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Why Everything You Think You Know about Scientism is Probably Wrong

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I would like to thank Renia Gasparatou, Philip Goff, and Andreas Vrahimis for contributing to the book symposium on *For and Against Scientism: Science, Methodology, and the Future of Philosophy* (London: Rowman & Littlefield, 2022). I am grateful to James Collier for hosting this book symposium on the *Social Epistemology Review and Reply Collective*.

In what follows, I will reply to Gasparatou and Vrahimis's contributions to this book symposium.[1] Before I do so, I will summarize what I take to be their main arguments against my conception of scientism. Briefly, my conception of scientism runs along the weak and broad lines of epistemological scientism (Mizrahi 2022a, 12). More specifically, Weak Scientism is the view that scientific knowledge is the *best* knowledge (or some other epistemic good, such as justified belief) we have. Weak Scientism is a weaker version of epistemological scientism than Strong Scientism, which is the view that scientific knowledge is the *only* knowledge we have. According to Weak Scientism, while non-scientific disciplines do produce knowledge, scientific disciplines produce knowledge that is superior—both quantitatively (in terms of research output and research impact) and qualitatively (in terms of explanatory, predictive, and instrumental success)—to non-scientific knowledge (Mizrahi 2017, 354; 2022a, 6–7; 2023, 41).

1. Reply to Gasparatou

In Mizrahi (2017, 351–353), (2022a, 3–4), and (2023, 39–41), I argue that the term "scientism" should remain neutral. This is because pejorative conceptions of scientism amount to persuasive definitions of the term "scientism," beg the question against anyone who is inclined to take a scientistic stance, and turn the scientism debate in academic philosophy into a mere verbal dispute. Other parties to the scientism debate in academic philosophy agree. For example, van Woudenberg et al. (2018, 2) write that "No one will accept a [pejorative] notion of 'scientism' as an adequate characterization of their own views, as no one will think that their deference to science is *exaggerated*, or their readiness to accept claims made by the sciences is *excessive*" (original emphasis).

By contrast, Gasparatou takes issue with my proposal to keep the term "scientism" neutral. As Gasparatou (2023, 60) puts it:

> I understand Mizrahi's proposal to remain neutral on scientism. That is, I understand where he comes from. But I cannot empathize with him. We already have non-derogatory terms, such as *naturalism*, *empiricism*, *materialism*, *physicalism*, denoting an empirically oriented epistemic and/or methodological attitude, as well as a materialist ontology.

Gasparatou is right to point out that scientism is a conceptual relative of naturalism, empiricism, materialism, and physicalism (see Mizrahi 2022a, 5–12). However, these -isms are not the same, and none of them captures the scientistic theses encapsulated by scientism.

[1] Goff's (2023) contribution to this book symposium is focused on Barwich's (2022) chapter, which is primarily about panpsychism, so I will leave it to Barwich to reply to Goff.

For instance, construed as a metaphysical thesis, scientism is a species of materialism, physicalism, or naturalism more broadly. However, scientism is narrower than materialism, physicalism, and naturalism insofar as there are material, physical, and natural things that are non-scientific (Mizrahi 2022a, 11). In other words, materialism, physicalism, and naturalism are not about *science* per se, whereas scientism is a view about science in particular.

Likewise, construed as an epistemological or a methodological thesis, scientism is a species of empiricism. But it is narrower than empiricism insofar as there are empirical ways of knowing or modes of inquiry that are not necessarily scientific (Mizrahi 2022a, 5). In other words, empiricism is not about *science* per se, whereas scientism is a view about science in particular.

Gasparatou (2023, 58) prefers to characterize scientism as "an overall attitude that Science is Oh-So-Super." I am afraid I am not quite sure what she means by that. I have to say that it strikes me as another pejorative definition of "scientism," but I cannot say for sure that it is. Gasparatou (2023, 59) provides some clarification when she says that her "point [is] that, with all their accomplishments, the many sciences are still tentative human practices, practiced by regular humans." To be sure, science is a human enterprise. But this is entirely consistent with Weak Scientism. That is, it can be true both that science is done by fallible human beings and that scientific knowledge is the best knowledge we have. In other words, Weak Scientific is consistent with the fact that scientists are human beings.

Gasparatou (2023, 59) rightly observes that Weak Scientism "says nothing about [...] what counts as *knowledge*" (original emphasis). That is to be expected, given that Weak Scientism is not meant to be an analysis of knowledge. Pace Gasparatou (2023, 59), however, Weak Scientism does say something "about the sciences." It says that the sciences produce knowledge (or some other epistemic good, such as justified belief) that is better–both quantitatively and qualitatively–than the knowledge produced by non-scientific disciplines (Mizrahi 2022a, 14).

