

## Against novel predictions, for virtuous theories

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Contrary to strong and persistent philosophical intuitions (Popper 1959, Lakatos 1978, Maher 1988, Lipton 1991, Douglas 2009), historical research on some of the most cherished novel predictions has failed to unearth any evidence for the view that temporally successful predictions are valued particularly highly in the scientific community in the appraisal of theories (Worrall 1989, Brush 1989, Scerri & Worrall 2001). As Worrall has argued, however, scientists should (and allegedly do) appreciate *use-novel* evidence, i.e. evidence that hasn't been used in the construction of the theory in question. The intuition driving this notion is clear enough: a theory that accommodates a given piece of evidence in an ad hoc way should not receive much credit for it.

Worrall claims that the question of whether or not a given piece of evidence is use-novel can be determined independently of the particular construction decisions taken by particular scientists (contra e.g. Hudson 2007). All that matters is whether or not a theory's parameters *need* to be fixed by reference to certain facts in order to predict those facts. Thus, Einstein did not need to fix any parameters in his theory in order to predict the notorious advance of Mercury's perihelion—independently of Einstein's likely desires to explain this phenomenon (Worrall 1985). Another way in which Worrall has put the same point is that a theory should entail the facts in a 'natural' way. However not all theories accomplish such feat. Some theories' parameters need to be fixed indeed in order to render the respective theories empirically adequate (Worrall 2002, 2005). Not all of those theories Worrall would want to deem ad hoc. Rather, Worrall thinks that parameter-fixing in reference to certain evidence is permissible *iff* the adjustment leads to 'independently testable' *and* 'observationally verified' predictions (Worrall 2005).

As I shall argue in the first part of this paper, the criterion of independent support adds a peculiar time-dimension to ad hoc accommodations: a modification of a theory may be ad hoc at one point in time, but cease to be ad hoc at a later point in time, if we find independent support for this modification. But how long do we have to wait until we can justifiably deem a theory ad hoc? Intuitively ad hoc assumptions do not have such a time dimension: we would like to say at least in some cases that a theory is or is not ad hoc *simpliciter*. Dropping the requirement of 'observational verification' not only collapses Worrall's criterion for ad hoc-ness with Popper's, but it also merely defers the problem (rather than solving it). As many have pointed out (Grunbaum 1959, Janssen 2002), even the clearest examples of ad hoc-ness, such as Lorentz's contraction hypothesis, did produce independently testable predictions.

In the second part of the paper, I will focus on the more underdeveloped (and largely implicit) part of Worrall's account, which I think holds key for our understanding of ad hoc-ness: the 'natural' entailment of evidence by a theory. Taking my lead from Janssen (2002)'s study comparing Einstein's special theory of relativity and Lorentz' ether theory, I will argue that a theory is 'natural' if it gives a *common* justification for the principles it invokes for various phenomenological realms. Accordingly, a theory is rendered ad hoc, if this common justification is compromised in the attempt to incorporate new phenomena. On the account proposed in this paper, predictions—whether temporal or use-novel—play no exceptional part for the appraisal of theories.