DOES RELATIVISM HAVE A PLACE IN SCIENCE?

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Abstract
Western philosophers, especially foundationists developed a few epistemological theories that inspire most of today's controversies in philosophy of science. Two of these theories are central to this paper. The first is the belief that there exists an absolute, universal, trans-historical and transcultural truth. The second is that there is also universal standards for discovering this truth. Consequently, the history of Western philosophy may be understood to a considerable extent as the quest for both truth and the appropriate method of attaining it. With the rise of modern science and its remarkable achievements, many scholars come to regard the scientific method as the hallmark of scientific rationality. This naturally raises the question of whether relativism has any legitimate place in science. The traditional answer was negative, since science was assumed to be governed by universal standards that excluded relativism. Before the second half of the twentieth century, this assumption was largely taken for granted and remained virtually unchanged. Subsequently, however, the notion of a universal standard of scientific rationality came under sustained criticism, making the question of the place of relativism in science one of the most debated issues in contemporary philosophy of science. Deploying the library research approach for data collection and the analytic method for data interpretation, the paper examines this debate through Popper's and Feyerabend's methodological lenses. The paper argues that Popper was correct in emphasizing the indispensability of objective standards for the critical evaluation of scientific theories. However, his position is weakened by his failure to acknowledge that methodological monism obstructs scientific progress. Conversely, although Feyerabend rightly demonstrates that methodological monism can hinder scientific innovation, his rejection of universally binding standards ultimately weakens the rational basis for distinguishing between competing theories. The paper concludes that relativism has a legitimate place in science only insofar as it promotes methodological pluralism, critical reflection, and openness to alternative perspectives. However, it cannot replace objective standards of criticism without undermining the rational character that makes science a distinctive and reliable means of acquiring knowledge.
Keywords: Relativism, Scientific Rationality, Karl Popper, Paul Feyerabend, Critical Rationalism Methodological Anarchism

Introduction

Throughout the history of Western philosophy, many philosophers believe that truth is universal and objective truth and that the primary aim of philosophy, and indeed of all scholarship, is the discovery of this truth. The remarkable achievements of modern science, particularly following the Scientific Revolution of the seventeenth century, reinforced this conviction. For many thinkers, the success of science appeared to demonstrate that the long-standing philosophical search for certainty had found its most reliable expression in the scientific enterprise.[1]The scientific method, which was widely credited for these achievements, came to be regarded as the 'philosopher's stone' that Western philosophers had sought for centuries.[2] This assumption, however, was increasingly challenged in the twentieth century by philosophers of science who questioned the existence of a single universal scientific method or a fixed model of scientific rationality. It is against this background that the question of whether relativism has a legitimate place in science arises to become one of the most significant, controversial, and enduring issues in contemporary philosophy of science.[3]

At the centre of the debate is the problem of scientific rationality: are there objective and universal standards by which scientific theories can be evaluated, or are such standards themselves contingent upon historical, culture, and social contexts? The attempts to address this question have generated divergent views of scientific methods. While defenders of scientific objectivity argue that science grows through rational methods capable of distinguishing truth from error, critics argue that scientific practice is too historically and socially conditioned to be governed by single universal methodology. Consequently, the debate over relativism raises fundamental questions about the nature of scientific knowledge, the criteria of theory choice, and the possibility of objective truth. As Larry Laudan observes, "the central question is not whether science is rational, but what standards of rationality are appropriate for assessing scientific practice."[4]

Few philosophers embody this controversy more clearly than Karl Popper and Paul Feyerabend. Popper defended science as a fundamentally rational enterprise grounded in critical resting using the principle of falsification. According to him, the objectivity of science does not rest upon certainty but upon the critical

evaluation of competing hypotheses. Feyerabend, by contrast, challenged the assumption that scientific progress follows any fixed methodological rules. Drawing upon instances from the history of science, he argued that many of the most significant breakthroughs occurred precisely because scientists departed from accepted methodological principles. His famous rejection of methodological monism is at the heart of his epistemological relativism and the scene of his conflict with monists like Popper. Centrally, the disagreement between Popper and Feyerabend represents more than a dispute over scientific methods. It reflects two competing visions of nature and growth of scientific knowledge. Whereas Popper seeks to preserve the rational and objective character of science through universal standard of criticism, Feyerabend emphasizes methodological diversity, historical contingency, and intellectual freedom as indispensable conditions for scientific progress. Therefore, their contrasting perspectives are at the centre of contemporary discussions on the status of scientific knowledge and the extent to which relativistic considerations should influence scientific inquiry.

