Putting scientific realism into perspective

Bortolotti, Lisa; Ambriz Gonzalez, Rafael

DOI:
10.1080/03080188.2022.2156150

Interdisciplinary Science Reviews

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/yisr20

Putting scientific realism into perspective

Rafael Ambríz González & Lisa Bortolotti

INTERDISCIPLINARY SCIENCE REVIEWS
https://doi.org/10.1080/03080188.2022.2156150

The Institute of Materials, Minerals and Mining
Routledge Taylor & Francis Group

OPEN ACCESS Check for updates

Putting scientific realism into perspective

Rafael Ambríz González and Lisa Bortolotti

Philosophy Department, University of Birmingham, Edgbaston, UK

ABSTRACT
In this paper, we offer a brief overview of the debate between realism and anti-realism in the philosophy of science. On the background of that debate, we consider two recently developed approaches aimed at vindicating realist intuitions while acknowledging the limitations of scientific knowledge. Perspectivalists explain disagreement in science without giving up the idea that currently accepted scientific theories describe reality largely accurately: they posit the existence of different perspectives within which scientific claims can be produced and tested. The integrative approach instead encourages researchers to embrace pluralism: conflicting frameworks and methodologies can be integrated when new knowledge is gained. In the natural and human sciences, researchers sometimes behave as if perspectivism is true; at other times, they hope for a reconciliation between conflicting frameworks and believe that this can be achieved by progressively filling knowledge gaps.

KEYWORDS
Scientific realism; instrumentalism in science; objectivity; truth; perspectival realism; integrative approaches; disagreement; scientific progress

1. Realism and anti-realism in the philosophy of science

A key philosophical question about science is how we can resolve a disagreement in science without giving up the idea that our current scientific theories are largely accurate descriptions of an external reality. In the first part of the paper, we introduce two philosophical positions, namely realism and anti-realism, and observe how both views have branched out in more radical and more moderate versions to respond to various objections and counterexamples. In the second part of the paper, we introduce *perspectival realism* and the *integrative approach* as exciting new forms of moderate realism. We discuss how they account for disagreement in science, considering two examples, one in physics and one in psychiatry.

Philosophical realism is a view that encompasses both claims about what there is (*metaphysical claims*) and claims about what we can know as human beings with limited cognitive capacities (*epistemic claims*). You step out in the garden and observe a big cat sitting on the wall. Now take your observation: 'There is a big cat on the wall.' If you are a realist, you believe that in the world there are objects (such as a cat and a wall) and properties (such as being big) that exist independently of whether you

CONTACT Lisa Bortolotti l.bortolotti@bham.ac.uk Philosophy Department, University of Birmingham, Edgbaston, UK

can observe them or think about them. Even if you did not see the big cat on the wall, the cat would still be there, sitting on the wall, and would still be a big cat.

The philosophical realist is also committed to the idea that our perceptual capacities are a good guide to what there is in the world: this does not mean that we can infallibly know about the objects and properties around us by trusting our senses. Of course, we can be subject to hallucinations. Other factors can also affect the reliability of our perceptual processes and the veridicality of our perceptual states: for instance, the cat may look bigger than it is if the cat is next to a mouse. However, the realist is committed to the idea that, by and large, our experience gives us a good reason to believe that things are out there in the world and are roughly as we experience them: if we see a cat and hear a miaow, then there is a miaowing cat out there.

Against realism, sceptics argue that we do not know whether the information we receive through our senses is a good guide to what there is in the world. That is because we can imagine scenarios in which what we take to be real is completely illusory, without us realizing the extent of the illusion. Hilary Putnam, for instance, discusses *the brain in a vat hypothesis*: suppose a mad scientist has removed your brain from your skull and managed to keep your brain alive. In a lab, the mad scientist has arranged for your now-disembodied brain to receive electrical impulses that offer the same stimulation your brain would receive if you experienced objects and properties in the world (Putnam 1982). So, your brain has the visual experience of there being a big cat on the wall, but there are no cats, no walls, and no 'you', apart from your electrically stimulated brain. This may seem a very far-fetched scenario, but the central idea is compelling: we could be in a situation where, based on our experiences alone, we would not be able to tell whether anything exists out there, independent of us.

