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THEORETICAL STUDY OF "SCIENCE": HISTORY, PERSPECTIVES AND FACTS

Abstract

The nature and essence of scientific theories have long been debated among scholars and scientists. In this article, we analyze the subjective and objective elements that influence the formation of scientific theories and their interplay. We also examine the relationship between student persistence and the development of science and the role of diversity in scientific approaches and perspectives. Our conclusion emphasizes the importance of recognizing the complexity and diversity of the scientific method and the need to appreciate different scientific perspectives. Moreover, the article highlights the importance of critical thinking in overcoming obstacles such as political propaganda, ideologies, and religious lies in pursuing scientific truth. We also emphasize the importance of conducting scientific discussions to resolve any conflicts. Finally, we argue that complexity science and abstract thinking can provide valuable insights into various fields and phenomena, making science a powerful tool for understanding the world around us.
Purpose. This scientific article aims to explore the nature of scientific theories and the practice of science. The article will critically analyze the current state of scientific methodologies and

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perspectives and consider the influence of social, cultural, and historical factors on the scientific process. The article will also address the challenges faced by the scientific community in pursuing truth, including political propaganda, ideologies, and religious lies. The goal is to provide valuable insights into the scientific approach to life and to encourage the critical examination of scientific theories and practices.

Research methods. Literature review, monographic method, analysis and synthesis.

Results. The results of the scientific article suggest that scientists' subjective experiences and perspectives influence scientific theories and that the distinction between subjectivity and objectivism is not always clear-cut. Additionally, the practice of science is impacted by various social, cultural, and historical factors, and no single universal scientific method can be applied to all scientific disciplines. The study highlights the need to recognize and appreciate the diversity of scientific approaches and perspectives and to conduct research to investigate the relationship between student persistence and the development of science. The conclusion stresses the importance of critical thinking and overcoming obstacles such as political propaganda, ideologies, or religious lies in pursuing scientific truth.

Conclusions. This scientific article highlights the importance of considering subjectivity and various social, cultural, and historical factors in forming scientific theories. It also emphasizes the need to recognize the diversity of scientific approaches and perspectives and the importance of incorporating critical thinking in pursuing scientific truth. This article underscores that science is a light in a world of darkness, illuminating the path to knowledge and understanding, but political propaganda, ideologies, or religious lies often hinder its pursuit.

Keywords: scientific theories, subjectivity, objectivism, social and cultural factors, scientific thinking, world understanding.

JEL Classification: A11, A13.

INTRODUCTION

The experience of history has a significant impact on shaping our modern understanding of science and its future trajectory. Throughout history, the concept of science has undergone many transformations as discoveries and advances have redefined what we consider "scientific". These changes have affected how scientists approach their work and society views science.

For example, the Scientific Revolution of the 17th century was a time of significant change and progress in mathematics, physics, astronomy, and biology. This revolution was influenced by the political and economic climate of the time and the cultural values and beliefs of the European societies in which it took place. The resulting advances in science helped lay the foundation for the

modern scientific enterprise and continue to shape our understanding of the world today.

Similarly, the history of science is also marked by instances where political, cultural, or economic forces have hindered scientific progress or even led to the suppression of scientific ideas. For example, during the medieval period, the Catholic Church often suppressed scientific ideas that challenged its teachings and held back scientific progress.

The experience of history not only influences the formation of the modern understanding of science but also has a significant impact on its future. The history of science is replete with lessons that can inform and guide future scientific progress. For example, recognizing the negative consequences of past political interference in science can inform current debates about science funding and policy. In addition, historical experience also underscores the importance of promoting scientific literacy and encouraging public engagement in science so that future generations can continue to make informed decisions about the role of science in society.

In conclusion, historical experience plays a crucial role in shaping our modern understanding of science and will continue to influence its future. By learning from the past, we can work to ensure that science continues to progress ethically and responsibly and that its benefits are available to everyone.

1. LITERATURE REVIEW

Many modern and historical scientists have explored science comprehensively, such as: Chatterjee S. G., Kuhn, T. S., Roberts, L. J., Swabey, M. C., Dupré, J., Walstad, A., Kirsch, J. A. W., Cooper KM, Bucchi M, Holme, P., Bas Hofstra, Macallum, A. B., Herron, M. D, Rudra Prasad Ghimire.

Analyzing their work, we can note that scientists think about the nature of scientific theory, the historical framework of scientific discovery, the connection of science with the market, the role of subjectivity in research, the scientific process and its characteristics. Some prospective future study directions in this area might be included:

1. Investigate the link between social issues like money, resources, and competitiveness and scientific achievements.
2. Research on the interplay between creativity and diversity in science, as well as the potential consequences.

3. Investigate the impact of many elements, such as cultural influences, on scientific research and its outcomes.
4. Investigate the nature of scientific theory and its relationship to other areas of science philosophy, notably the heart of the scientific method and the role of subjectivity in science.