This paper contends that while Feyerabend correctly exposes the dangers of methodological dogmatism and demonstrates the importance of pluralism in scientific practice, Popper's conception of critical rationality is indispensable for preserving the objective aspirations of science. Accordingly, the paper argues that relativism has a legitimate place in scientific inquiry. It serves as a valuable corrective to methodological absolutism by encouraging openness to alternative approaches and critical reflection on established practices. However, relativism cannot replace objective standards of criticism without undermining the rational foundations that distinguish science from mere opinion or belief. The paper is organized into four major sections: the introduction, Popper's defense of scientific rationality, Feyerabend critique of scientific rationality, a critical evaluation and conclusion. Collectively, these sections are logically organized to demonstrate that scientific rationality and scientific relativism are not mutually exclusive but can be understood as complementary dimensions of scientific progress.

Popper's Defense of Scientific Rationality

Karl Raimund Popper, the Austria born British philosopher of science and leading advocate of critical rationalism, was one of the most influential defender scientific rationality in the twentieth century. Rejecting both the inductivism of the members of the Vienna Circle and the skepticism of the epistemological relativists, Popper contends that science is fundamentally a rational enterprise distinguished by its commitment to criticism rather than verification. According to him, scientific knowledge does not grow by accumulating confirming instances but by proposing bold explanatory hypotheses that are rigorously subjected to attempts at refutation. For Popper, therefore, rationality does not consist in establishing the certainty of scientific theories but in exposing them to severe criticism. It is this critical attitude that distinguishes science from both non-science and pseudo-sciences and enables science to progress despite its inherent fallibility.1

At the foundation of Popper's critical rationalism is the principle of falsifiability. Applying the principle, a theory is scientific not because it has been conclusively tested but because it is capable of being tested and potentially shown to be false through empirical observation. Scientific theories are hence provisional explanations whose credibility depends upon their capacity to withhold critical examination. For Popper, no amount of positive evidence can conclusively establish the truth of a universal scientific law, whereas a single genuine counter-instance may require its revision. Consequently, the growth of scientific knowledge depends not upon verification but upon the continual elimination of error through rational criticism.[5] Popper summarizes this conception of scientific progress in one of his famous quotes:

> The way in which knowledge progresses, and especially our scientific knowledge, is by unjustified (and unjustifiable) anticipations, by bold guesses, by tentative solutions to our problems, by conjectures. These conjectures are controlled by criticism, that is, by attempted refutations, which include several critical tests. They may survive these tests, but they can never be positively justified: they can neither be established as certainly true nor even as 'probable.'[6]

In Popper's understanding therefore, criticism is the engine of scientific progress and the principal safeguard against dogmatism

Related to Popper's principle of falsifiability is his doctrine of objectivity of knowledge. Based on this he rejects the view that scientific knowledge depends upon the beliefs, psychological convictions, or cultural perspectives of individual scientists. Instead, he argues that once formulated, scientific theories acquire an objective existence as products of human though that are open to public examination and criticism. Their acceptance or rejection should therefore depend not upon the authority of those who propose them but the strength of the critical arguments and empirical tests to which they are subjected. Scientific objectivity is thus achieved through intersubjective criticism rather than personal certainty or social consensus. As captured by Popper, "the objectivity of scientific statements lies in the fact that they can be inter-subjectively tested."[7] Universal standards

of criticism therefore makes it possible for competing theories to be rationally compared regardless of their historical or cultural origins.