When we apply philosophical realism to science, we get *scientific realism* (Bortolotti 2008). This is the view that our current scientific theories describe and explain reality in a largely accurate way – one common way to capture the idea is to say that the theoretical statements in those theories are *approximately true*. How does scientific realism work? Just as you come to know that there is a big cat on the wall by trusting your perceptual experiences of seeing a cat and hearing a miaow, so you can come to know that oxygen is required for combustion to occur when you observe that the flame is extinguished soon after the candle is placed under a glass. The observation of the flame being extinguished confirms the explanation provided by the theory of combustion because the observation is successfully predicted by the theory.

Obviously, there are other explanations that could be put forward to account for the extinguished flame. And this is where a scepticism-inspired view comes in. According to *anti-realism about scientific theories*, our current theories are useful to us by enabling us to make successful predictions about reality even if they did not describe and explain reality by and large accurately. And, for the anti-realist, we are not in a position to distinguish those theories that just enable successful predictions – and are just *empirically adequate* – from those that also describe and explain reality by and large accurately – and thus are *approximately true*.

How does anti-realism work? If you were a brain in a vat, you wouldn't know that you are a brain in a vat, because your perceptual experiences would be indistinguishable from the perceptual experiences you would have if you were not a brain in a vat. Similarly, you wouldn't know whether your theory is approximately true or merely empirically adequate because all you would have to judge the theory by is the predictions it makes. The theory that oxygen is needed for combustion to occur is confirmed by the observation that the flame is extinguished soon after the candle is placed under a glass. But all we can say is that the theory is empirically adequate: that is, our observation has not disconfirmed it. Whether the theory is also true is a further question that cannot be answered by observation alone.

Scientific anti-realism is supported by a series of arguments aimed at showing that empirical adequacy is all we can hope for. This erodes our confidence in the approximate truth of our current scientific theories. One such argument is the *pessimistic meta-induction*: the history of science teaches us that we ended up replacing all our previous theories when we realized that they did not describe and explain reality accurately (Laudan 1981). Isn't it overwhelmingly likely that our current scientific theories will also be replaced *one day*? Then, why should we believe *now* that they describe and explain reality accurately?

Scientific realism is defended by a series of arguments aimed at showing that it is plausible to believe in the approximate truth of scientific theories. One such move is the *no miracles argument* (Boyd 1989): we all agree that science has been overwhelmingly successful, and the accuracy of scientific theories is the best explanation for the success of science. In other words, the only explanation for the success of science that doesn't turn such a success into a miracle is that scientific theories are approximately true. If the theories were not approximately true, how else could we explain their continuing to enable successful predictions?

2. Types of realism and anti-realism

Not all anti-realist positions are the same, and even realism has branched out in various forms depending on how it reacted to the challenges posed by the sceptics. What differs across these views is the understanding of the role of scientific theories and the assessment of their capacity to provide objective knowledge about the world surrounding us.

One popular view is *instrumentalism* about science: the basic notion is that we should understand theories as tools we use to predict events, and not as accurate descriptions or explanations of reality that can be true or false. So, we should not *believe* theories, but *accept* them. When we *believe* that a big cat is on the wall or that oxygen is necessary for combustion, we commit ourselves to the *truth* of those statements – that is, we commit to the world being as the statements say it is. But if the sceptical challenges succeed in eroding our confidence, then we may no longer commit to the truth of there being a big cat on the wall or of oxygen being necessary for combustion. We merely *accept* that the big cat is on the wall based on our perceptual experience; and we *accept* that oxygen is necessary for combustion based on our empirical observations. This means that there is no further commitment on our part about reality being the way those statements say it is.

For the instrumentalist, the theory of combustion is a useful tool for predicting the behaviour of candles, but we would need to make *a leap of faith* to claim that the theory also describes and explains reality accurately. In particular, we would need to commit to the existence of entities that we cannot experience with our senses unless we are aided by instrumentation. For instance, we would need to believe that things like oxygen, which we cannot observe with our naked eyes, exist. Rather than making that leap of faith, we can merely *accept* the theory as a useful tool, leaving open the possibility that in the future a more precise tool will become available, leading to further successful predictions.

'Selective' forms of realism have been proposed to respond to the sceptical challenges, among which the most influential have been structural realism and internal realism. On these accounts, the basic realist intuition that scientific theories are approximately true is still endorsed but there is also an acknowledgement that scientific theories are limited as a means of attaining objective knowledge about reality.

