

On an Allegedly Essential Feature of Demarcation Criteria of Science

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Draft: 2011-04-20

Abstract

Laudan's argument against the possibility of a demarcation criterion for scientific theories rests on establishing that any criterion must be a necessary and sufficient condition. But Laudan's argument at most establishes that any criterion must provide a necessary condition and a possibly different sufficient condition. His own claims suggest that such a criterion is possible.

While some consider criteria for the demarcation of science from non-science an important topic of research (cf. Mahner 2007; Hansson 2008), others doubt that such a demarcation criterion is possible at all. A number of proponents of the latter view (e. g., Devine 1996, 331; Monton 2009, 49; Clarke 2009, 134; Leiter 2011, 6ff) endorse and rely on an influential article by Laudan (1983) that, as I will argue, relies on a non-sequitur and actually suggests the opposite of its purported conclusion.

Laudan (1983, 123) considers several candidates for a demarcation criterion and argues that none of them "can be a necessary and sufficient condition for something to count as 'science', at least not as that term is customarily used." This is the main result of his paper. Based on a brief plausibility consideration about the "epistemic heterogeneity of the activities and beliefs customarily regarded as scientific", Laudan (1983, 124) further suggests the general futility of any search for a demarcation criterion. In objection to Laudan, proponents of demarcation criteria have contended that it is not essential for a demarcation criterion to provide a necessary and sufficient condition for scientific theories (e. g., Thagard 1988, 159; Derksen 1993, 20; Mahner 2007, 521f; Pennock 2011, 183; cf. Ruse 1982, 20). However, Laudan's demand is not just a stipulation, but rather rests on an argument that must be addressed for the objection to have any force.

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In his argument, Laudan (1983, 118f) concludes that any criterion weaker than a necessary and sufficient condition could not achieve what a demarcation criterion needs to achieve, because a merely necessary condition would not allow inferring that something is a science, and a merely sufficient condition would not allow inferring that something is not a science. One cannot, for example, argue that the theory of evolution is scientific and creation science is not, because

[w]ithout conditions which are both necessary and sufficient, we are never in a position to say ‘*this* is scientific: but *that* is unscientific’. (Laudan 1983, 119)

But Laudan’s claim is false: To be able to say that a is scientific (Sa) while b is not ($\neg Sb$), all that is needed is one sufficient condition φ that is fulfilled by a , $\forall x[\varphi(x) \rightarrow Sx] \wedge \varphi(a)$, and one necessary condition ψ that is not fulfilled by b , $\forall x[Sx \rightarrow \psi(x)] \wedge \neg\psi(b)$. Laudan’s demand that φ and ψ be one and the same is supererogatory.

Without the demand for a single necessary and sufficient condition for scientific theories, Laudan’s argument actually suggests the opposite of what he intends to show. He states that the candidates for a demarcation criterion are implausible as necessary and sufficient conditions, and that “in *most* cases, these are not even plausible as necessary conditions” (Laudan 1983, 123, my emphasis). But this suggests that *some* candidates are plausible necessary conditions. Furthermore, when Laudan (1983, 118) states that a demarcation criterion “must be an adequate explication of our ordinary ways of partitioning science from non-science”, this seems to presuppose that there is a sufficient condition for scientific theories after all, if only by enumeration of what we ordinarily call ‘science’. Thus, Laudan’s argument suggests that there is a criterion that provides a necessary condition and a (non-equivalent) sufficient condition for scientific theories. It may be that this criterion is very weak, leaving many cases c undecided ($\neg\varphi(c) \wedge \psi(c)$). But without the demand that any condition must be both necessary and sufficient, such a criterion can already decide important cases and furthermore provide a starting point for stronger criteria.

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