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ORIGINAL ARTICLE

The continuity of inquiry and normative philosophy of science

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Abstract

This paper aims to contribute to debates about the nature of philosophical inquiry and its relation to science. The starting point is the *Discontinuity View* (DV), which holds that philosophy is discontinuous with science. Upon critically engaging two lines of argument in favor of DV, the paper presents and defends the *Continuity View* (CV), according to which philosophy and science are continuous forms of inquiry. The critical engagement sheds light on continuities between philosophical and scientific inquiry while underlining special normative competences of philosophical work. The final part of the paper uses these insights to offer a brief outline of a normative approach to philosophy of science.

KEYWORDS
conceptual analysis, normativity, science

1 | INTRODUCTION

The history of philosophy is intertwined with that of the natural sciences, and philosophical reflection on elements of scientific inquiry has gained a prominent place in the philosophical landscape. The enormous progress in science has brought along distinctive challenges that make it a particularly appropriate site for philosophical inquiry, and most key scientific fields are today accompanied by subdisciplines of philosophy that examine the nature, aims, and methodology of the subject matter of that field. While philosophy of science has long been dominated by debates that can be traced back to the first half of the twentieth century, the improved comprehension of the historical and social embeddedness of scientific practice has led

to a broader understanding of its tasks, which now include investigating genuinely normative questions (see, e.g., Kitcher 2001 and 2011).

This development raises questions about the nature of philosophical inquiry itself and its relation to science. With respect to such questions, many philosophers subscribe to what I refer to as the *Discontinuity View* (DV), which maintains that philosophy is discontinuous with science and that philosophical work is detached from the method and content of science. The first part of the paper critically engages two lines of argument in support of DV that we find in the philosophical literature. Very roughly, according to the first line of support, science performs empirical work, while philosophy performs conceptual work. According to the second line, scientific work is descriptive, while philosophical work is normative, essentially in the business of providing standards by which to evaluate its subject matter. Having assessed these lines of argument, the second part of the paper outlines the *Continuity View* (CV), according to which philosophy and science are continuous forms of inquiry. The paper defends CV from the charge that it amounts to a form of unattractive scientism.

The critical engagement of the two lines of argument for DV helps clarify continuities between philosophical and scientific inquiry and highlights special normative competences of philosophical work that can be used to support a particular approach to philosophy of science. On this basis, the last part of the paper offers a brief outline of a normative approach to philosophy of science. This approach accepts the view of philosophy of science as a second-order discipline that deals with sciences that study the natural world (at least in paradigmatic cases). In both science and philosophy of science, theories developed secure evidential support with data, but the empirical data in the sciences are about the natural world (at least in paradigmatic cases), whereas empirical data in philosophy are about the natural sciences. Nonetheless, building on CV, the normative approach proposed here comprehends second-order philosophical inquiry as building on some normative fundament that is already more or less explicitly present in the sciences. This is very much in line with Elliott E. Sober's general idea that "normative philosophy of science is continuous with the normative discourse that is ongoing within science itself" (Sober 2008, xv). On this basis, the normative approach proposed here not only aims to offer a comprehensive view of normativity as an integral part of science but also shows how several levels of normativity intertwine in scientific fields.

2 | THE FIRST LINE OF ARGUMENT FOR THE DISCONTINUITY VIEW (DV)

According to DV, philosophy and science are radically different enterprises with no continuity between their methods and objectives. Michael Dummett argues that when disciplines that originally had philosophy as their "parental home" break off from philosophy, we are left with "a discipline that makes no observations, conducts no experiments, and needs no input from experience: an armchair subject, requiring only thought" (2010, 4). Correspondingly, philosophy "stands in complete contrast with sciences" (7), in terms both of its objective and its method, which means that philosophy and science are like *oil and water*: they do not mix. In terms of its *objective*, unlike the sciences, philosophy is not dedicated to describing the physical properties of entities but to analyzing the concepts we use to speak about them. While science investigates first-order aspects of nonlinguistic reality using observation and experiment, philosophy aims at establishing a priori necessary truths. In terms of its *method*, philosophy deploys conceptual analysis, which is done from the armchair, independent of empirical assumptions, observations, and experiments. Due to these fundamental differences in objective and method, A. J. Ayer argued that philosophical and scientific propositions "cannot conceivably contradict one another" (1946, 50–51). Moreover, while philosophy may function as the incubator of ideas that later form the basis for scientific inquiries, the differences preclude

not only continuity but also cooperation across the disciplines beyond a joint division of scientific and philosophical questions.[1]