Structural realism holds that scientific theories do not necessarily tell us about the nature of reality (e.g. what light is), but instead provide information about the underlying structure of reality (e.g. how light travels) (Worrall 1989). That would explain why competing theories are structurally very similar. Compare Fresnel's theory of light with Maxwell's. For Fresnel, light is made up of particles and moves through an elastic solid; for Maxwell, light is made up of waves and moves within an electromagnetic field.

F) Light is made up of particles
M) Light is made up of waves

The theories compete with one another and (F) and (M) cannot be both accurate descriptions of reality, as their descriptions of light conflict. However, both theories can accurately predict many observations about optics. For the structural realist, both theories *get something right*: they have correctly identified relationships between optical phenomena which means that they describe the structure of reality correctly if not its nature.

Although structural realism has been a very influential view, there are two main objections to it. First, it is not clear that for any scientific theory it is straight-forward to distinguish content (nature) from form (structure), and the distinction seems necessary if structural realism is to be a genuine alternative to scientific realism (Psillos 1995). Second, it is not clear that all instances of scientific change involve different accounts of the nature of reality and a structural continuity between competing theories (Chakravartty 2004): isn't how the theories capture the structure of reality also amenable to revisions?

Internal realism can be described as a compromise between scientific realism and instrumentalism about scientific theories (Putnam 1982). Take a simple question: How many objects are there in the dining room? If you are doing particle physics, you may answer by counting molecules. If you are setting the table, you may answer by counting chairs. What is the right way of answering the question? In a sense, both answers *get things right* relative to the appropriate conceptual scheme. For Putnam, there are things out there in the world, but how we describe and explain them is not independent of our minds, because the concepts we use to describe and explain them are a product of our minds.

We cannot describe and explain reality without using concepts, such as 'chair', 'molecule', 'wave', and 'particle', and which concepts we choose will affect what we come to state and believe about reality. You are not wrong when you answer the question how many objects there are in the dining room by counting chairs, even if your answer is different from that of the particle physicist. You and the particle physicist provide different answers because you have different interests, and apply a conceptual scheme that reflects those interests.

Although internal realism offers a compelling picture of how different conceptual schemes carve up reality, it may not help us decide whether one conceptual scheme does a better job than another at describing reality accurately. Is Maxwell's theory of light better than Fresnel's? Internal realism won't tell us that Maxwell's theory describes reality better because we lack a direct, neutral access to reality from which to evaluate the accuracy of the two competing theories. But we can tell whether Maxwell's theory has a better predictive success because internal realism can discriminate between conceptual schemes on the basis of how coherent and useful they are.

Perspectival realism acknowledges the existence of competing ways of carving up reality (*perspectives*) without giving up the possibility of comparing and evaluating those ways of carving up reality (Massimi 2018). This is *prima facie* a very attractive view. It combines the benefits of scientific realism – by salvaging the intuition that theories *get things right* – and those of other 'selective' forms of realism – by denying the foot-stamping (Fine 1984) and context-independent nature of some versions of scientific realism. We are going to discuss perspectival realism in more detail in the next section, as it is an immediately appealing and increasingly influential approach.

3. Perspectival realism and disagreement in physics

Just like scientific realism, also perspectivism is a view about what there is and how we come to know it, embracing the notion that there is a reality independent of us, whilst rejecting the objectivity of scientific knowledge. Michela Massimi presents the goal of the perspectivist very clearly:

> [O]ne can accept and fully endorse that scientific inquiry is indeed pluralistic and that there is no unique, objective, and privileged epistemic vantage point without necessarily having to conclude that perspectives shape scientific facts or relativize truth (Massimi 2018, page 170).

What is a *perspective*? According to Massimi, a perspective is 'a scientific practice, including the epistemic claims, methodological resources, and justification endorsed by a scientific community'. In particular, a practice comprises:

> (i) the body of scientific knowledge claims advanced by the scientific community at the time; (ii) the experimental, theoretical, and technological resources available to the scientific community at the time to reliably make those scientific knowledge claims; and (iii) second-order (methodological-epistemic) claims that can justify the scientific knowledge claims advanced (Massimi 2018, page 152).