From this purview, Popper firmly rejected epistemological relativism. Although he acknowledges that all scientific knowledge is provisional and fallible, he insists tht fallibalism does not entail relativism. The absence of certainty does not imply the absence of rational standards for evaluating competing theories. On the contrary, critical testing provides objective criteria by which theories may be compared according to their explanatory power, empirical content, and resistance to refutation. Consequently, scientific disagreement is not resolved through appeals to cultural preferences, social authority, or intellectual fashion, but through rational criticism and empirical scrutiny. Popper's philosophy therefore preserves the objectivity of science without claiming infallibility, offering a conception of scientific rationality that remains one of the strongest philosophical responses to relativism.

Feyerabend's Critique of Scientific Rationality and Defense of Epistemological Relativism

Paul Feyerabend, the Austria-born philosopher of science emerged as one of the most or perhaps, the most radical critic of the rationalist notion of scientific method propagated by philosophers such as Popper. His criticism of the ideological image of rationality associated with science was so profound earning him the appellation "the worst enemy of Science". Newton-Smith called his *magnum opus, Against Method*, the most "lively or entertaining critique of the scientific method."5

While acknowledging the remarkable achievements of modern science, Feyerabend questioned the assumption that scientific progresss is governed by a sing, universal method applicable to all contexts of inquiry. In his view, the history of science demonstrates that many of the greatest advances were achieved not by strict adherence to methodological rules but by creative departure from them. Hence, he rejected methodological monism and argued that attempts to impose a universal scientific method misrepresent both the historical development and dynamic character of scientific inquiry.[8]

This criticism culminated in Feyerabend's doctrine of 'epistemological anarchism, according to which no methodological principle possesses universal validity. His position on this is informed by his belief that scientific progress often requires scientists to challenge accepted procedures, retain apparently falsified theories, and employ approaches that prevailing methodological standards would initially reject. For this reason, Feyerabend maintains that methodological freedom, rather than methodological conformity, best explains the historical growth of scientific knowledge.[9] This position is most famously expressed in *Against Method*:

> The idea of a method that contains firm, unchanging, and absolutely binding principles for conducting the business of science meets considerable difficulties when confronted with the results of historical research. We find, then, that there is not a single rule, however plausible and however firmly grounded in epistemology that is not violated at some time or other. It becomes evident that such violations are not accidental events, are not the result of insufficient knowledge or of inattention which might have been avoided. On the contrary, we see that they are necessary for progress.[10]

In this passage, Feyeraband seeks to demonstrate that rigid methodological prescriptions fail to capture the complexity of actual scientific practices. To support this claim, he repeatedly appeals to historical events, particularly the Copernican Revolution and Galileo's defense of heliocentrism. He argues that Galileo's success cannot be explained solely by conformity to accepted standards of empirical testing or logical demonstration. Instead, Galileo employed rhetorical persuasion, thought experiments, selective use of evidence, and even arguments that would not satisfy later methodological criteria. Such examples suggest that scientific progress often depends upon intellectual strategies that transcend the rigid methodological rules favoured by traditional philosophies of science. The history of science therefore reveals that methodological diversity, rather than methodological uniformity, has been one of the principal sources of scientific progress.

Feyerabend extends this criticism by challenging the privileged status often accorded to modern science. He claimed that science should be regarded as one intellectual tradition among others rather than as the exclusive arbiter of rationality or truth. His position encourages openness towards alternative forms of knowledge and rejects the assumption that scientific methodology possesses universal authority over every domain of inquiry. Although Feyerabend does not simply maintain that all beliefs are equally true or equally scientific, his rejection of universal methodological standards significantly weakens the possibility of objective criteria for theory choice. Once scientific rationality is detached from universally applicable standards of evaluation, competing theories become increasingly difficult to assess by reference to common criteria. In this respect, Feyerabend's

methodological pluralism opens the door to epistemological relativism by emphasizing the contextual and historical character of scientific reasoning.