DV enjoys relatively wide support. Some are explicitly committed to it, while others, in their effort to carve out a legitimate niche for philosophical work, are implicitly committed to it. Some philosophers in the latter group point to questions about science and maintain that these are not resolvable from within science: that is, they cannot be settled empirically by means of experiment and observation and require philosophical reflection. Typical examples include questions about the boundaries of science, the references of theoretical terms, criteria of theory acceptance, validity, inductive warrant, corroboration, falsification, causality, probability weighting, and many other issues that figure among the fundamental problems of philosophy of science (see Barker and Kitcher 2013). A more detailed discussion of the details would take us off topic, but one may suspect that the claim that these issues cannot be answered from within science assumes a picture of science as mainly constituted by observation and experiment.

2.1 | Challenges to the first line of argument

Dummett's arguments build on a number of assumptions that are worth taking a critical look at. First, as to questions about method, *conceptual analysis is not unique to philosophy*. In mathematics, for example, conceptual analysis is deployed to define concepts such as a prime number. In medicine, conceptual analysis is deployed to reflect on the meaning of "placebo" or "endophenotype" (Kendler and Neal 2010), which is useful especially in cases in which measurement has advanced more rapidly than conceptual clarification. Of course, there are a number of differences. For example, the concepts that constitute the targets of philosophical analyses are typically complex and deeply intertwined with and embedded in practices and institutional contexts. They are tied to preconceptions in a way that is very different from the way that the relatively pure and insulated concepts operate in mathematics, which render it a truly aprioristic field of inquiry (Dennett 1986). But it is not clear why such differences would amount to methodological dissimilarities of a kind that would lend support to DV. In reply, proponents of DV might argue that the essential difference is that, unlike mathematicians, philosophers analyze concepts as they are understood in everyday usage. This is indeed true in many cases, but this reply fails to take into account that there are plenty of examples in philosophy where conceptual analysis aims to capture concepts as used in professional contexts, outside everyday discourse.[2]

Second, Dummett emphasizes that philosophy and science are discontinuous because (a) being empirical is a necessary condition for science and (b) philosophy is not empirical. Both (a) and (b) are flawed, however. As to (a), we might argue that it builds on an erroneous view of science as exclusively interested in discovering empirical aspects of phenomena by using observational and experimental methods. There are a number of formal sciences (for example, mathematical logic, geometry, arithmetic) that are recognized as properly scientific, while not being empirical in the sense of being based on observation and experiment. This seems to indicate an important issue—an issue that will not be unfolded here in detail—namely, that being based on observation and experiment is not what makes a discipline science; rather, what makes it a science is some kind of systematic and rigorous organization of the inquiry and the

[1]To be fair, Dummett (2010, 25) acknowledges the possibility of joint reflection between philosophers and physicists, for example on the question about the direction of time. He also maintains, however, that this is a genuinely *philosophical* problem even if it is generated by physics.

[2]For example, in a series of papers, Christopher Boose (1977; 1987; and 2014) has provided an influential analysis of "disease" as used in theoretical medicine.

body of knowledge that it generates. Thus, if being empirical is not a necessary condition for science, then the claim that philosophy is not empirical is consistent with the claim that it is continuous with science.[3]

As to (b), that philosophy is not empirical, even if we accept that being experimental is a necessary condition for science, conceptual analysis might still qualify as properly experimental. More precisely, one could argue that conceptual analysis might be (i) inward-looking and experimental and (ii) outward-looking and experimental. This would contradict a main claim in DV that philosophy "relies solely upon reasoning on the basis of what we already know" (Dummett 2010, 10).

Let us first consider support for (i), that conceptual analysis is inward-looking and experimental. Philosophers investigate concepts by examining their own intuitions about hypothetical cases. Systematizing these intuitions, philosophical analysis of X provides necessary and sufficient conditions for X in such a way as to square with intuitions about individual cases. Alternatively, a philosophical hypothesis conjectured to be true (for example, about the necessary and sufficient conditions of X) can be tested by conducting thought experiments. During such experiments, philosophers often imagine cases in which necessary and sufficient conditions are fulfilled, attempt to produce counterexamples, and proceed by rejecting or amending the hypothesis. It may be argued that in this process philosophers generate a body of empirical data ("intuitions"), which they consult in order to test the hypothesis (McGinn 2015). In this sense, supporting (i), conceptual analysis may be experimental. The results of thought experiments can be seen as new pieces of information that philosophers acquire by using their conceptual apparatus. Similarly, some argue that armchair methods straightforwardly rely on empirical information (Kornblith 2017, 155), whereas others argue that they possess a subtle empirical dimension but still offer low-grade a priori justification (Henderson and Horgan 2011, 2). Of course, the fact that the intuitions are generated by the experimenter *in* the experimenter may lead to objections that intuitions have the epistemic status of hunches and should hence not be taken as good evidence. This does not, however, undermine the idea that thought experiments can be experimental.