On a metaphysical level (which concerns itself with what there is out there in the world), perspectivism acknowledges that there is a reality out there, independent of our perspective on it. This is what enables us to say that a theory *gets things right*. So, with respect to what there is, perspectivism is a legitimate form of realism. On the epistemic level (which concerns itself with our capacity to know reality), however, perspectivism argues that our capacity to attain knowledge about reality is mediated by our perspective. So, on what we can know, perspectivism counts as a selective form of realism, by claiming that our access to reality is constrained by our being situated in the world at a particular time and in a particular place.

For an understanding of perspectivism in science, it is important to highlight that all aspects of a scientific theory and of making science (what we claim to know, which experimental resources we have, and our methodological commitments) can vary across perspectives. However, epistemic standards are relatively stable. What are epistemic standards? Epistemic standards are the norms we use to assess scientific theories and may include simplicity, explanatory scope, and accuracy (Massimi 2017). The idea is that, if we are faced with two ways of interpreting the evidence that seem equally supported by our experiments so far, we may decide to opt for the interpretation that has some further advantages over the alternative: maybe the simplest one, the one that fits the best with other things we know, or the most elegant one.

Such epistemic standards can take different forms across different perspectives, but their stability enables us to compare scientific theories and ways of doing science from the standpoint of our current perspective. Even if our methods change and the things we believe to be true change across perspectives, the relevance and power of accuracy, simplicity, elegance, and coherence as epistemic norms remain stable. This enables comparisons and assessments, although these won't be delivered from an entirely neutral or objective standpoint. In sum, according to perspectival realism, a pair of apparently conflicting scientific claims can both be true: from the perspective of Maxwell's theory of light, light is made up of waves; from the perspective of Fresnel's theory of light, light is made up of particles. This is because each perspective comes with its rules for determining the truth of scientific statements. However, within our perspective, we can compare Fresnel's theory with Maxwell's theory on the basis of how simple, elegant, and coherent they are.

So how does perspectival realism account for disagreement in science, that is, differences in perspectives that are simultaneously available? Massimi (2018) proposes a refined version of perspectival realism, focusing on what it means to be dependent on a perspective. Massimi illustrates her notion of perspective-dependence with the following example:

(a) Water is a liquid with viscosity.

Allegedly, claim (a) poses a challenge for realism because it seems to be true according to hydrodynamics but false according to statistical mechanics, as Massimi explains. According to *hydrodynamics*, water is *a fluid*, and, consequently, has fundamental properties like viscosity. Therefore, (a) is true for hydrodynamics. But *statistical mechanics* treats water as *a collection of discrete molecules*, and, consequently, water has no viscosity. Therefore, (a) is false for statistical mechanics.

The problem for realists is to decide whether it is hydrodynamics or statistical mechanics that accurately describes the nature of water. But does scientific realism as such have the resources to solve this problem? Remember that scientific realism holds that currently accepted scientific theories are (largely) accurate descriptions of reality. If two of those theories conflict with each other, then they cannot be both accurate descriptions of reality, and we need to give one up. But this would be a self-refuting move for realism – since both theories are currently accepted scientific theories.

Massimi's perspectival realism offers a solution to this problem by distinguishing between *context of use* and *context of assessment*. Each perspective acts as a context of use – which is the context from within the scientific statement is made and where the rules for determining the truth of scientific statements are formulated. Each perspective also acts as a context of assessment – which is the standpoint from which scientific statements from other (previous or competing) perspectives are assessed in terms of how adequately they are performing.

If the context of use is hydrodynamics, (a) is true; if the context of use is statistical mechanics, (a) is false. But we can appeal to statistical mechanics as a context of assessment. An assessor could say: viscosity is a property of water from the perspective of hydrodynamics, and it 'still features in statistical mechanics, but this time as a derivative property (i.e. as the property of momentum transport across laminae of mean flow)' (Massimi 2018, 354). That is, from the perspective of statistical mechanics as the context of assessment there is *no* conflict between the statements of hydrodynamics and statistical mechanics, because (a) as uttered in hydrodynamics remains true when it is assessed from the perspective of statistical mechanics.

