

Lakatos on justificationism

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The methodology of scientific research programmes (Lakatos 1978) is an improvement of Popper's demarcation criterion between science and non-science, a theory of scientific rationality. For Popper, a theory is scientific only if it is empirically falsifiable, that is, if it is possible to specify observational statements that would prove to be wrong. A theory is a good science if it is refutable, risky, can solve problems and resist successive attempts to reject it. It must be highly falsifiable, well tested, but (so far) unfalsified. Lakatos objects that while Popper's criterion is relatively correct, it is too restrictive because it would exclude too much from day-to-day scientific practice as unscientific and irrational. Scientists often rationally

persist with theories that, according to Popper's standards, should have rejected them as being "refuted".

But if scientists persist with "refuted" theories, either scientists are not scientific, or Popper is not right in what constitutes a good science. Lakatos's idea is to build a methodology of science and, along with it, a delimitation criterion whose precepts are more in line with scientific practice. Falsifiability continues to play a role in Lakatos's conception, but its importance is somewhat diminished, effectively abandoning it as a criterion of delimitation between science and non-science. A research program may be falsifiable (in a certain sense), but not scientific, and it can be scientific but non-verifiable. Also, every successive theory in a degenerative research program can be falsifiable, but the program may not be scientific. According to Lakatos, it must not be a crime to protect the inadequacy of the research program from an empirical rejection. For Popper, it is a crime against science to defend a theory rejected by "introducing ad hoc some auxiliary assumption, or by reinterpreting the theory ad hoc in such a way that it escapes refutation." (Popper 2002)

Lakatos begins the article with a brief introduction to Popper's concept of falsifiability, considering that the essence of his "recipe" is "boldness in conjectures on the one hand and austerity in refutations on the other." (Lakatos 1978, 8) He then makes the distinction between Popper, for which science is "the constant revolution" and criticism is the heart of the scientific enterprise, and Kuhn, for which the scientific enterprise is exceptional and extra-scientific, and criticism is in the "normal" anathema.

Lakatos continues with a presentation of knowledge theses. According to the scientific "justificationist" method, knowledge consisted of proven sentences. Classical intellectuals (or "rationalists," in the narrow sense of the term) have accepted extremely varied - and powerful

“proofs”, through revelation, intellectual intuition, experience. These, with the help of logic, have allowed them to prove any kind of scientific statement. Classical empiricists accepted as axioms only a relatively small set of "factual propositions" that expressed "hard facts". The value of their truth has been established by experience and has been the empirical basis of science. To prove scientific theories based on the narrow empirical basis only, they needed a much stronger logic than the deductive logic of classical intellectuals: "inductive logic." All justificationists, intellectuals or empiricists, have agreed that a single statement expressing a "hard fact" can reject a universal theory,(Lakatos 1978) but few believed that a finite set of factual sentences might be enough to prove an "inductivist" universal theory.

Justificationism (the identification of knowledge with proven knowledge) was replaced in time by skepticism, which claimed that there is (and could not exist) any proven knowledge and, therefore, no knowledge in general. Classical rationalists have tried to save the *a priori* synthetic principles of classical intellectuals and empiricists. For all, scientific honesty demanded not to say anything that is not proven. But, according to Lakatos, the conclusion was that “all theories are equally unprovable”. (Lakatos 1978, 11) Probabilism, developed by a group of philosophers in Cambridge, considered that although scientific theories are equally inappropriate, they have different degrees of probability compared to available empirical evidence. This way, scientific honesty requires less than was thought; it consists in expressing some very probable theories; or even by specifying, for each scientific theory, the evidence and probability of the theory in the light of that evidence.

Later, Popper assumes that all theories have a zero probability, whatever the evidence; all theories are not just as unpredictable but equally unlikely.

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