As to (ii), contending that conceptual analysis is outward-looking and experimental, conceptual analysis can be conducted in a more directly observational, third-personal fashion. Consulting one's own intuitions about cases might not reflect the intuitions that people within a given linguistic community share, which is one of the reasons why work in experimental philosophy frequently proceeds by obtaining judgments of a large groups of individuals by using questionnaires. Experimental philosophers often argue that armchair theorizing is not well suited for certain tasks and stress that conceptual analysis should be carried out by techniques that offer an independent check on the reliability of the intuitions.[4] In any case, the body of empirical data ("intuitions") that experimental philosophers consult in order to test a hypothesis is straightforwardly empirical. One might object that, by deploying methods from the social sciences, experimental philosophy stops being philosophy (see Sorrell 2017), but the implications of this view would generate unacceptable consequences. After all, logic and epistemology can deploy mathematical and statistical methods without turning into mathematics

[3]Based on this line of thought, McGinn (2015) argues that philosophy is best seen as a formal science. But this view seems too strong. It requires accepting that philosophical work overwhelmingly consists of doing conceptual analysis, which is something that we have granted so far, but which actually does not reflect the reality of the profession. But if philosophy is not overwhelmingly conceptual analysis and sometimes deploys abductive inferences and inductive methods to identify regularities and laws from observations, then this undermines the idea that philosophy belongs to the formal and deductive sciences.

[4]The results differ from conceptual analyses produced by more traditional armchair means. Intuitions are influenced by ethnicity and class (Weinberg, Nichols, and Stich 2001); changing the order of case presentation might elicit exactly the opposite intuition (Swain, Alexander, and Weinberg 2008); the moral status of an action has an influence on whether that action is intentional (Pettit and Knobe 2009).

or statistics. In addition to these considerations about methods in experimental philosophy, we may also highlight cases in which conceptual analysis does not target folk concepts but targets concepts as used by experts, for example, by analyzing a body of written work (for example, the concept of disease in medical literature). In such cases, conceptual analysis is more clearly outward-looking and empirical.

Overall, philosophical inquiry does not seem to stand in the kind of contrast with scientific inquiry that would warrant accepting DV. A proponent of Dummett's view might oppose this conclusion and stress that in order to come to know the essential nature of some phenomena, philosophical research abstracts from empirical aspects. For example, philosophical work on "pain" will be interested in necessary truths about its subject. Such necessary truths can only be known a priori, while the contingent features that the relevant empirical sciences are interested in can only be known a posteriori. To assess this claim, we may start by considering that it relies on a well-known distinction that refers to specific ways of knowing. S knows *p* a priori if and only if S has come to know *p* independent of experience (except for the experience required to learn the meanings of *p*'s constituent term); S knows *p* a posteriori if and only if S has come to know *p* in a way that depends on experience. Accordingly, philosophers and scientists are not in a direct competition: philosophers aim at necessary truths, which can only be known a priori, whereas scientists aim at contingent truths that can only be known a posteriori. But this is false. Strong support for DV would require running together necessary truth and a priori knowable truth, which is problematic (Kripke 1980). Consider the following disjunction, which is itself a priori: *p* ("no one can be his or her own parent") or *q* ("kindergarten teachers are stressed these days"). Mary knows *p* a priori (the concept of parent has everything that is required), but she does not know *q* and lacks factual knowledge about the current conditions of kindergarten teachers. Being a social scientist, Ari knows a posteriori *q*, but not *p*. Both Mary and Ari are able to competently deduce the disjunctive conclusion. But from the premise *p* Mary comes to know *q* a priori because the deduction is not dependent on experience. Moreover, from the premise *q*, Ari comes to know *p*, a necessary truth, a posteriori.