This is an appealing solution to the problem of disagreement in science, but one concern is that the assessor, as conceived of by Massimi, would have to gain access to more true statements than a practitioner of hydrodynamics, and to more true statements than a practitioner of statistical mechanics—the assessor would have to gain access to the statement that *viscosity is a derivative property of a collection of molecules of water*. Precisely because of this additional knowledge, the assessor can connect claims coming from hydrodynamics and from statistical mechanics, integrating the two successfully. That is, the context of assessment seems to be the perspective of physics *as a whole*, and not statistical mechanics in isolation from the other perspectives. The assessor would indeed ground the claim that (a) is true in wider knowledge about physics and be able to claim that:

(b) Water is a collection of discrete molecules that, as a collection, behaves as a liquid – which entails that it has viscosity.

Now, (b) is a true statement according to current physics, which dissolves the apparent conflict between statistical mechanics and hydrodynamics. Even for the practitioner of statistical mechanics, it is true that water has viscosity—but viscosity is not a property relevant to the study of water within the perspective of statistical mechanics. In other words, statement (b) displays a fuller and more accurate description of water than (a).

Let's consider another example. What can we do when the disagreement involves scientific statements that are not uncontroversial in the scientific field? It is usually accepted that, according to the general theory of relativity, nothing within spacetime travels faster than light. But quantum mechanics has identified a striking phenomenon called 'entanglement', which implies that information of the state of a physical system travels instantaneously between two entangled systems – that is, that the information travels faster than the speed of light. Both theories are widely accepted in physics because of their empirical success. For instance, quantum mechanics, it is often said, is the most accurately predictive theory humans ever produced. And, indeed, both theories are currently the main theories in physics, where general relativity accounts for very big objects, and quantum mechanics for extremely small objects.

Then, it would seem that from current physics we can infer that:

(c) Nothing travels faster than the speed of light in spacetime.
(d) It is not the case that nothing travels faster than the speed of light in spacetime.

To preserve credibility, realists should be able to account for such tensions in physics, explaining how we can interpret them in a realist way. One could say that in physics we lack a piece of knowledge that would enable us to choose between (c) and (d) or otherwise resolve the conflict between them. We currently do not know what that piece of knowledge is, but future empirical research and the further development of existing theories will increase the chance for us to gain the relevant piece of knowledge.

This reflects the attitude physicists take when they face conflicts between general relativity and quantum mechanics. For one of the main aspirations in physics is to develop a theory that *unifies* both of those theories, something like a theory of 'quantum relativity'. We can take it that such a unifying theory, once developed, would rule out either (c) or (d) or explain the apparent conflict between them, and do the same for other significant conflicts between quantum mechanics and general relativity. Indeed, it is the thought that conflicts between the theories can be solved by a unified theory that motivates the development of such a theory.

4. Perspectival realism and disagreement in the mental health sciences

Should scientists take the same attitude towards conflicting claims in the human sciences? An analogous situation to the one concerning the general theory of relativity and quantum mechanics in physics can be found in psychiatry. Because psychiatry is a medical field grounded in sciences that are less mature than physics, the controversial claims are not reserved to low-level empirical statements but extend to higher-level statements about what makes something an entity that can be investigated within that field (see e.g. Fellowes 2021).

In particular, there are controversies about what counts as a psychiatric disorder, and about how to conceive psychiatry itself. Due to the conceptual nature of these disagreements, it may appear that a perspectival approach would be particularly well suited to address them.

Take the following statements:

(e) What makes something a mental disorder is that it is a biological dysfunction.
(f) It is not the case that what makes something a mental disorder is that it is a biological dysfunction.

Statement (e) can be inferred from the perspective of biological psychiatry. Statement (f) follows from the perspective of social psychiatry.

Biological psychiatry posits that at least some of the conditions classified as mental disorders are biological dysfunctions. This is a dominant perspective in psychiatry, and it is a stance clearly influenced by the status of other areas of medicine, in which diseases are understood as biological dysfunctions. In psychiatry, though, such an assumption remains controversial, for the consensus is that, although there are many good candidates of biological factors that could be associated with some psychiatric conditions, up to now it has proven challenging to reliably associate biological factors with some of the diagnostic categories of mental disorder.

Some researchers aspire to find those biological factors that could validate diagnostic categories, in hope of being able to further define psychiatric conditions in terms of the biological factors associated with them. Such as Down's syndrome is currently associated with having an extra chromosome 21, biological psychiatrists hope that, say, schizophrenia will be associated with a certain biological factor. In sum, biological psychiatry endorses (e).

