Studies in History and Philosophy of Science xxx (2017) 1–10

Contents lists available at ScienceDirect

Studies in History and Philosophy of Science

journal homepage: www.elsevier.com/locate/shpsa

Defending the selective confirmation strategy

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ARTICLE INFO

Article history:
Received 22 June 2016
Received in revised form
6 May 2017
Available online xxx

Keywords:
Scientific realism
Selective realism
Pessimistic meta-induction
Social epistemology

ABSTRACT

Most scientific realists today in one way or another confine the object of their commitment to certain components of a successful theory and thereby seek to make realism compatible with the history of theory change. Kyle Stanford calls this move by realists *the strategy of selective confirmation* and raises a challenge against its contemporary, reliable applicability. In this paper, I critically examine Stanford's inductive argument that is based on past scientists' failures to identify the confirmed components of their contemporary theories. I argue that our ability to make such identification should be evaluated based on the performance of the scientific community as a whole rather than that of individual scientists and that Stanford's challenge fails to raise a serious concern because it focuses solely on individual scientists' judgments, which are either made before the scientific community has reached a consensus or about the value of the posit as a locus for further research rather than its confirmed status.

1. Introduction

The so-called *pessimistic meta-induction* is one of the major challenges against scientific realism (Laudan, 1981). It presents a list of theoretical entities that were once posited in a successful theory but discarded in a later theory change, such as the celestial sphere, phlogiston, caloric, and ether in the 19th century theory of light and electromagnetism. Since those theoretical entities did not have referents, the argument goes, one can hardly say that the theories in which they were posited were even approximately true. These historical cases serve either as a basis for an inductive argument that a currently successful theory may also turn out to be false in the future, or as counter-evidence to the so-called *no-miracles argument*, which claims that the only way to explain a theory's success without appealing to miracles is to infer its (approximate) truth. If one applies that inference to a current successful theory (e.g., the currently accepted electromagnetic theory) and infers its truth, that will imply the falsity of its predecessor theory (the wave theory of light as conceived by Fresnel) despite its empirical success, since those theories disagree with each other in some respects (such as the posit of mechanical medium for light propagation). Hence, one may conclude, there must be something wrong with inferring a theory's truth from its success.

Faced with this difficulty, many realists felt it necessary to refine their position. The first step toward refinement was to specify the kind of 'success' that should elicit a realist commitment. Thus, they narrowed down the notion of 'success' to 'novel predictive success' (e.g., Leplin, 1997; Worrall, 1989). That way, they argue, they could considerably shorten Laudan's list of 'successful, but false theories' because many of them were not successful in this stricter sense. However, some items in the list, such as the luminiferous ether, still count as successful even in this narrower sense and remain counter-evidence. Thus, many realists took the second step for refinement, which Kyle Stanford calls *the strategy of selective confirmation* (Stanford, 2006), and argued that those successful theories were not outright false but contained some true components that brought about the successes.

According to Stanford's characterization, the realists who take the selective confirmation strategy "defend only some *parts* or *components* of past theories as responsible for their success, while abandoning others as idle, merely presuppositional, or otherwise not involved in the empirical successes those theories managed to achieve, and therefore never genuinely confirmed by those successes in the first place" (2006, p. 164, original emphasis). Philip Kitcher (1993), for example, categorizes theoretical posits into *working posits* and *presuppositional posits* and endorses realistic commitment only to the former type of posits (p. 149). Stathis Psillos (1999), on the other hand, distinguishes *the truth-like constituents* of a theory, which fueled the theory's empirical success, from *the idle ones*, which made no such contributions; then, he claims that scientists themselves routinely make such differentiation, and those parts that they regarded as having evidential support tend to be retained through theory change (pp. 108–114). Though Stanford mentions these two particular realists as typically

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http://dx.doi.org/10.1016/j.shpsa.2017.07.001
0039-3681/

employing the strategy, the description of the strategy seems to apply to other versions of realism (often collectively called *selective realism*) as well (e.g., Cartwright, 1983; Chakravartty, 2007; Egg, 2016; Giere, 1988; Hacking, 1983; Harker, 2013; Peters, 2014; Saatsi, 2005; Worrall, 1989).

Stanford (2006) challenges the selective confirmation strategy, pointing to a few historical cases in which scientists were committed to a certain posit of their contemporary theory that is now regarded as false. He claims that these cases call into question whether we can reliably identify the true/confirmed components of contemporary successful theories, and thus, the selective confirmation strategy provides no refuge for scientific realists.

The aim of this paper is to defend the strategy from this challenge, which I call *the no refuge argument*. I claim that given the social nature of scientific inquiry, in which researchers pursue different approaches or hypotheses and subject their views to criticism, one needs to consider the reliability of the community-level judgments rather than those by individual researchers in order to examine the reliable detectability of confirmed theoretical components, and that the no refuge argument fails to pay attention to those community-level judgments. In particular, I claim that the cases of misjudgments that Stanford cites in support of the argument are made either (a.) before the scientific community at the time reached a consensus on the theory or the particular hypothesis in question or (b.) about the usefulness of that component as a working hypothesis rather than on its confirmed status. I argue that one cannot show the unreliability of the community-level judgments based on those cases, and thus, the no refuge argument fails to raise a serious challenge against the selective confirmation strategy.

