

Philosophy of science in practice and weak scientism together apart (*Preprint*)

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Abstract. The term ‘scientism’ has not attracted consensus about its meaning or about its scope of application. In this paper, we consider Mizrahi’s suggestion to distinguish ‘Strong’ and ‘Weak’ scientism, and the consequences this distinction may have for philosophical methodology. While we side with Mizrahi that his definitions help advance the debate, by avoiding verbal dispute and focussing on questions of method, we also have concerns about his proposal as it defends a hierarchy of knowledge production. Mizrahi’s position is that Weak Scientism should be adopted, stating that “of all the knowledge we have, scientific knowledge is the *best* knowledge”. This version of scientism, however, has consequences for philosophical methodology. In particular, if one conceives of philosophy as an a priori discipline and holds Weak Scientism, the introduction of empirical methods in philosophy may threaten its very essence or soul. In this chapter, we will defend the move to adopt empirical methods in philosophy and argue that, rather than threatening its essence or soul, these methods put philosophy in a better position to contribute to knowledge production, an endeavour shared with the sciences, and in a very interdisciplinary spirit. Our point of disagreement with Mizrahi is that we should avoid any hierarchy of knowledge, and instead focus on what each perspective -- scientific, philosophical, historical, or other -- can contribute to understanding phenomena.

## 1. Introduction

Scientism is commonly associated with the idea that scientific method has almost no limits and can successfully be applied to all domains, providing explanation for everything in the world (Schults 2002). Despite its wide range of definitions<sup>1</sup>, the term is often used pejoratively by some philosophers (Mizrahi 2017a) as a response to scientists who assume that philosophy can be rather sterile (Pigliucci 2002, p. 115) or a waste of time (Weinberg 1992), and therefore is no longer useful (Hawking and Mlodinow 2010). Defenders of scientism have adopted it half-wittingly without a very well-articulated argumentation in its

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<sup>1</sup> For others definitions and positions about scientism see Wilson (1999), Olafson (2001), Stenmark (2001), Margolis (2003), Haack ([2007]2015), Olson (2008), Rosenberg (2011), and for a conceptual map see Peels (2018).

favour, as pointed out by Woudenberg et al (2018, p. 2): “it is a view that appears to be more ‘in the air’ than pinned down on paper as a philosophical position”. In order to properly assess this debate and avoid verbal disputes, Mizrahi (2017a) develops an epistemological thesis of scientism that distinguishes between *Strong Scientism* and *Weak Scientism*.

According to this account, *Strong scientism* assumes that “of all the knowledge we have, scientific knowledge is the *only* ‘real knowledge’” (p. 353), while *Weak scientism* assumes that “of all the knowledge we have, scientific knowledge is the *best* knowledge” (p. 354). The one addressed by Mizrahi as having a significant impact in philosophy is the latter. His argument suggests that scientific knowledge is quantitatively and qualitatively better than non-scientific knowledge because it produces more research outputs and impact, as it is more successful in its instruments and in developing predictive explanations (Mizrahi 2017b, 2018). That being established, he also suggests “that the introduction of methods from data science into logic (Mizrahi 2019) and philosophy (Mizrahi 2018b, 48) might bring to logic and philosophy the sort of success enjoyed by the sciences” (Mizrahi 2019a, p. 10).

More recently, in “The scientism debate: a battle for the soul of philosophy”, Mizrahi (2019b) argues that the question whether philosophy can reach the ‘success enjoyed by the sciences’ gravitates around two fundamental contexts: philosophy as a field of study, and philosophy as a field of inquiry. He develops a bibliographic survey and regression correlation analysis with data mined from JSTOR Data for Research, in order to test the following hypothesis:

- H1: many philosophers find scientism intimidating because they see it as a threat to the future of philosophy as a major in college and universities. If this hypothesis is true, philosophers would feel endangered because students would choose STEM majors instead of philosophy. And,
- H2: many philosophers find scientism threatening because they see it as a danger to the soul or essence of philosophy as an *a priori* discipline, which is in essence how Analytic Philosophy is typically conceived. If this hypothesis is true, then philosophers would feel threatened when traditional methods of philosophical investigation lose ground to empirical methods.