Gasparatou (2023, 60) goes on to say that "the meaning of a term is determined by its use *throughout history;* and, so far, 'scientism' has been widely used as a pejorative term" (emphasis added). This is incorrect, however, given that the pejorative use of "scientism" is a fairly recent phenomenon. Historically, the term "scientism" has been used non-pejoratively. Indeed, Haack (2012, 76) herself observes that "the word 'scientism' was neutral" before it was weaponized by those who sought to defend religion from what they saw as science trespassing on its territory (Mizrahi 2022a, 3).

Historically, the term "scientism" was used to denote an epistemological thesis concerning the acquisition of knowledge. For example, in Stephen Pearl Andrews' *The Primary Synopsis of Universology and Alwato: The New Scientific Universal Language* (1871, xiii), scientism is defined as "the Spirit or Principle of Science–regular, exact, precise, etc." Similarly, Henry N. Day (1870, 513–514) uses the term "scientism" to refer to an epistemological view that gives priority to "observation over reflection." And *The Century Dictionary: An Encyclopedic Lexicon of the English Language* (1890) defines scientism as "the views, tendency, or practice of

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scientists." By Gasparatou's own lights, then, the term "scientism" should remain neutral just as it has been historically (Mizrahi 2022a, 1–12).

Gasparatou ends her paper by asserting "that scientism, either as a vague disposition or however one may define it, (1) is based on a false image of Science, (2) advances oversimplified premises about the evolution of human thought, (3) encourages absolutist, polarizing, stands, and (4) deeply hurts public discourse, our epistemic literacy, and the sciences too." Unfortunately, Gasparatou does not provide any evidence in support of these assertions, so it is difficult to assess them. It is unclear to me how Weak Scientism "hurts public discourse." In fact, pejorative definitions of scientism are those that turn the scientism debate in academic philosophy into a mere verbal dispute (Mizrahi 2017, 351–353; 2022a, 3–4; 2023, 39–41). It is also unclear to me how Weak Scientism "encourages absolutist, polarizing stands." In fact, proponents of weak (Mizrahi 2017) or moderate (Buckwalter and Turri 2018) versions of scientism argue that academic philosophy can become more scientific by incorporating the empirical methods of the sciences, and thereby enjoy the sorts of success the sciences have (Mizrahi 2022c). How is that polarizing?

It is unclear to me how Weak Scientism "advances oversimplified premises about the evolution of human thought." In fact, I am not even sure what "oversimplified premises about the evolution of human thought" Gasparatou is referring to here. As far as I can tell, Weak Scientism is not committed to any views about the evolution of human cognition. Finally, it is unclear to me how Weak Scientism "is based on a false image of Science." In fact, Weak Scientism is not committed to there being "Science" with a capital "S." Weak Scientism simply says that the knowledge produced by scientific disciplines is superior–both quantitatively and qualitatively–to the knowledge produced by non-scientific disciplines. In that respect, it is consistent with Gasparatou's preference of talking about the sciences rather than "Science."

2. Reply to Vrahimis

As I understand it, Vrahimis has no specific objections against Weak Scientism per se. Instead, he has a rather general doubt about my use of sentiment analysis. Sentiment analysis is a well-established and widely used text classification tool that comes from computational linguistics and Natural Language Processing (NLP). In opposing it, despite its widespread use in academic disciplines other than philosophy (Shaik et al. 2023), Vrahimis provides a rather nice illustration of "philosophical territorialism" (Mizrahi 2022b, 39–40; 2022c, 182–183) and "disciplinary border policing" in academic philosophy (Mizrahi 2022d, 189–190). Be that as it may, Vrahimis's main concern about my use of sentiment analysis, as I understand it, is that it does not respect the use/mention distinction. As Vrahimis (2023, 42) puts it, "An 'opinion mining' algorithm [...] fails to make the pertinent distinction between use and mention." This is demonstrated, according to Vrahimis, by two "counterexamples," namely, his own published articles on scientism, which are included in the sample of academic articles I used for a sentiment analysis in Mizrahi (2022b).

Contrary to what Vrahimis (2023, 46) claims, however, his "counterexamples" do not demonstrate that "sentiments cannot be 'mined' by an algorithm that makes no distinction between use and mention." This is because of what appears to be fundamental misunderstandings of the sentiment analysis I performed and the conclusion I draw from it.