Critical Evaluation: Does Relativism have a Place in Science

Karl Raimund Popper's greatest contribution to the philosophy of science is his defense of scientific objectivity without appealing to certainty. Unlike the logical positivists, who sought certainty through verification, Popper recognized that all scientific knowledge is provisional and subject to revision. Nevertheless, he maintained that the absence of certainty does not entail absence of rationality. Scientific theories remain objectively assessable because they are exposed to rigorous criticism and empirical testing. This emphasis on criticism preserves science as self-correcting enterprise in which theories compete according to their explanatory power and their capacity to withstand attempts at falsification. In this respect, Popper provides a compelling response to epistemological relativism by demonstrating that objectivity of evaluation need not depend upon infallible foundation.[11]

Closely related to this achievement is Popper's principle of falsifiability, which has continued to provide an important means of distinguishing scientific inquiry from pseudo-science. Although philosophers have contested whether falsifiability adequately captures every aspect of scientific practice, the principle remains valuable in requiring scientific theories to expose themselves to the possibility of refutation. Without such standards, scientific inquiry would lose its capacity to discriminate between empirically grounded explanations and claims insulated from criticism. Popper's instance upon rational criticism therefore safeguards one of sciences' defining characteristics: its willingness to subject even its most successful theories to continual scrutiny. As Popper observes:

> We do not know: we can only guess. And our guess are guided by the unscientific, the metaphysical (though biologically explicable) faith in laws, in regularities which we can uncover (discover). Like Bacon, we might describe our own contemporary science (the method of reasoning which men now apply to nature), as consisting of 'anticipations, rash and premature' and. 'premature' and 'prejudice.' But we differ from Bacon in that we regard these 'anticipations' as our indispensable speculative instruments, and in that we expose them to the severest criticism of which we are capable, instead of trying to avoid them.[12]

From the foregoing, it is deducible that Popper's philosophy preserves both the creativity and the objectivity of science by ensuring that innovation remains accountable to rational evaluation.

Nevertheless, Feyerabend's criticism of methodological monism exposes genuine weaknesses in rigid conceptualizations of scientific rationality. His careful examination of the history of science shows that scientific revolutions rarely conform to fixed methodological prescriptions. Scientists frequently retain theories despite apparent falsifying evidence, employ imaginative hypotheses unsupported by existing observations, and adopt uncongenial strategies that later prove intellectually fruitful. By emphasizing these historical realities, Feyerabend reminds philosopher that methodological rules should describe scientific practice rather than dictate it in advance. His philosophy therefore, serves as an important corrective to excessive methodological rigidity and encourages a more historically informed understanding of scientific development.[13]

Also important is Feyerabend's defense of methodological pluralism. Scientific creativity often depends upon the coexistence of competing theories, diverse research traditions, and uncongenial approaches that challenge established assumptions. Intellectual progress is frequently stimulated by disagreement rather than conformity. In this respect, Feyerabend successfully warns against transforming scientific methodology into an inflexible orthodoxy that suppresses innovation and marginalizes alternative perspectives. His critique remains particularly relevant in contemporary discussions concerning interdisciplinary research, indigenous knowledge systems, and the social dimensions of scientific inquiry. Nevertheless, his rejection of universal methodological standards raises an important philosophical difficulty. If every methodological framework is regarded as equally legitimate, the criteria by which competing theories are rationally evaluated become increasingly uncertain, thereby risking the collapse of scientific objectivity into epistemological relativism.

The strengths of both philosophers therefore suggest that neither methodological absolutism nor unrestricted relativism provides an adequate account of scientific inquiry. Popper rightly insists that science requires objective standards of criticism if it is to distinguish reliable knowledge from speculation, while Feyerabend convincingly demonstrates that such standards should not become rigid methodological prescriptions that inhibit scientific creativity. The history of science supports both insights demonstrating that scientific progress requires imaginative departure from established assumptions, yet these innovations ultimately achieve scientific

legitimacy only through sustained critical evaluation. Creativity without criticism degenerates into speculation, whereas criticism without creativity produces intellectual stagnation

What comes out strongly from this evaluation is that relativism has a legitimate but carefully circumscribed place in science. Properly understand, relativism functions as a reminder that scientific inquiry is historically situated, methodologically diverse, and continually open to revision. It cautions against the dogmatic assumption that any single methodological framework possesses universal and unquestionable authority. However, relativism ceases to serve science once it denies the possibility of rational comparison, objective criticism, or shared standards of evaluation. Scientific knowledge remains possible precisely because methodological openness is balanced by critical rationality. Accordingly, Feyerabend's challenge to methodological dogmatism should be accepted as an important corrective to scientific practice, while Popper's conception of critical rationalism remains indispensable for preserving the objective aspirations that distinguishes science from other forms of inquiry. Relativism therefore has a place in science only in so far as it enriches scientific inquiry without displacing the rational standards upon which scientific knowledge ultimately depends.