His results show a very weak positive correlation for H1, meaning that there is a “weak positive correlation between the number of Philosophy and Religious Studies Bachelor’s degrees conferred by postsecondary institutions in the United States and the number of

publications in the Philosophy subject category on JSTOR that contain the term “scientism” (ibid. p.8). While for H2, there is a “correlation between the number of philosophy publications that contain the term “scientism” and those that contain the phrase “experimental philosophy”” (ibid, p.9). The results point to the existence of a methodological shift suggesting that philosophy is stepping “away from purely *a priori* methods of investigation (so-called “armchair philosophy”) toward *a posteriori* or empirical method of investigation (so-called “experimental philosophy”)” (Mizrahi 2019, p. 10). On this account, philosophy would be subjected to the empirical methods of observation and experimentation that are widely used in science, complying with what is called *Weak Scientism*. However, it is worthy to highlight that even Mizrahi (2019, p.10) acknowledges that these results cannot be explicitly interpreted as good or bad for philosophy, even though he does not elaborate on why is it so.

In our view, *Strong* and *Weak Scientism* theses do possess stronger epistemological appeal than previous definitions offered in the literature as they avoid verbal disputes, persuasive and question begging definitions (see Mizrahi 2017a). We also side with Mizrahi that *Weak Scientism* is, out of the two, the most interesting option to consider. However, we will show that *Weak Scientism*, as presented by Mizrahi, might be misleading because

- (i) it obscures the fact that ‘empirical philosophy’ is in fact interdisciplinary (as argued by Bishop 2019) and inherently methodologically diverse (our specific point); and
- (ii) it introduces a hierarchy of knowledge production (see Mizrahi 2018b, 2018c responses to Wills 2018a, 2018b) reminiscent of positivism and neo-positivism.

To develop our arguments, we will consider Philosophy of Science in Practice (PSP) as a field of inquiry, developed within philosophy of science. Our goal in this chapter is to show that endorsing *Weak Scientism together with* a sceptical attitude towards the adoption of empirical methods in philosophy may undermine flourishing philosophical approaches such as philosophy of science in practice and socially engaged philosophy. This is because *Weak Scientism*, if taken literally and as not including philosophy, is unable to recognize the inherent interdisciplinary character and methodological diversity of PSP investigations. Thus, instead of focusing on whether and how philosophy may be threatened by the adoption of methods, the question to ask is what *else* can we learn from empirical and empirically-informed philosophy, that armchair methods *alone* cannot achieve. This, we argue, is the value of interdisciplinarity and of methodological diversity of PSP. As a consequence, the

goal should not be to establish rigid hierarchies of knowledge as Mizrahi proposes, but to figure out which method is best suited to the research questions and goals one sets.

## 2. Weak scientism and methodological diversity

According to Mizrahi, H2 -- namely that many philosophers find scientism threatening because they see it as a threat to the soul or essence of philosophy as an *a priori* discipline -- is confirmed by the existence of a positive correlation between the number of publications mentioning the terms 'experimental philosophy' and 'scientism'. He says:

This strong positive correlation between the number of philosophy publications in which the term “scientism” occurs and those in which the phrase “experimental philosophy” occurs is what we would expect to find if H2 were true. As mentioned above, if H2 is true, we would expect philosophers to feel more threatened by scientism when they think that the traditional methods of philosophical investigation (such as the method of case) begin to lose ground to empirical methods of investigation. This positive correlation and the result of a linear regression analysis, which indicates that the number of “experimental philosophy” publications predicts “scientism” publications in Philosophy, suggest a link between the introduction of empirical methods into philosophy and concerns about scientism among philosophers that is worthy of further investigation, or so I think (Mizrahi 2019, p. 9)

