

Comprehensibility rather than Beauty

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Abstract

Most scientists and philosophers of science recognize that, when it comes to accepting and rejecting theories in science, considerations that have to do with simplicity, unity, symmetry, elegance, beauty or explanatory power have an important role to play, in addition to empirical considerations. Until recently, however, no one has been able to give a satisfactory account of what simplicity (etc.) is, or how giving preference to simple theories is to be justified. But in the last few years, two different but related accounts have appeared, both of which address the above issues. On the one hand, James McAllister has argued that aesthetic criteria in science reflect scientists' judgements about what kind of theory is most likely to be empirically successful, based on the relative empirical success and failure of different kinds of theories in the past. Scientists employ what McAllister dubs "the aesthetic induction". On the other hand, I have argued that we need to see science as making a hierarchy of metaphysical assumptions about the comprehensibility and knowability of the universe, these assumptions asserting less and less as one ascends the hierarchy. One of the more substantial of these assumptions is that the universe is physically comprehensible. The key non-empirical feature a body of fundamental theories in physics must possess to be acceptable is unity. The better such a body of theory exemplifies the metaphysical thesis that the universe is physically comprehensible, in the sense that it has a unified dynamic structure, so the more acceptable such a body of theory is, from this standpoint. This affects not just theoretical physics, but the whole of natural science. In this paper I compare and contrast, and try to assess impartially the relative merits of, these two views.

Keywords: Comprehensibility, beauty, simplicity, unity, explanation, symmetry, physics, metaphysics, physical theory, theory structure, methodology, scientific method, aesthetics in science

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