This is not to say that selective realism is free from concerns.[1] As we will see in the next section, Stanford himself raises two more arguments against it. Timothy Lyons (2006) develops another argument against Psillos' and other versions of selective realism. Hasok Chang (2002) also objects to Psillos' analysis of caloric theory and questions the plausibility of what Chang calls 'preservative realism' in general. Thus, the argument developed below is only intended to be a defense of selective realism from a particular challenge (i.e., the no refuge argument) with particular grounds. The rationale for focusing on the no refuge argument is that unlike the other challenges against selective realism, it has not received much attention in the literature despite its possibly broad scope and its significance to the current scientific realism debate. In what follows, I first formulate Stanford's no refuge argument and clarify its characteristics (Section 2). Then, I present my objection to the argument (Section 3), and finally, I consider some possible problems with my objection to the no refuge argument (Section 4).

2. The no refuge argument

2.1. Is reliable detection of the confirmed components possible?

The central tenet of selective realism may be summarized as follows: successful theories contain (approximately) true components that are responsible for their empirical success, and the belief in such components is less vulnerable to the challenge of the pessimistic meta-induction, for they are typically retained through theory changes. Given this response to the pessimistic meta-induction,[2] Stanford now questions whether we can *reliably* identify such true components of our *contemporary* successful theories and argues that there are historical records that suggest our inability to make such judgments reliably.

For example, Stanford argues, the 19th-century physicists thought that the existence of *some mechanical medium* is essential for optical and electromagnetic propagation, even if they were not committed to *a specific model of the ether* present at the time. To support this claim, he cites a passage from James Clerk Maxwell's *A Treatise on Electricity and Magnetism*, where he says:

> [W]henever energy is transmitted from one body to another in time, there must be a medium or substance in which the energy exists after it leaves one body and before it reaches the other, for energy, as Torricelli remarked, 'is a quintessence of so subtle a nature that it cannot be contained in any vessel except the inmost substance of material things.' (Maxwell, 1873, p. 438)

From this passage, Stanford argues, Maxwell seems to have believed that the existence of some mechanical medium was required for the success of the wave theory of optics and electromagnetism.

The second example of misjudgment that Stanford points to is August Weismann's commitment to what Stanford calls *the hypothesis of germinal specificity* (i.e., a hypothesis that "the nuclei of different cells *must* contain different constituent elements of the organism's hereditary material" (Stanford, 2006, p. 111; original emphasis)). Contrary to the current view, he believed that the hypothesis was essential for the explanation of ontogenetic differentiation of cells constituting different body parts of an organism. Finally, Stanford points to Antoine Lavoisier's belief in 'the matter of heat and fire' as an essential part of the explanation of various thermal phenomena (Stanford, 2006, p. 154).

Based on these failures by Maxwell, Weismann, and Lavoisier to identify the true components of their contemporary theory, Stanford claims that it is questionable whether, as Psillos argues, scientists themselves can identify the genuinely confirmed parts of their successful theories, or, as Kitcher recommends, distinguish working posits of those theories from presuppositional ones. Thus, Stanford argues[3]:

> [T]he strategy of selective confirmation risks leaving us unable to trust our ability to determine, at the time a theory is a going concern, which parts, features, or aspects are *actually required* for the success of that theory. Accordingly, without some *prospectively applicable* and *historically reliable* criterion for distinguishing idle and/or genuinely confirmed parts of our theories from others, the strategy of selective confirmation offers no refuge for the scientific realist. (2006, p. 169; original emphasis)

Let us call this inductive argument against the reliability of our judgment concerning the genuinely confirmed parts of our contemporary theories the *no refuge argument* (NRA, hereafter) and formulate it as follows:

[1] Nor do I mean that the defense of selective realism here can show, even if it is successful, the approximate truth of the source of a theory's success *in a way that is convincing to anti-realists*. For, even if realists can address the problem of the pessimistic meta-induction (old and new (Stanford, 2006)) and the no refuge argument, a disagreement between realists and anti-realists remains concerning the plausibility of underdetermination. The purpose of this paper is only to address the former challenges and not to resolve the latter disagreement.

[2] Actually, as Chakravartty (2008) and Psillos (Psillos, Saatsi, Winther, & Stanford, 2009) note, and as Stanford himself (2006, p.159, p. 181) seems to be aware of, the strategy of selective confirmation can address not only the pessimistic meta-induction but Stanford's *new induction* as well (Stanford, 2006). Thus, the no refuge argument is meant to serve as a backup argument for his new induction.

[3] In the following passage, Stanford's claim on the necessity of a prospectively applicable criterion is based on another argument, which I call the Whiggish convergence argument. (I will discuss this later).

Please cite this article in press as: Onishi, Y., Defending the selective confirmation strategy, Studies in History and Philosophy of Science (2017), http://dx.doi.org/10.1016/j.shpsa.2017.07.001