3 | THE SECOND LINE OF ARGUMENT FOR THE DISCONTINUITY VIEW (DV)

The first line of argument introduces a clear division of labor: the sciences are engaged in *empirical* work, while philosophy is engaged in *conceptual* work. Some might accept that this is false but offer a second line of argument in favor of DV, according to which philosophy is a *normative discipline*, while science is essentially descriptive. In a series of papers, Amie Thomasson (2015 and 2017) has argued that unlike in the sciences, the primary aim in philosophical inquiry is not descriptive but normative. Descriptive questions about what *is* the case are best dealt with via the empirical methods of the sciences, but these do not tell us what *ought to be* the case, which is what philosophy does.[5]

Indeed, normativity is involved in a large number of philosophical undertakings, not merely in certain parts of philosophy like aesthetics and ethics. Just as ethics might be about unearthing the norms to which our actions ought to conform, logic can be said to unearth norms to which our thinking ought *to* conform. Aristotle's doxastic law of noncontradiction does not describe how we reason but offers norms for reasoning, which is why Frege urged

[5]Thomasson's account is developed as a reply to the charge from Hawking and Mlodinow (2010). Thomasson (2015 and 2017) has argued that the criticism is correct if we think of philosophy as a factual discipline aimed at the truth about aspects of reality. She maintains that if philosophy is "on par" with the sciences, then we end up with a "proliferation of fanciful views that seem like either bad science or wild speculation, and no idea how to choose among them" (2015, 20). On the other hand, if one insists that philosophy's role lies in conceptual work describing how we think about various topics, we end up with "a rather parochial and limited conception of philosophy" (20).

us to understand logic similarly to ethics as a "normative science" with laws that prescribe how one ought to think (Steinberger 2016). Philosophical work on paradoxes and puzzles tells us what premises we should revise, while parts of epistemology are concerned with how we should reason under conditions of uncertainty, how we should acquire evidence, and when we should count someone as possessing knowledge. Parts of philosophy of science explore what methodologies should be employed to generate data and what conclusions should be drawn from them. Conceptual analysis not only determines the contours of concepts (belief, free will, personal identity, or knowledge) but also informs us about what conclusions we should draw about various topics, given the contours of our concepts (Thomasson 2015).

3.1 | Challenges to the second line of argument

Thinking of philosophy as a normative discipline offers assistance in clarifying some of its particular strengths and possible contributions to science. However, it does not provide particularly strong support for DV. First, one may argue that it relies on a *derived notion of normativity* on which many sciences will qualify as normative. Consider Aristotle's doxastic law of noncontradiction, according to which it is impossible to hold the same thing to be F and not to be F. In itself, the law of noncontradiction is a descriptive claim from which it does not follow that one ought to think in conformity with it. One can derive explicitly prescriptive claims (you ought not to believe that x is F and not F) only by adding a normative claim, namely, that violating the law will prevent one from getting to the truth, which is a bad thing. Consequently, the normative force derives not from the logical principle but from a statement from outside of logic. If normativity is understood in this derived sense, then normativity is ubiquitous. For example, consider the claim that "medical scientists have established that antibiotics do not affect the course of the seasonal flu." Nothing normative follows from this claim, but we may—and typically do—add the normative claim from outside of medicine that one ought not to take medication that is shown to be ineffective for a condition.

Instead of the derived notion, proponents of DV can make the stronger claim that philosophy is normative in a nonderived sense. The claim could take on different shapes, but one possibility is that concepts in philosophy are normative in the sense that they can be fully understood only with recourse to normative terms. For example, we may understand validity in descriptive or normative terms.

> (a) (DESCRIPTIVE): an inference from premises P to conclusion C is valid iff it is impossible for the premises P to be true and the conclusion C nevertheless to be false.
>
> (b) (NORMATIVE): an inference from premises P to conclusion C is valid iff one ought not to believe P without believing C.

In contrast to (a), (b) implies that validity cannot be fully understood without grasping its normative implications, which directly reflects that accepting an argument as valid normatively constrains an agent's doxastic attitudes. Without going into further questions about normativity in logic, the important upshot is that, just like derived normativity, nonderived normativity is not restricted to philosophy.[6] As an example, consider the notion of evidence, which can be analyzed in normative terms, in terms of what conclusions we should draw from it. Thus, we may say that E is strong empirical evidence against a scientific hypothesis H iff one ought not to believe H while at the same time believing E. Accepting E as evidence normatively constrains an agent's doxastic

[6]This example draws on debates about whether logic can be a normative discipline (see Steinberger 2016).

attitudes, and grasping E's implications is necessary to understand the concept E as something that confers justification for belief. This brings to the fore that "evidence" and "reason" (to believe) are quasi synonymous, the main difference being that evidence cannot occur in the plural (a mass noun) while reason can (a count noun) (Kelly 2016). Overall, the idea of philosophy as a normative discipline does not offer strong support for DV.