The first misunderstanding, which may stem from Bryant (2020), is about "negative" as a tag in sentiment analysis and pejorative definitions of "scientism." This misunderstanding becomes apparent when Vrahimis (2023, 39) says that "Not all philosophers use the term [namely, "scientism"] in 'inherently *negative*' (29) or *pejorative* ways" (emphasis added). I say that the source of this misunderstanding might be Bryant (2020) because Vrahimis quotes Bryant (2020, 29) here. Notice how Vrahimis confuses the *negative* tag of sentiment analysis with *pejorative* definitions of "scientism" here. However, the "negative" tag of sentiment analysis and pejorative definitions of "scientism" are not interchangeable. They are two different things.

Here is an example of a *pejorative* definition of "scientism": "a cult that has made a religion out of science" (Rasmusson 1954, 393). As indicated by the use of the term "cult," this is a pejorative definition of "scientism." Now, one could have positive or negative sentiments about this pejorative definition. Rasmusson himself has a *positive* sentiment toward this *pejorative* definition; after all, it is his definition, which he uses to argue against scientism. Since he argues against scientism, Rasmusson probably has a *negative* sentiment toward scientism, which he defines pejoratively. Indeed, he calls scientism "dogmatic" and "foolish" (Rasmusson 1954, 393). Accordingly, one could have *positive* or *negative* sentiments about *pejorative* definitions of "scientism," and so we should not confuse the "negative" tag of sentiment analysis with pejorative definitions of "scientism" as Vrahimis (2023) seems to do.

The second misunderstanding about my use of sentiment analysis becomes apparent when Vrahimis (2023, 39) says that "the mere appearance of the word 'scientism' in a text does not suffice to determining whether the author feels threatened by it." He makes this claim again when he says that "the mere fact that the word ['scientism'] appears in a text says nothing about the author's attitudes towards 'scientism'" (Vrahimis 2023, 39). But this is incorrect. It is not the mere appearance of the word "scientism" that determines the classification of a text by the Azure Machine Learning algorithm. Rather, it is the appearance of words in sentiment lexicon, such as the Multi-Perspective Question Answering (MPQA) Subjectivity Lexicon (http://mpqa.cs.pitt.edu/lexicons/subj_lexicon/), which is a commonly used subjectivity lexicon in NLP, that determine whether a text is tagged as "negative," "positive," or "neutral" (Taufek et al. 2021).

So, even if the term "scientism" is "ambiguous," as Vrahimis (2023, 39) claims, or even if scientism comes in different varieties that could be different from the conception of scientism that the author of the text being analyzed may or may not endorse, that is irrelevant to the sentiment analysis I performed. As long as the text being analyzed contains expressions that the algorithm is trained to classify, the algorithm will tag the text as "negative," "positive," or "neutral" based on those expressions. After all, in this context, the purpose of a sentiment analysis is to find out what sentiments toward scientism, however

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construed, are typically found in journal articles written by academic philosophers. The goal is not to find out about the personal sentiments of any individual philosopher. This is why, contrary to what Vrahimis (2023, 42) claims, the use/mention distinction is irrelevant to my use of sentiment analysis.

The use/mention distinction is irrelevant not only to my use of sentiment analysis, contrary to what Vrahimis (2023, 46) claims, but also to the conclusion I draw from it. The conclusion I draw from a sentiment analysis of philosophical articles on scientism is "that, for the most part, articles on scientism written by academic philosophers tend to contain mostly negative, rather than positive (or neutral) sentiments about scientism" (Mizrahi 2022b, 30). Note that this conclusion says nothing about any individual philosopher having any particular sentiment. This is not a conclusion about the personal sentiments of individual philosophers. Rather, it is a statistical conclusion about the frequency of sentiments about scientism in philosophical texts.

Vrahimis (2023, 42) misses the point when he says that, as the author of two articles about scientism, he "does not, in either case, uphold *his own* stance, either positive, negative, or neutral, concerning the 'scientism' criticised by the figures discussed" (original emphasis). Whether Vrahimis, or any other individual philosopher for that matter, expresses *his or her own* positive or negative sentiments about scientism in his writings is completely beside the point. As long as Vrahimis's articles contain expressions that the algorithm is trained to classify, the algorithm will tag the text from those articles as "negative," "positive," or "neutral" based on those expressions, whether those expressions are of the author's own sentiments or not.

In other words, if an academic philosopher, say Vrahimis, quotes another philosopher, say Wittgenstein, who writes that scientism (of some variety or another) is "exceedingly stupid" (Vrahimis 2023, 42), then it necessarily follows that there is at least one negative sentiment toward scientism in a journal article published in an academic journal of philosophy. For the sentiment analysis I performed and the conclusion I drew from it, it does not matter whether the negative sentiment is Vrahimis's or Wittgenstein's. What matters is that there is a negative sentiment about scientism in a philosophical text. For again, the purpose of the sentiment analysis I performed is not to draw any specific conclusions about the personal sentiments of any individual philosopher. Rather, the goal is to draw statistical conclusions about the prevalence of sentiments about scientism in academic philosophy in general. Indeed, Vrahimis (2023, 43) himself seems to acknowledge this point when he says that "it is true, in either case, that the articles do somehow 'contain' negative sentiments towards scientism." And that is all that matters. Whether those sentiments are *his* (or some other philosopher) is completely beside the point.