Conclusion

The astonishing achievements recorded by science since the seventeenth century convinced many scholars that the scientific method, which provides an absolute universal criterion for testing the validity of scientific theories, is the hallmark of rationality that distinguishes science from other methods of inquiry. It is from this background that the question of whether relativism has any legitimate role to play in scientific investigation arises. Nevertheless, to most philosophers, it appears unlikely that relativism would have any role in science because while science has a universal criterion of testing validity, the relativists hold that all such criteria do not exist and that all scientific theories are equally valid. However, this assumption came under serious scrutiny in the second half of the twentieth century thereby bringing the question of the nexus between science and relativism to the fore and making the issue one of the most debated in twentieth cum twenty-first century mainstream philosophy of science.

This paper examined that debate through the contrasting framework of Karl Popper and Paul Feyerabend. Popper's philosophy shows that science derives its distinctive character from its commitment to critical rationality, falsifiability, and objective standards of evaluation. By insisting that scientific theories remain open to rigorous criticism and empirical testing, Popper provides a compelling account of how scientific knowledge can be both fallible and objective. Feyerabend on the other hand, challenges the assumption that scientific progress is governed by universal methodology. His historical analysis reveals that many of the most significant advances in science have resulted from methodological flexibility, intellectual creativity, and the willingness of scientists to depart from established rules. In this respect, his critique exposes the limitations of methodological dogmatism and highlights the importance of pluralism in scientific inquiry.

Overall, the analysis presented in this paper suggests that neither methodological absolutism nor unrestricted relativism offers an adequate account of scientific practice. Science requires objective standards if it is to distinguish reliable knowledge from mere opinion, yet those standards must remain sufficiently flexible to accommodate innovation, historical change, and the diversity of scientific practice. Relativism therefore has a legitimate place in science. It is valuable insofar as it promotes critical reflection, methodological openness, and resistance to intellectual dogmatism. However, when relativism denies the possibility of objective criticism or rejects the existence of shared standard for evaluating competing theories, it undermines the rational character that distinguishes science as a reliable means of acquiring knowledge. In the end, the enduring significance of the debated explored in this paper lies in not choosing Popper at the expense of Feyerabend or vice versa, but in recognizing that scientific development is best sustained through the complementary interaction of methodological openness and critical rationality.

References

1. F. Copleston, *A History of Philosophy (Vol. 3): Late Mediaeval and Renaissance Philosophy (Pt II)*. New York: A Division of Doubleday and Company, Inc. 1963, p. 89.
2. W. H. Newton-smith, The Rationality of Science, Routledge and Kegan Paul: London. Paperback, 1981, p. 1.
3. Paul Feyerabend, *Against Method: Outline of an Anarchistic Theory of Knowledge* (New York: New Left Books, 1975).
4. Larry Laudan, *Science and Values: The Aims of Science and Their Role in Scientific Debate* (Berkeley: University of California Press, 1984), 14.

5. Karl Popper, *The Logic of Scientific Discovery* (London: Routledge, 2002), 33-37.
6. Popper, *The Logic of Scientific Discovery*, 40-44
7. Karl Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge* (London: Routledge, 1963), 33.
8. Paul Feyerabend, *Against Method*, 4th ed. (London: Verso, 2010), 1-10
9. Feyerabend, *Against Method*, 17-23
10. Feyerabend, *Against Method*, 23.
11. Karl Popper, *Objective Knowledge: An Evolutionary Approach* (Oxford: Clarendon Press, 1972), 44-47.
12. Karl Popper, *The Logic of Scientific Discovery* (London: Routledge, 2002), 278.
13. Paul Feyerabend, *Against Method*, 4th ed. (London: Verso, 2010), 90–115.