4 | THE CONTINUITY VIEW (CV) AND THE CHARGE OF SCIENTISM

Having assessed two lines of argument in the philosophical literature that have been deployed to support DV, we may now take a brief look at the alternative view, the *Continuity View* (CV). CV maintains that science and philosophy are best seen as located on a continuum of inquiry that aims at systematic knowledge about a subject matter. This is consistent with the intuitively appealing view that in spite of numerous differences both philosophy and science ultimately attempt to answer an urge to attain an increasingly profound and systematic understanding of the world (Hempel 1966, 2; Williamson 2018). Importantly, CV denies that the methods used in philosophy are unique to philosophy and that they grant access to some distinct realm of truth that is inaccessible to science.[7] Philosophical work uses tools that scientists also rely on (for example, argumentation, logic, conceptual analysis), but philosophers possess unique expertise in deploying them in a meticulous manner (Laplane et al. 2019, 3950). To be clear, while CV locates science and philosophy on a continuum of inquiry, it does not imply the stronger thesis that philosophy *is* science or that *all* philosophy is continuous with science.

While DV is not optimistic about the chances of productive cooperation across the disciplines, CV is more consistent with the ongoing fruitful interaction between science and philosophy. On the one hand, philosophical work has influenced empirical research and theory in areas that include artificial intelligence, cognitive science, evolutionary psychology, and neuroscience.[8] On the other hand, scientific findings have had direct philosophical significance.[9] For example, physicalist views in the mind-body debate appealed to a theory from physics about the casual closure of the physical (that is, all physical events have sufficient physical causes) (Oppenheim and Putnam 1958; Papineau 2020), while empirical studies on impairment in psychopathy had a direct impact on the moral sentimentalism versus rationalism debate (see, e.g., Prinz 2007).

Before going further, we need to consider an objection to CV. Dummett argues that the claim of continuity amounts to *scientism*, thus having "the disposition to regard the natural sciences as the only true channel of knowledge" (2010, 35). This is particularly unsettling because in recent years similar ideas have been expressed by some leading scientists who also maintain that science exhibits a universal competence and can offer a complete account of everything (see, e.g., Hawking and Mlodinow 2010). In order to deal with the charge of scientism, we may start by clarifying that it may proceed in two ways, based on a restrictive or a permissive conception of science. But neither of these possibilities turns out to be promising.

[7]The term "continuity" is often associated with Quine's work, which is motivated by his rejection of the analytic-synthetic distinction and by his denial of any a priori ground ("first philosophy") outside science that may justify it.

[8]The philosopher Jerry Fodor's work on modularity is such a case. As is Daniel Dennett's work, which has influenced the development of the false-belief task, widely deployed in evaluating cognitive developmental stages in children, assessing social skills in great apes, and explaining aspects of ASD (see Laplane et al. 2019).

[9]For instance, the success of Newton's work propelled the philosophical discussion on free will and determinism, while advances in computer science have inspired functionalism in philosophy (Appiah 2003, 128).

If the charge of scientism is based on a narrow conception of science as being empirical (that is, constitutively based on observation and experiment), then it is inconsistent and clearly not what the CV proposes. First, as we have seen, reflection on the status of formal sciences reveals that observation and experiment are not necessary for science. But even if they were, philosophy might qualify as empirical, at least if one accepts the previous depiction of the nature of thought experiments. Second, on a narrow conception of science, it is not difficult to find questions that science is not equipped to answer. Questions about the nature of causation, types of valid inference, the permissibility of killing, justified beliefs, and the ontological status of numbers do not admit answers found through observation and experiment. Third, scientism fails by its own standards, because it relies on a hypothesis about science that cannot be deduced by logical methods from elementary truths and for which there is no empirical (experimental or statistical) support. It suggests that we should not believe any proposition that cannot be scientifically supported, but then questions arise about why we should believe that very proposition, since it cannot itself be scientifically supported. Worse, if scientism is to be believed, then scientific inquiry has gone awry, because it relies on a scientific method that is not itself scientifically supported. It seems safe to conclude that if the objection is stated with a narrow conception of science in mind, then it fails.