In a commentary to Mizrahi, Bishop (2019) points to two issues in this analysis. First, that such correlation is not enough to conclude that these publications focus on empirical philosophy and that scientism has positive or negative connotations (also agreed by Mizrahi *ibid*); both conclusions would require a finer grained examination of those articles. Second, Bishop brings attention to the misleading aspect of calling the adoption of empirical methods in philosophy “scientism”, when it should be considered an instance of interdisciplinarity. We broadly agree with Bishop's concerns, and therefore will not focus on those aspects, as they are already addressed in his work. Instead, we wish to follow up on Bishop's arguments, and point out that the introduction of empirical and scientific methods into philosophical investigations does not just enrich philosophy with interdisciplinarity aspects, but also introduces an inherent methodological diversity, which remains implicit when using the notion of ‘empirical philosophy’. Thus, in the next section, we introduce the ‘practice turn’ in philosophy of science to show that methodological diversity, and the adoption of empirical

methods, enriches philosophical methodology, rather than threatening its essence, against Mizrahi's H2.

## 2.1 The practice turn in philosophy of science

Philosophy of science, as a field of inquiry, focuses on the nature and production of scientific knowledge through ontological, epistemological, methodological and normative investigations. According to the reconstruction of Hans Radder, until the 1970s, philosophy of science was a relatively small field (with a few journals, special editions, and monographic works), usually characterized as general philosophy of science, having physics as the discipline that best represents the ideals of unification and reduction - the role model for all sciences (Radder 2012). After this period, the discussions about the limits of unification, together with new interesting foci in the cognitive sciences, pushed towards the development of a philosophy of special sciences (Fodor 1974, Schurz 2014). As a consequence, there was a fragmentation and subsequent specialization: journals focusing on specific scientific disciplines, topics and methods have increasingly emerged (Radder 2012). This 'speciation' of philosophy of science has been visible in the gradual inclusion of philosophy of biology and of the life sciences or philosophy of the social sciences and of economics as legitimate sub-fields and, more recently, of philosophy and methodology of medicine. On the one hand, philosophy of science has considerably broadened the scope of questions asked, going beyond the very classic themes of explanations, natural laws, (anti)realism, objectivity, methodology, ethics/value, demarcation and progress across the science, and also developed concepts, theories and methods that are tailored to specific scientific fields. On the other hand, such fragmentation and subsequent specialization have reduced its impact to the outside sphere of its practitioners, being even called as the 'Siberia of Philosophy' (Radder 2012). Despite its theoretical advances regarding the practices of science, traditional philosophy of science has aimed at an account of scientific knowledge in terms of a two-way relationship between world and knowledge (Boon 2017). Such philosophical analyses were mainly based on interpretations of already published theories and results, instead of engaging with real life practices run by scientists, thus allowing an analysis of the ongoing process of experimentation, data gathering, and so on. In the 1980's, the call for an analysis of science that would put the practice at the centre had been advocated not only in philosophy but also, and perhaps primarily, in some fringes of the history of science and in sociology of science. The main idea was that we should focus on the scientific *practice*, in its social, political,

material, and psychological dimensions (for a reconstruction of the practice turn, see Soler et al 2014).

Other arguments in favour of focussing on the distinct practices of science came from post-Kuhnian, naturalists and postmodernists (Radder 2012). Postkuhnians defended that science could not be understood only through an armchair perspective (see Bryson 2009), while naturalists questioned the distinction between philosophy and science arguing that, to understand scientific activities, such as observation or theoretical reasoning, one needs to engage with cognitive sciences. And lastly, the postmodernists have improved fundamental criticisms about a general epistemology of science, of universal theories of rationality and, understandable scientific methodologies (Radder 2012). Outside philosophy of science, pragmatists such as Charles Peirce and John Dewey, as well as the later Wittgenstein, have also dedicated attention to search truth and meanings through practices and instruments (see Stern 2003). Continental philosophical traditions have also highlighted the need to consider practices and experiences while they have also rejected positivists traditions that saw sciences as excessively privileged, having scientific progress as right (Ankeny et al 2011).

