

A paradox of underdetermination

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Abstract. One way of trying to justify the thesis of the underdetermination of scientific theories is by actual examples. In this paper, I present a paradox which arises from trying to justify the thesis in this way.

The thesis that scientific theories are underdetermined by the evidence is the thesis that, for any scientific theory, there could be a rival theory which copes equally well with the evidence. This thesis is a challenge to the idea that our best scientific theories reveal the nature of reality; but it needs to be justified first. Below I present a paradox that concerns one way of trying to justify it.¹

This way involves appealing to actual examples in science. An advantage of this way is that, if successful, there would be no reason to regard the thesis as a mere philosopher's speculation. Rather it would be justified by what actually happens in science.

However, there is an obstacle to justifying the thesis by actual examples. The obstacle I have in mind is not a shortage of examples. Let us assume, for the sake of argument, that we are "flooded" with actual examples, each involving a scientific theory which copes with the evidence and a rival theory that copes equally well. On the basis of these many examples, we have reason to think it overwhelmingly likely that the underdetermination thesis is true.

But given the thesis and this justification by examples, we can infer that it is possible to formulate a rival thesis that copes equally well with the examples. For

¹ To the best of my knowledge, this paradox is not already in the literature. Park 2009, Stanford 2017, and Turnbull 2017 provide literature reviews.

science can itself be subject to scientific study – study by methods such as observation, generalization, the testing of hypotheses, and so forth – and the underdetermination thesis, when justified in this way, is just a scientific theory that copes with evidence from the study of science. It therefore applies to itself. However, if it is possible for us to formulate a rival thesis that copes equally well with the many examples, then maybe that thesis is true and not the underdetermination thesis. Thus our many examples give us reason to think that the underdetermination thesis has at best a 50% chance of being true.

So it seems we have a paradox: assuming a suitably large and varied supply of examples, we have grounds for concluding that the underdetermination thesis is overwhelmingly likely to be true and that it has at best a 50% chance of being true.

References

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