If the charge of scientism is based on a more permissive conception of science, according to which observation and experiment are not necessary conditions for science, then the reply follows a different path. On a more permissive conception, forms of philosophical work could in principle count as science. But if so, then proponents of CV could simply accept the label "scientism." This opens up another sort of objection, maintaining that philosophy is continuous with science, but it (or at least a major part of it) is *bad science*. For such a claim to get off the ground, one would have to identify criteria for science other than observation and experiment. If so, then one's best bet is probably going to be some epistemic virtue like systematicity. But then someone committed to CV need not disagree.

5 | CV AND A NORMATIVE PHILOSOPHY OF SCIENCE

Our investigation of DV and CV has highlighted continuities between philosophical and scientific inquiry while highlighting some special normative competences that philosophical work can display. One crucial advantage of CV is that it allows for holding on to the view that philosophy is a normative discipline, but without implying that the normative aspects that it explores are somehow inaccessible to science. The insights of our investigation can be used to briefly outline a particular philosophical engagement with science that focuses on normative aspects.

Of course, many philosophers of science have engaged in normative work, exploring science not merely as what it is and how it proceeds but also as what it ought to be and how it ought to proceed. Some philosophy of science engages in an evaluative endeavor with the aim "to distinguish good science from bad, better scientific practices from worse" (Sober 2008, xiv), and work in this area is increasingly based on extensive descriptive analyses of scientific practice (Kaiser 2019). For example, instead of merely offering a descriptive analysis of causal and explanatory claims in the sciences, perhaps clarifying their criteria of application, some use the descriptive analysis for making normative recommendations with respect to "what one ought to mean by various causal and explanatory claims" (Woodward 2003, 7). Nonetheless, while normative work in philosophy of science has made progress in making explicit standards by which scientific theories and claims ought to be evaluated, it has tended to focus on issues in epistemology and metaphysics, often ignoring the normative layers in science that stem from the social context of science and its embeddedness in societies.

The insights gained in the first two parts of this paper allow for outlining a more comprehensive picture of such normative layers as an integral part of science without claiming that it adopts

some privileged viewpoint outside science. Such an approach does not exclude traditional themes in the philosophy of science from its domain of interest, but it aims to understand them within a larger framework of science as embedded in society. Aiming to offer a comprehensive view of normativity as an integral part of science, its task is to show how *several levels of normativity* intertwine in a particular scientific field. We may distinguish between three levels.

The *first level* concerns, for example, the aims that propel a scientific field. The articulation and critical assessment of such aims are continuous with scientific activity but benefit from philosophical expertise in bringing implicit assumptions and norms to the surface. Identifying aims that are decisive for an informed reflection about the direction in which science should proceed is crucial. First, setting the general priorities of scientific research turns on questions about what a society most needs to know, which requires taking a stance on the most fundamental needs, aspirations, and values of the societies in which science is embedded. Philosophy can make a crucial contribution here, assisting debates about the appropriate aims of science. Second, the aim of science (whether it is truth, knowledge, understanding, or something else) will set different standards for what counts as progress. For example, if science follows the fundamental aim of offering true statements about the world, then its progress is assessed in terms of how successfully this aim is realized. But given the vast number of truths attainable, it is obvious that science selects what the *important* truths worth pursuing are (Kitcher 2001). Because this process involves reflecting on reasons for thinking what it is that makes something an important truth (that is, what it is that makes it *valuable*), philosophical reflection on the relevant epistemic values (for example, truth conduciveness, avoiding falsity) and practical values (for example, autonomy, justice) will be decisive for understanding progress in science.

The *second level* of normativity concerns the nature of scientific knowledge and the methods of acquiring knowledge in science. Science is seen as offering a reliable basis for decision-making not because of the epistemic and moral virtues of scientists but because science pursues a knowledge-producing inquiry that is superior to commonsense knowledge. A step toward determining how best to achieve the aim of scientific inquiry is to attain greater clarity about what it is that distinguishes science from commonsense knowledge. But to effectively pursue the aim of science, second-level concerns do not only include addressing the nature of the epistemic norms of scientific inquiry. They also concern whether these epistemic norms align with practical norms that derive from the aim of scientific inquiry. Here, philosophy not only helps to explore epistemic norms governing how we ought to form beliefs or behave as inquirers, it also comprehends the practical sources of epistemic norms that explain why we ought to care about them (see, e.g., Kornblith 1993 and 2002).