This body of research provides a comprehensive overview of the nature of the scientific enquiry, exploring its underlying principles, the role of subjectivity, the importance of diversity, and the need for critical evaluation of scientific theories and evidence. We will analyze their works and structure the information.

2. OUTLINE OF THE MAIN RESEARCH MATERIAL

The article by S. G. Chatterjee, titled "The Nature of Scientific Theory," is a brief review of the concept of scientific theory and its evolution over time (1). The author begins by discussing the common perception of scientific theories as merely provisional explanations, subject to modification or rejection based on new evidence. However, he argues that this view is too limited and fails to capture the true nature of scientific theories.

Chatterjee then goes on to examine the role of theories in scientific practice, pointing out that they serve not only as explanations but also as tools for guiding further research and experimentation. He argues that theories are more than just collections of facts; they embody a rich network of concepts and ideas that help shape our understanding of the natural world.

One of the critical points of the article is the author's claim that scientific theories are not simply constructed from empirical data but are instead shaped by a wide range of factors, including the historical context in which they were developed and the philosophical and cultural biases of the scientists who developed them. Chatterjee argues that scientific theories are not neutral representations of reality but are shaped by the subjective experiences and beliefs of the scientists who construct them. Furthermore, we fully agree with him that scientific theories are formed by the subjective experience of scientists and the way they see this world.

The article "Historical Structure of Scientific Discovery" by Thomas S. Kuhn is a classic work in the philosophy of science (2). The article provides a detailed analysis of the nature of scientific discovery and the role of paradigms in shaping scientific progress. The main argument presented by Kuhn is

that scientific progress is not linear but is characterized by periodic shifts in the dominant paradigm, which he refers to as "scientific revolutions". The author introduces and develops the theory of paradigms in science. The theory argues that scientific progress is not a linear accumulation of knowledge but occurs in cycles of "normal science" punctuated by revolutionary changes or "paradigm shifts".

One of the strengths of the paradigm theory is that it provides a more nuanced understanding of the process of scientific discovery, highlighting the role of social and historical factors in shaping scientific knowledge. Additionally, the theory acknowledges that accepting scientific theories is not solely based on empirical evidence but also involves social and political factors.

So, in our opinion, there are both ups and downs in science, and this is caused by many factors, such as:

1. The role of social and historical factors in shaping scientific knowledge.
2. The subjective nature of accepting scientific theories.
3. Political or religious propaganda.

Overall, paradigm theory remains a significant contribution to the philosophy of science and continues to be widely discussed and debated in academic circles. While it has its limitations, it provides a valuable framework for understanding scientific discovery's complex and dynamic process.

The article "THOMAS KUHN'S "THE STRUCTURE OF SCIENTIFIC REVOLUTIONS" by L. J. Roberts (2000) provides a comprehensive overview of Thomas Kuhn's theory of scientific revolutions, presented in his seminal book "The Structure of Scientific Revolutions" (3). In the article, Roberts presents a detailed analysis of Kuhn's theory, highlighting its essential elements and evaluating its strengths and weaknesses.

As noted by Roberts, one of the strengths of Kuhn's theory is its ability to provide a more nuanced understanding of scientific discovery. According to Kuhn, scientific development is not a linear and cumulative process but is characterized by periods of relative stability (normal science) punctuated by periods of revolutionary change (scientific revolutions).

In Kuhn's view, a scientific revolution occurs when a dominant paradigm, or dominant view of the world, is challenged by a new paradigm that better explains the available evidence. This new paradigm becomes the dominant view, leading to a fundamental change in how scientists understand a particular field of study.

Let us summarize the strengths of Thomas Kuhn's theory of scientific revolutions:

1. Provides a new and nuanced understanding of scientific discovery, emphasizing the role of paradigms in shaping scientific knowledge.
2. Recognizes that scientific theories are not solely based on empirical evidence but also involve social and historical factors.
3. Accounts for scientific revolutions and the resulting changes in scientific knowledge exist.
4. Explains why scientific theories are sometimes rejected and replaced by new theories.

Let us summarise the weaknesses of Thomas Kuhn's theory of scientific revolutions:

1. It has been criticized that scientific knowledge is subjective and dependent on the prevailing paradigm of a particular historical period.
2. It has been challenged by proponents of realism, who argue that scientific knowledge can have an objective basis independent of social and historical factors.
3. It has been criticized for not providing clear criteria for deciding when a scientific revolution has occurred.
4. It has been criticized for overemphasizing the role of paradigms and understating the importance of empirical evidence in scientific discovery.

Swabey M. C. (1927, p. 427) claims that science is not about subjectivism, based on the works of Dr. Carr, and it adopts the character of objectivism in its methods and ideals (4). Swabey M. C. claim that science is not subjective and adopts the character of objectivism in its methods and ideals is in line with the traditional view of science as a discipline that aims to uncover objective truths about the natural world. This view is based on the idea that scientific methods are designed to eliminate subjective biases and produce objective knowledge. However, we believe that important to note that the distinction between subjectivity and objectivism is not always clear-cut and that the practice of science can be influenced by various social, cultural, and historical factors and cannot be divorced entirely from them.