On other conceptions of mental disorders, conditions could not be classified as disorders without considering behavioural aspects and values. For instance, the symptom-based conception implies that what makes something a mental disorder is a pattern of behaviour. Social psychiatry has a broader view of mental disorders: social, psychological, and environmental factors are crucial for the development of such disorders. What makes something a mental disorder for social psychiatry is that it is associated with a certain combination of social, psychological, and environmental factors. In sum, social psychiatry endorses (f).

A few years ago, a new research project was launched in order to attempt to gain new knowledge about mental health from various domains, including the biological – genetics, molecules, cells, and physiology – and the psychological – behaviour and self-report. It is the Research Domain Criteria project (RDoC). RDoC's aim is to 'understand the nature of mental health and illness in terms of varying degrees of dysfunction in general psychological/biological systems' (NIH, 2022). Given the current lack of biological validation of the diagnostic categories, and the problems this carries, RDoC advocates consider that

> [i]t is essential to find a way to *increase knowledge* concerning the biological, physiological, and behavioral components and mechanisms through which multiple and interacting mental health risk and protective factors operate–a research framework that does not rely on disorder-based categories (NIH, 2022, our emphasis).

As we can see, researchers' attitude towards conflicting claims in psychiatry varies. Sometimes, biological and social psychiatry are seen as so different from each other that the only option we have when we are faced with the choice between two conflicting claims is to say that each is true according to one of the competing perspectives. But in frameworks like the RDoC, the assumption is that researchers lack relevant knowledge *at present*, knowledge that once gained, will allow them to resolve the dispute between the claims.

This idea is exemplified by Dan Stein's integrative approach. Stein (2021) takes it that biological psychiatry and social psychiatry are two frameworks 'guiding the future of psychiatry' (181). The author recognizes that there is an apparent conflict between these frameworks—that the former attempts a biological characterization of the domain of mental health and illness, whereas the latter is rather socially and psychologically oriented. A perspectival approach would dictate that, depending on the perspective one takes, one or the other characterization would be the correct conception of mental health and illness. However, Stein argues that each framework involves research 'gaps'. As Stein puts it:

> For clinical neuroscience, a major gap in psychiatry is that our diagnostic systems are not aetiologically based and that our treatments are not sufficiently personalized […] For global mental health, on the other hand, a major gap in psychiatry is underdiagnosis and undertreatment (Stein 2021, 182).

Stein's idea is that psychiatry will make progress by advancing research in each framework:

> [for] clinical neuroscience [psychiatry] will advance by understanding how brain mechanisms lead to symptoms, by developing biomarkers that are useful for diagnosis and treatment stratification, and by developing treatments that address those mechanisms that are involved in a particular individual's symptoms […] [for] global mental health […] psychiatry will advance by understanding the social determinants of mental disorders, by developing interventions that are feasible and acceptable across the world, by scaling these up for delivery by nonspecialized health workers (Stein 2021, 182).

Stein proposes an *integrative* approach to psychiatry that recognizes

> that psychiatry has a range of gaps; that advances in psychiatry require both discovery and implementation research, that clinical neuroscience and global mental health *can join forces* to drive such research forwards, aiming for a personalized public health that addresses more precisely a range of individual and social determinants of mental illness. (182–183, our emphasis)

Facing the conflict between biological and social psychiatry, Stein's attitude is that mental health researchers should gain knowledge from each framework in order to further integrate such knowledge into a unified, non-conflicting conception of mental health and illness. Importantly, we can also note that the ultimate perspective sought by the integrative approach is the one of psychiatry *as a whole* – that is, the perspective of the body of knowledge in psychiatry.

Thus, disagreement in physics and psychiatry illustrates that, in some instances of conflicting scientific claims, the attitude scientists take is that the conflicting claims can both be true, but according to different perspectives; in other instances, the attitude is to integrate the competing approaches as much as possible and recognize the existence of knowledge gaps that will be filled when further facts are discovered.

5. Conclusions and limitations

In this paper, we offered a brief overview of the debate between realists and anti-realists. Both are concerned with whether science can deliver objective knowledge of reality and whether currently accepted scientific theories represent the world in a largely accurate way.