The *third level* of normativity concerns the nature of central concepts in scientific fields. Normative philosophy of science does not merely describe the use of the relevant concepts in scientific practice, it also offers a critical reconstruction. Moreover, the descriptive analysis may reveal that certain concepts used in the sciences are not as neutral with respect to values as it may first seem. For example, in medicine, "health" and "disease" may turn out to be value-laden concepts, the understanding of which might require grasping both their descriptive and their evaluative aspects. Complementing answers to first-level questions regarding the aim of a certain scientific field, such analyses will enable critical reflection on whether these concepts are suitable for the purposes of inquiry and will explore whether there is reason for epistemic or emancipatory revision.

The approach suggested here is thus concerned with a comprehensive picture of normative aspects that includes three interconnected levels of normativity. While a detailed outline of all three levels is beyond the scope of this paper, the remaining part of the paper offers an example from the third level of normativity, which concerns philosophical work on central concepts in scientific fields. The aim is to illustrate how normative philosophy of science can help reconstruct, understand, and revise concepts, but also how such contributions may have consequences for first- and second-level concerns.

6 | EPISTEMIC AND EMANCIPATORY REVISION OF CONCEPTS

Normative philosophical work is sometimes *revisionist*, going beyond using conceptual analysis and reflecting on how we ought to reason in light of extant conceptual structures. It is revisionist because apart from informing us about what parts of our conceptual structure *ought* to be, it also helps us to replace defective conceptual structures. Consistent with CV, the claim is not that such revisionism is unique to philosophy. Scientists often replace concepts (for example, concepts of folk biology) with concepts that better suit their theoretical purposes (Eklund 2014). Nonetheless, qua conceptual work, philosophy has a particular expertise on this front (Cappelen 2018, 5; Chalmers 2018).

An early example of revisionism is found is the work of Rudolf Carnap, who, deviating from standard conceptual analysis, introduced the term "philosophical explication." As Carnap puts it, "The task of explication consists in transforming a given more or less inexact concept into an exact one or, rather, in replacing the first by the second" (1950, 3). Hence, the aim of explication is not so much to discover meaning, extension, or criteria of application while respecting conventional usage as it is to provide innovative definitions that are more suitable than the imprecise existing concept (Schupbach 2015; Kitcher 2008).[10] Explication thus comprises revision or replacement in lieu of additional elucidation, which means that the procedure diverges from a lexical definition (Loomis and Juhl 2006).

Carnap's work has served as a model for contemporary work under the label "conceptual engineering," which goes beyond analyzing extant concepts to assessing whether these concepts are the best tools for understanding the relevant aspects of reality and considering revision or replacement in case the answer is in the negative (Eklund 2014 and 2015; Cappelen 2018; Haslanger 2000; Burgess and Plunkett 2013).[11] Stretching Carnap's framework, we may distinguish between *epistemic* and *emancipatory revisionism*.

Epistemic revisionism offers justification on epistemic grounds. It is thus propelled by an effort to improve concepts that suffer from the deficiency of "inexactness" and therefore lead to less true and illuminating generalizations. For example, Carnap (1950, 5–6) highlights that within zoology the vague and broad concept "fish" was replaced by the scientific concept "piscis." This leads to an epistemic gain, because creatures denoted by "piscis" have more properties in common than "fishes," and there are more instructive generalizations that involve "piscis" than "fish."[12] For a contemporary example, consider "race." Some have argued that it presupposes "racialism," according to which humankind naturally divides into racial groups, the members of which inherit cognitive, emotional, physical, moral, and cultural features that they do not share with members of any other race (Appiah 1996). On this basis, epistemic revisionism would conclude that since racialism is empirically false, the term "race" has an empty extension and might be eliminated.[13]

[10]As Quine (1960, 258) puts it, the goal is not to make explicit hidden meanings or clarify unclear expressions but rather to "supply lacks." Clarification is involved at an initial stage, but the main task is to "fix on the particular functions of the unclear expression that make it worth troubling about, and then devise a substitute, clear and couched in terms to our liking, that fills those functions" (Quine 1960, 258).

