SCIE1000 Philosophy Essay

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This essay will discuss Karl Popper's Falsificationist response to Kuhn's paradigm model of science, to determine if the Hypothetical-Deductive model presents a rational philosophy of science that is unaffected by social bias and lines up with history and the present. As both men agreed, **it will be assumed for this essay that science is currently intrinsically rational and always has been**. Kuhn argues this has always been the case including social bias, but Popper believed the social biases present in history are irrational and science should proceed only rationally using Falsification. In light of scientific history vindicating social biases existence, we must therefore conclude that Falsification doesn't provide an accurate model of science.

First, the Kuhnian view.
According to Thomas Kuhn, scientific knowledge doesn't proceed purely rationally by immediately rejecting hypotheses when contrary evidence is discovered. Rather, a certain level of "skilled judgement" is necessary, both within a paradigm and choosing between paradigms, such that the current paradigm isn't questioned under "normal science". "Paradigms" are discrete checkpoints in the collective understanding of reality, such that mere "puzzle solving" cannot bridge the gap between them rendering them incommensurate. **I will assume that the history of science and the present show this description to be accurate**, that is, evidence against the current paradigm being ignored until a scientific revolution takes place (Kuhn's view). You can imagine real scientists are lazy and blame their equipment before the well established theories of their time, a historical example being Millikan's measurement of the charge of the electron and Richard Feynman's insightful two paragraphs on the topic (https://en.wikipedia.org/wiki/Oil_drop_experiment#Millikan.27s_experiment_as_an_example_of_psychological_effects_in_scientific_methodology).
To elaborate on the idea of incommensurate, I will take an example close to my heart as a Computer Science student. The Imperative programming paradigm views the computer as a machine that executes instructions in and at a certain time (performance), in a certain way (CPU, GPU e.t.c.) and using real, fallible hardware. This is in stark contrast to the Functional programming paradigm, which views the computer as a pure, almost mathematical state machine, timeless and infinite. Functional programing came about second but is immensely useful, and aspects of its thinking permeate many languages today. It is, however, fundamentally opposite to the fallible, finite imperative perspective of reality, a clear example of incommensurate paradigms.

Before Kuhn, though, Falsificationism (synonymous to the Hypothetico-Deductive model) was argued by Karl Popper.
Popper's Hypothetico-Deductive model was presented initially as an alternative to David Hume's Induction problem (https://plato.stanford.edu/entries/induction-problem/), so stresses the lack of inductive reasoning necessary to draw the conclusion that a hypothesis is true. This is achieved by believing no hypothesis can be categorically or 'absolutely' true, but, can instead be very probably false given evidence.
Popper also believed that science was rational only through the aggressively progressive and systematic falsification of hypotheses, with *only* a scientist's *independent* imagination used to construct hypotheses. The nature of 'independent' above rejects the social bias present in Kuhn's presentation of science and gives Popper's philosophy a sense of universality, as Popper believed rational science should come to the same conclusions regardless of physical location as much as social dynamics. Falsificationists also believe that when contrary or anomalous evidence is discovered, *immediately* scientists should be critical of the hypothesis under examination (and the many auxiliary hypotheses and assumptions underpinning their experiment) because logically one of them must have been false to have found anomalous evidence. (https://plato.stanford.edu/entries/popper/#GrowHumaKnow) This is directly opposing Kuhn's analysis of scientific history, in Popper's Falsificationism "background knowledge" can always be critically analyzed but for Kuhn the current paradigm shouldn't be continuously critiqued in its entirety as this is unproductive and not "normal science". Kuhn's ignoring of evidence without immediate critical analysis is irrational, believes Popper. Surely a bias towards the collectively accepted paradigm is no better than the

bandwagon effect or peer pressure? Falsification hence responds to Kuhn's views by considering them an irrational model of science, based on the premise **social (and even religious at Kuhn's most extreme) views and biases shouldn't affect the outcome of 'proper' science**.

I have, however, a number of objections to the falsificationist perspective of the rationality of science.
Firstly, the picture of science as systematic and continuously and critically analyzing the current paradigm does not line up with the history of science and the present. This was assumed and expounded upon above. If a falsificationist accepts this premise, however, they must conclude historically science has been sub-par and illogical. I have already assumed science is intrinsically rational in the introduction, hence, the falsificationist view must not be completely accurate about what science *actually* is, although it may still be a good theoretical goal.
Secondly, the Falsificationist view of science isn't even a perfect theoretical goal because it doesn't, in fact, solve all the problems of making science perfectly unbiased and hence rational under its own assumptions. It still acknowledges the centerpiece of progress is the *imagination* present in devising hypotheses. Therefore, I object to Popper's claim that falsification puts forward a more rational philosophy than Kuhn's, as the imaginative step can (and does) contain the collective biases present in Kuhn's paradigm model of science. As an informative example, a normal scientist subscribing to a falsificationist view might only ever imagine hypotheses within his current paradigm all his life (maybe to comfortably keep his research position?), even if he doesn't acknowledge the predictive power of Kuhn's paradigms. Hence, the falsificationist view doesn't in fact sidestep the bandwagon effect, but merely hides it within the step of creating hypotheses and then talking about the next step of falsification instead.

In conclusion, since science is and has always been rational and has contained social biases, and that the Hypothetico-Deductive model doesn't in fact get rid of social biases, therefore Karl Popper's Falsificationist philosophy is an inaccurate model of science.

References

Horgan, John. "The Paradox of Karl Popper." Scientific American, 22 Aug. 2018, www.scientificamerican.com/blog/cross-check/the-paradox-of-karl-popper/.