We also provided a quick update on the realism debate by discussing two recent proposals made by perspectivists and integrationists about how to address disagreement in science. According to perspectivism, scientists view the world from a given perspective. When the perspectives differ significantly, the claims scientists commit to within a perspective can clash with the claims that are regarded as true from another perspective. According to the integrative approach, there is a clear tendency among scientists to pursue the development of a coherent body of knowledge within each science, and the explicit or implicit goal is to avoid committing to conflicting statements by pursuing relevant new knowledge. Knowledge gaps at our present time are seen as a powerful motivation to pursue further research and not as problems for a realist conception of science.

This perspectival and the integrative approaches can work at various levels of generality and in distinct fields, from whether water has viscosity to whether biological dysfunction is what characterizes mental disorders. However, how perspectivism and the integrative approach can be successfully applied to specific instances of disagreement is a challenging question that deserves further investigation.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by the University of Guadalajara's Global Talent Scholarships Programme [grant number V/2019/2046] awarded to Rafael Ambríz González.

Notes on contributors

Rafael Ambríz González is a doctoral researcher in Philosophy at the University of Birmingham (UK). He received an MSc in Philosophy of Science from The London School of Economics and Political Science. His research concerns the concept of disorder in both psychiatry and medicine in general, and also addresses the relation between biological factors and psychiatric conditions, and causation in psychiatry. Ambríz González is also interested in topics in the philosophy of science, such as realism and underdetermination of theory by evidence.

Lisa Bortolotti is a Professor of Philosophy at the University of Birmingham (UK), affiliated both with the Philosophy Department and the Institute for Mental Health. She works in the philosophy of the cognitive sciences, and she is the author of two textbooks, *Introduction to the Philosophy of Science* (Polity, 2008) and *Philosophy of Psychology: An Introduction* with Kengo Miyazono (Polity, 2021). Bortolotti is mostly interested in the strengths and limitations of human cognition, and she wrote extensively on belief, delusion, confabulation, optimism, agency, and rationality. Her latest monograph is *The Epistemic Innocence of Irrational Beliefs* (Oxford University Press, 2020). She is also the Editor in chief of *Philosophical Psychology* (Taylor & Francis).

ORCID

Rafael Ambríz González http://orcid.org/0000-0003-4807-612X
Lisa Bortolotti http://orcid.org/0000-0003-0507-4650

References

Bortolotti, L. 2008. *Introduction to the Philosophy of Science*. Cambridge: Polity Press.
Boyd, R. 1989. "What Realism Implies and What It Does Not." *Dialectica* 43 (1–2): 5–29. doi:10.1111/j.1746-8361.1989.tb00928.x.
Chakravartty, A. 2004. "Structuralism as a Form of Scientific Realism." *International Studies in Philosophy of Science* 18: 151–171. doi:10.1080/0269859042000296503
Fellowes, S. 2021. "Scientific Perspectivism and Psychiatric Diagnoses: Respecting History and Constraining Relativism." *The European Journal of Philosophy of Science* 11: 8. doi:10.1007/s13194-020-00320-x.

Fine, A. 1984. "The Natural Ontological Attitude." In *Scientific Realism*, edited by J. Leplin, 83–107. Berkeley: University of California Press. doi:10.1525/9780520337442-005

Laudan, L. 1981. "A Confutation of Convergent Realism." *Philosophy of Science* 48 (1): 19–49. doi:10.1086/288975

Massimi, M. 2017. "Four Kinds of Perspectival Truth." In *Philosophy and Phenomenological Research*, 342–359. vol. CXVI, no. 2 doi:10.1111/phpr.12300

Massimi, M. 2018. "Perspectivism." In *The Routledge Handbook of Scientific Realism*, edited by J. Saatsi, 164–175. Oxford: Routledge.

National Institute of Mental Health. 2022. "The RDoC initiative: Why RDoC?" Accessed 13 December 2022. https://www.nimh.nih.gov/research/research-funded-by-nimh/rdoc/about-rdoc

Psillos, S. 1995. "Is Structural Realism the Best of Both Worlds?" *Dialectica* 49: 15–46. doi:10.1111/j.1746-8361.1995.tb00113.x

Putnam, H. 1982. *Reason, Truth and History*. Cambridge: Cambridge University Press.

Stein, D. 2021. *Problems of Living. Perspectives from Philosophy, Psychiatry, and Cognitive-Affective Science*. Rio de Janeiro: Elsevier.

Worrall, J. 1989. "Structural Realism: The Best of Both Worlds?" *Dialectica* 43: 99–124. doi:10.1111/j.1746-8361.1989.tb00933.x