new is explain that we still can, and must, use the hypothetico-deductive method instead: conjecturing theories, deducing consequences, and testing for them. Hence, we do not need to keep trying to make sense of induction. There is no role whatsoever that "induction plays in the physical sciences".

Let us conclude with the blog's final point of alleged "logic": "logic can never be employed to 'refute' premises: it can only refute the conclusions drawn from them". It is, in fact, a logical howler to suppose that "logic can never be employed to 'refute' premises". If A entails ~A, then the premise A is refuted. That is actually a theorem in logic (provable not hypothetically but as necessarily true). And where any premise logically entails inconsistent conclusions, that also refutes the premise. That is also a theorem. Moreover, we can never use logic to refute conclusions; although we might use it to show that they are not entailed. More relevantly here, however, if we state the inductivist assumption as 'finite evidence can support more general theories', then we can apparently use the same evidence to 'support' different theories that are inconsistent with each other. And this inconsistency therefore logically refutes the inductivist assumption that entails it.