[11]In contrast to Cappelen, Chalmers (2018) thinks that conceptual engineering is broad and covers *de novo conceptual engineering*, which does not particularly try to fix or replace other concepts. Examples include access consciousness, epistemic injustice, and belief.

[12]Another example that meets Carnap's (1950, 7–8) four conditions for a successful explication is the replacement of "salt" with "NaCl."

[13]Epistemic revisionism characterizes some recent work maintaining that paradoxes and infertile debates are sometimes symptoms of an underlying defect in the concept itself. Some argue that "truth" gives rise to paradoxes and contradiction not because of faulty reasoning or premises but because "truth" is incoherent. It generates paradoxes and is not useful in explanations, and that is why it should be replaced by "ascending truth" and "descending truth" (Scharp 2013). Others have argued that the notion of free will is incoherent and should be eliminated, because it can be rendered incompatible both with determinism and with indeterminism (van Inwagen 2008, 327–28). Seemingly compelling arguments on both sides could also indicate that interlocutors might take "freedom" to express closely related, but different, properties. In cases of "conceptual pluralism," contradicting claims are not necessarily genuine disagreements and could amount to verbal disputes (Chalmers 2011; 2018; and 2015).

In other cases, concepts might require understanding descriptive and evaluative aspects as a whole. For example, the term "validity" might be descriptive (that is, picking out features of the world), evaluative (that is, providing reasons for action), or both, expressing a "thick concept" with both evaluative and nonevaluative content. On the latter possibility, "validity" might be akin to "murder," thus expressing a concept that has evaluative content (for example, *wrong*) but also nonevaluative content (for example, *premeditated killing*). The concepts "health" and "disease" could function in the same manner. For example, "disease" might express a concept with both evaluative content (for example, *harm*) and nonevaluative content (for example, *part-dysfunction*). Explications of these kinds of normative features constitute valuable contributions, in part because they have consequences for second-level concerns. Clearly, whether a scientific term has an empty extension or contains descriptive and evaluative aspects will have an influence on the nature of the information that studies using these terms are able to offer.

Emancipatory revisionism offers justification on non-epistemic grounds. For example, some terms appear to serve the goals of explanation and prediction (for example, natural kind terms), but they actually furnish pseudo-scientific legitimacy to social practices that sustain domination and oppression. Using the example of "race," one might argue that existence of races presupposes not only "racialism" but "racism" as well (van den Berghe 1967). The objective physical differences tied to skin pigmentation only become relevant if something like racism marks and elevates them. In that case, conceptual analysis exposes that "race" has functions that conflict with values that we endorse, making it a target for *emancipatory revisionism*. The revision is primarily legitimated not by epistemic deficits but by considerations about what the concept ought to be or what extensions it ought to have, for example, in order to promote social justice.[14] In this sense, revisionism is not merely conceptual, that is, about the concepts "race" and "mental disorder," but about race and mental disorder: ultimately, revisionism aims to *ameliorate the world* by ameliorating concepts. But even if this turns out not to be the case, emancipatory revisionism can offer valuable contributions, in part because the normative aspects it explores have consequences for first- and second-level concerns. For example, if the aim of science is to increase our understanding of the world in a way that enhances our agentive capacities with respect to controlling both our environment and our basic self-determination, then pursuing the aim of science also requires revising scientific terms that promote domination and oppression.

7 | CONCLUDING REMARKS

The massive progress in science and the improved comprehension of its social embeddedness raise questions about the nature of philosophical inquiry itself and its relation to science. Some philosophers defend the Discontinuity View (DV), and the first part of the paper was dedicated exploring two lines of argument in support of this view. Subsequently, in the second part, the paper introduced the Continuity View (CV) and defended it from the charge that it amounts to a form of unattractive scientism. There are surely clear methodological, stylistic, and other differences, but these differences do not warrant denying continuity, especially since we find a similar diversity within those areas of inquiry that are traditionally acknowledged as proper sciences. The critical engagement in the first two parts of the paper has shed light on continuities between philosophical and scientific inquiry while underlining special normative competences of philosophical work. In the last part of the paper, these insights were used to offer a brief outline of a normative approach to philosophy of science. Such a normative approach,

[14]There are many other examples. Consider "woman," which seems to express the concept of an adult human female. Haslanger (2000) has argued that "woman" is primarily used to subordinate people based on their stereotypical female characteristics. Haslanger's project aims to oppose subordination by making the concept explicit.

if appropriately developed, would offer a comprehensive view of normativity as a vital part of science.

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