Relatedly, it is important to note that counterexamples do not–and cannot–demonstrate that statistical conclusions are false. Once again, the conclusion I draw from a sentiment analysis of philosophical texts on scientism is that "if we were to pick at random a journal article about scientism written by an academic philosopher, that article is more likely to contain negative, rather than positive (or neutral), opinions about scientism" (Mizrahi 2022b, 30).

Clearly, Vrahimis's "counterexamples" do not demonstrate that this statistical generalization is false. A statistical conclusion according to which 68 percent of philosophical articles on scientism were tagged as "negative" by the Azure Machine Learning algorithm (Mizrahi 2022b, 30) cannot be refuted by one or two philosophical articles on scientism that have neither positive nor negative sentiments about scientism. No one would claim that all texts must be amenable to classification by the Azure Machine Learning algorithm. Certainly, I did not claim that all philosophical texts on scientism must be amenable to classification by sentiment analysis. So, again, Vrahimis's "counterexamples" miss their intended target entirely.

As mentioned above, Vrahimis says nothing about Weak Scientism in particular. However, beyond his opposition to my use of sentiment analysis, he does make one point about scientism in passing. Vrahimis (2023, 40) writes:

> As an aside, a criticism of Mizrahi's typology deserves some attention here. Mizrahi explicitly focuses on 'neutral' (2022, 3) uses of 'scientism'. As a result, at least one significant critical use of the term is ignored by Mizrahi's typology: 'scientism' as the characterisation of any attempt to apply the methods of scientific inquiry where they are strictly speaking inapplicable.

In Mizrahi (2022a), however, I discuss scientism as a methodological thesis. According to the *strong* variant of methodological scientism, only scientific methods produce knowledge (or some other epistemic good, such as justified belief). I go on to say that strong methodological scientism implies that non-scientific disciplines must use scientific methods if they are to produce knowledge, and I discuss "scientific imperialism" (Kitcher 2012) and "scientific expansionism" (Stenmark 2004). This is precisely the conception of scientism that Vrahimis (2023, 40) refers to when he talks about "any attempt to apply the methods of scientific inquiry where they are strictly speaking inapplicable." Pace Vrahimis, then, this conception of scientism is not ignored in Mizrahi (2022a).

Pace Vrahimis (2023, 40), too, I neither "dismiss" the "view that science has limits" nor "side" with Hempel (1973). Rather, I discuss Hempel's (1973) argument against the claim that there are certain questions that are beyond the scope of scientific inquiry, just as I discuss arguments for this claim, such as those made by Stenmark (2016) and Haack (2012) (Mizrahi 2022a, 8–9). The view I defend, namely, Weak Scientism, is a scientistic thesis of the *epistemological*, not methodological, variety.

According to the *weak* variant of methodological scientism, scientific methods are better than non-scientific methods as far as knowledge (or some other epistemic good, such as justified belief) production is concerned. On this variant of methodological scientism, scientific methods are not the *only* knowledge-producing methods. Instead, they are *better* than non-scientific methods. Buckwalter and Turri's (2018) "moderate scientism" falls under this variant of methodological scientism. According to Buckwalter and Turri (2018, 292), "Scientific research has promoted significant progress in philosophy," which is why "its further development within the field should be welcomed and encouraged."

If the introduction of scientific methods into academic philosophy can be, and has been, successful, as some proponents of scientism argue (Buckwalter and Turri 2018; Mizrahi 2022d), then it is difficult to explain the opposition to the introduction of scientific methods into philosophy by some academic philosophers. For instance, sentiment analysis has been used in various fields, from business (Ligthart et al. 2021) to education (Shaik et al. 2023), quite successfully. Why resist its application to research in academic philosophy? Is philosophy essentially different from other disciplines where sentiment analysis has been used successfully? If so, how is it different? Are academic philosophers worried about the introduction of scientific methods into their discipline? If so, why? These are some of the questions I wanted to begin to broach in Mizrahi (2022b). Of course, I welcome the use of surveys and interviews (Vrahimis 2023, 41), as well as other empirical methodologies, in trying to find answers to these questions. As an immature discipline in the Kuhnian sense (Mizrahi 2022d, 189), academic philosophy has nothing to lose and much to gain from the introduction of methods with a track record of success like the methods of the empirical sciences (Mizrahi 2022d, 190).

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