In the practice turn, social and historical studies of science (and technology) focused on scientific practices as products of human activity, while philosophy of science focused on the relations between scientific theories, and the world. However, philosophy of science was still isolated from the scientific practices *per se* and being developed mainly through armchair reflections (Ankeny et al 2011). Thus, if the goal was to understand and explore the methods and frameworks underlying scientific practices, both scopes were limited, not only because they neglected the perspectives and approaches important for a more complete picture of science, but also because they neglected the *processes*, or practices, that lead to scientific conclusions and scientific products (Ankeny et al 2011). Echoing such concerns, and to address them, Philosophy of Science in Practice started as a learned society in philosophy and as a professional venue to facilitate and foster debate.

Philosophy of Science in Practice, among other things, aims to account for scientific practices in various fields, and addresses questions such as: How is the construction of knowledge for epistemic uses possible? What methods are employed in such constructions? And what do methods and concepts tell us about the world? How are these practices value-laden? PSP aims at an understanding of science that avoids the belief that the objectivity of knowledge can be warranted by an account of knowledge-justification that eliminates the role of

scientists, but that also avoids a mere psychological and sociological interpretation of scientists' subjectivity (Boon 2017).

The Society for Philosophy of Science in Practice (SPSP) defines the term 'practice' as organized or regulated activities that aim to achieve certain goals (see e.g. Chang 2014). Thus, any investigation of practices should elucidate what kind of activities are associated with them and required for the generation of knowledge in a given domain. In this sense, PSP has the practices of science as its object of research.

## 2.2. Philosophy of Science in Practice is methodologically diverse

Philosophy of science in practice does not possess any general protocol or any specific methodology to apply in order to achieve its goals. The instruments used to investigate the practices of the sciences come from history, psychology, technology studies, sociology and so on (Boon 2017). These instruments include, but are not limited to, conceptual analysis, historical reconstruction and contextualization, analysis and consideration of cultural, social, political aspects, discourse analysis, formal methods, or ethnographic approaches. It is important to note that there is no hierarchy in this list of methods or clusters of methods – unlike what is suggested by weak scientism. The lack of a general methodological approach does not make PSP more or less valid as a whole, and for this reason does not squarely fit with any definition of scientism (weak or strong). The abovementioned methodological instruments, with their diversity, constitute a toolbox to achieve the goal of understanding various aspects of scientific practices. Instead of sticking to any rigid protocol, PSP takes advantage of a set or family of approaches from different fields, configuring what we would like to call *methodological diversity*. The challenge, then, is to map how these methodological processes might happen in this wide range of possibilities.

Attempting to organize such methodological diversity in the context of PSP, John Dupré, at the 3rd Biennial Conference for the European Philosophy of Science Association at the University of Exeter, 2011, has called attention to the duality of approaches and applications depicted by *philosophy of science-in-practice* and *philosophy-of-science in practice* (Boumans & Leonelli 2013). The first one is the philosophy that analyzes science being made, the daily activities associated with scientific research, in this approach, philosophers do not necessarily collaborate with scientists but they can use empirical methods from history or sociology (Kosolowski 2012, Boumans & Leonelli 2013). The second one, is the philosophy that engages with the scientific research through the interaction with scientists about

philosophical problems and/or common ground issues. This approach does not require that philosophers engage with empirical methods, even though this might occur, the emphasis is to recognize shared problems in philosophy and science (Kosolovsky 2012, Boumans & Leonelli 2013). A socially engaged philosophy is also part of such methodological diversity. Interesting work has been developed by initiatives such the Toolbox Project, at the SRPoiSE - Socially Relevant Philosophy of/in Science and Engineering (<http://srpoise.org>); a *Socially-Engaged Philosophy* organized by Martin Kush at University of Vienna; and *The Geography of Philosophy* ([www.geographyofphilosophy.com](http://www.geographyofphilosophy.com)) by Edouard Machery, Stephen Stich and H. Clark Barret. Recently, Laplane *et al* (2019) have also called attention to the important role and impact philosophy can have in science, although some scientists still conceive philosophy as being antagonistic to science. Drawing on three examples from contemporary life sciences (i.e. cognitive sciences, immunology, and stem cell research), these authors show that philosophical contributions to science can be of at least four kinds: clarification of scientific concepts, critical assessment of scientific assumptions and methods, development of new concepts and theories, and fostering dialogue between distinct fields. Laplane *et al* (2019) article fosters this debate by arguing that modern science can benefit from philosophy, and that this close integration between the fields can enhance the vitality of science. This specific approach stems from PSP and is called Philosophy *in* Science (Pradeu *et al* 2021).

