

Assessment 6 Theory Change and Scientific Progress

Guide to Responding

Describing an account of theory change and scientific progress involves specifying, in an abstract way, when various kinds of response to scientific challenges are or are not rational, and then providing examples that illustrate these various responses and the account's verdicts about the rationality of each response. (A response is *rational* according to such an account if the account entails that there are good reasons for such a response, and a response is *not rational* according to such an account if the account entails that there are not good reasons for such a response.)

Consider, for example, a partial description of a falsificationist account of theory change and scientific progress:

According to falsificationism, if a piece of scientific evidence conflicts with a scientific hypothesis and, in response to that conflict, scientists reject the theoretical claim as false, then the response is *rational*, because there is a contradiction between the evidence and the theoretical claim, and no contradiction can be true.

Similarly, according to falsificationism, if a piece of scientific evidence is consistent with a scientific hypothesis and, in response to that consistency, scientists accept the hypothesis as true, then the response is *not rational*, because (at least according to falsificationism) the problem of induction shows that no evidence ever provides support for the truth of a scientific hypothesis.

[Note that the description of this account is incomplete, because it does not provide illustrative examples.]

Assessing the extent to which an account of theory change and scientific progress shows that theory change in a given time period was rational involves listing the major challenges to theories during that time period; describing the response of scientists to those challenges; for each response, defending a thesis regarding whether that response was rational according to the account of theory change and scientific progress; and, finally, defending an overall verdict regarding the account of theory change and scientific progress.

If, for most of the responses in the given time period, the account of theory change entails that those responses were *rational*, then the account provides a very good explanation of the rationality of theory change during that time period. If, for most of the responses in the given time period, the account of theory change entails that those responses were *not rational*, then the account provides a very poor explanation of the rationality of theory change during that time period.