According to Tress *et al* (2005), interdisciplinarity can create a unique body of knowledge that merges from disciplinary fields. Elaborating on Tress *et al* (2005), Poliseli (2018) also note that in the interdisciplinary work of PSP, philosophical and scientific knowledge are *co*-produced. In such interplay of empirical and philosophical methods with scientific methods there is no hierarchy of methods for knowledge production – unlike what is suggested by weak scientism and by accredited methodologies such as evidence based medicine, that are quite reminiscent of positivist approaches to science and knowledge. This can be illustrated through many examples in philosophy of science in practice.

In the following, we select two examples from our own work, because they closely follow the spirit and intentions of PSP to understand and make sense of scientific practices, and to actively contribute to advancing the scientific process. While they may seem *prima facie* very similar methodologically, the first case (but not the second) uses ethnographic methods, and the second (and to a lesser extent the first) uses conceptual analysis (informed by the practice of science) in order to formulate explicit recommendations for public health. In these examples, philosophers can use philosophical tools to tackle scientific problems and



therefore, produce scientific knowledge (Chang 1999), but can also address philosophical problems using lessons taken from case studies in science (Malaterre et al 2019).

Our first example is taken from Poliseli (2018), who elaborates an account of how a philosopher can actively contribute to scientific practice, and at the same time produce philosophical knowledge. Poliseli (2018) presents a case in which a philosopher together with an ecologist can produce a set of heuristics that is built on a combination of philosophical and ecological knowledge. The combination and synergy of methods from philosophy and ecology was carried out in view of studying mechanistic model-building and assessing theories of scientific understanding. This unique body of heuristics can be analysed by both scientists and philosophers, through scientific methods (e.g. model-building) and traditional philosophical conceptual analysis (e.g. by engaging with concepts of explanation and understanding) (see Poliseli 2020). Our second example is taken from Kelly and Russo (2017), who aim to develop an account of ‘mixed mechanisms’ in which philosophical analyses of ‘mechanisms’ are combined with social science approaches to health and disease. In the philosophical analysis, they advance the view that a concept of ‘mixed mechanism’ can capture the role of both biological and social factors in the aetiology and development of health and disease. The study of mixed mechanisms, however, cannot be reduced to biochemistry but needs social science in a fundamental manner. This combination of methods leads to developing a concept of ‘lifeworld’ that (i) captures the lived experience of individuals and groups, (ii) can be operationalized and studied in quantitative and qualitative studies, and (iii) can be put to use in the context of public health interventions.

While we acknowledge and praise the methodological diversity and the engagement of the practice typical of PSP studies, we should also mention that, as yet, no proper discussion of how methods of the social science can be really combined with typical philosophical methods exists. As a consequence, PSP is still in need of further development, and notably about developing methodological foundations explaining how philosophy can appropriately make use of ethnography and of empirical case studies. For instance, the role of case studies in philosophy (of science) has sparked debate (Chang 2011, Illari & Russo 2014, Mizrahi 2020), but other than mention problematic aspects of this practice in philosophical analysis, no positive solution has been offered, and yet case studies are routinely used in History and Philosophy of Science, Philosophy of Science in Practice and in other subfields too. This is to say that, while we firmly side with PSP for its interdisciplinary character and its

methodological diversity, we also acknowledge that potential problems identified by Mizrahi in applying Weak Scientism to philosophy are not entirely resolved.

Now, returning to Mizrahi's defense of Weak Scientism and how philosophers understand it as a threat to the soul of philosophy, he says:

As far as research is concerned, scientism is perceived as a threat to the sort of research that philosophers typically do because it advocates the use of empirical methods of observation, experimentation, and the like, whereas philosophers are typically content with armchair reflections'. [...] Many philosophers seem to think that scientism poses a threat to them as researchers because it somehow implies that philosophy has no valuable contributions to make to the advancement of knowledge unless it adopts the empirical methods of the sciences. For this reason, some philosophers find it necessary to defend the traditional methods of philosophy against any attempt to introduce empirical methods into philosophy (Mizrahi 2019, p.1)

In our view, the above-mentioned PSP examples (as well as many others), do not fall under the umbrella of scientism, because their philosophical underpinnings are not dictated by the scientific methods. Instead, philosophical questions motivate the gathering of data of different sorts, to be further substantiated in the analysis of scientific practices. Any armchair reflection could not obtain results at the conceptual, epistemological, methodological, or normative level as is the case in philosophy of science-in-practice or philosophy-of-science in practice. In this sense, the absence of a 'coded' methodology opens up to a multitude of opportunities, precisely for the reason that there is no such thing as a 'fixed' or standard univocal way of determining the contents of knowledge production.

In our reading, *Weak Scientism* is accompanied with a hierarchy of methods for knowledge production, and 'a priori' methods sit at the very top of a pyramid and 'a posteriori' or empirical methods sit at the very bottom of it. Instead, Philosophy of Science in Practice as a field of inquiry takes advantage of methodological diversity, with no strict or rigid hierarchy associated to it. Granted, for any given research question we may come up with an ordered preference of methods, likely to deliver more or less solid results, but such ordered preferences are very local, and in no way universal. This inherent methodological diversity, in turn, calls for practices that are ipso facto collaborative and collegial. As it often happens in PSP circles, scholars from different perspectives come to collaborate on similar problems,

in order to produce and generate knowledge that would not otherwise be generated by using a single disciplinary approach (for philosophy of research team collaboration see Bammer 2013, Andersen 2016, Macleod et al 2019). The same goes for a philosopher delving into interdisciplinarity practices because they use both traditional philosophical (armchair philosophy) but also some kind of empirical method, or empirically-informed approach.

Thus, PSP constitutes an excellent example of how one could hold Weak Scientism, *without* subscribing to any hierarchy of methods for knowledge production; in fact, both philosophical and scientific knowledge are produced in accordance to ‘traditional’ *and* empirically-informed philosophical analysis. In a nutshell, there is no better knowledge, only knowledge that produced by methods that are more or less suited to explain a certain type of phenomenon or other.

### 3. Conclusion

In this chapter we have tried to explore some challenges posed by the concept of *Weak Scientism*, in particular as a thesis that may threaten the future of philosophy (of science). We have shown that the introduction of empirical methods in philosophy does not put philosophy under threat of losing its essence of distinct a priori character. Instead, we take the inherent interdisciplinarity and methodological diversity of empirically-oriented method as an enrichment of the toolbox of philosophers. In that sense, there is no reason to see philosophy outside the scope of Weak Scientism, or in competition with the sciences. There are flourishing philosophical approaches such as philosophy of science in practice and socially engaged philosophy that are inherently interdisciplinary and methodologically diverse, and their contribution to studying scientific problems ought to fall under a qualified version of *Weak Scientism* too, qua approaches that aim at producing valid knowledge. In particular, our qualification of *Weak Scientism* is that it should not entail a hierarchy of knowledge. As we have tried to defend here, the question is not about which knowledge is best, but which knowledge better explains their targeted goal, using appropriate tools, of any kind.

Our positive suggestion is that, instead of focusing on how philosophy is threatened (or not) by scientific methods, the question should be what *else* can we learn from empirical and empirically-informed philosophy, that armchair methods *alone* cannot suffice to achieve. This, we argue, is the value of interdisciplinarity and of methodological diversity: Not to establish hierarchies, but to figure out which method is best suited to the research questions and goals one sets.

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