In the article "Scientific Pluralism and the Plurality of the Sciences: Comments on David Hull's "Science as a Process,"" John Dupré analyses David Hull's views on scientific pluralism and the relationship between the sciences (5). Dupré argues that Hull's views on scientific pluralism are too narrow and

fail to fully account for the diversity and complexity of the scientific enterprise. Therefore, we can conclude that no single universal scientific method can be applied to all scientific disciplines, and it is essential to recognize and appreciate the diversity of scientific approaches and perspectives.

In the article "Science as a Market Process," author A. Walstad presents the idea that science operates as a market process in which exchanging ideas and scientific findings can be seen as a form of trade (6). This perspective views the scientific community as a marketplace of ideas in which scientists act as agents competing for resources and recognition. This idea of science as a market process challenges the traditional view of science as a strictly objective and linear process and instead highlights the role that competition, bargaining, and negotiation play in shaping scientific discovery and knowledge. Walstad argues that market forces, including the allocation of resources and the demand for certain types of scientific knowledge, influence progress and discoveries in science. The author suggests that science can be seen as a market process in which scientists compete for funding and recognition in the scientific community. In this view, the success of a scientific theory or research project is determined by its ability to attract funding, gain recognition, and generate further research opportunities. The author concludes that understanding the influence of market forces on science is essential for accurately evaluating scientific progress and ensuring that the best interests of society guide the pursuit of knowledge.

In our opinion, this concept deserves a more detailed study in the context of the marketing of science. In order to gain a deeper understanding of the relationship between science and the market, it would be valuable to conduct further research on the subject. This could include examining historical cases of how market forces have affected scientific progress and current examples of how funding, resources, and competition play a role in the scientific enterprise.

The article "Science as a Process" by J.A.W. Kirsch provides a review of David Hull's book, "An Evolutionary Account of the Social and Conceptual Development of Science" (7). In the article, Kirsch evaluates Hull's theory that science should be seen as a process that is shaped by both social and evolutionary factors. Kirsch's review highlights the strengths of Hull's argument, particularly his emphasis on the role of scientific communities in shaping the development of scientific ideas. However, Kirsch also criticises Hull's theory, distinguishing between genuine scientific progress and mere sociological change within a scientific community. In our opinion, the distinction between genuine scientific progress and mere sociological change within a scientific community is

a complex issue that requires a deep understanding of the scientific process and the criteria for scientific progress. One way to approach this distinction is to examine the criteria for scientific progress, such as empirical evidence, theoretical coherence, and explanatory power, and compare these criteria to the changes occurring within the scientific community. Additionally, examining the degree to which the changes are driven by internal or external factors, such as scientific discoveries or societal influences, can provide additional insight into the nature of the changes. Ultimately, the distinction between genuine scientific progress and mere sociological change is a complex and ongoing debate within the scientific community and requires ongoing evaluation and reflection.

The study "Factors that Predict Life Sciences Student Persistence in Undergraduate Research Experiences" by 8. Cooper KM, Gin LE, Akeeh B, Clark CE, Hunter JS, Roderick TB, et al. (2019) is a quantitative research that investigates the predictors of persistence in undergraduate research experiences in life sciences (8). The researchers collected data from a sample of undergraduate students in life sciences and analyzed it using regression analysis. The study's results showed that several factors, such as prior research experience, academic self-efficacy, and supportive academic environment, significantly predict persistence in undergraduate research experiences. In conclusion, we can point out the necessity to conduct research to investigate the direct relationship between student persistence and the development of science.

The study "Give Science and Peace a Chance: Speeches by Nobel Laureates in the Sciences, 1901-2018" by Bucchi, Loner, and Fattorini (2019) is qualitative research that aims to understand the relationship between science and peace by analyzing the speeches of Nobel laureates in the sciences from 1901 to 2018 (9). The researchers used content analysis to categorize the speeches into different themes and analyzed them to determine the extent to which Nobel laureates have discussed the relationship between science and peace.

The study's findings suggest that Nobel laureates have often referred to the role of science in promoting peace and reducing conflicts but also recognized the potential for science to be used for destructive purposes. The researchers found that the themes related to peace and science have evolved, reflecting changes in the global political landscape and the increasing awareness of the impact of science on society. This study provides valuable insights into the historical relationship between science and peace and highlights the importance of considering scientific advancements' ethical and social implications. The results also suggest that it is essential to continue promoting discussions and

reflections on the role of science in promoting peace and ensuring that it is used for the betterment of humanity.
Therefore, considering this study, we believe that in a scientific approach to life, the discussion is an essential element in solving any issues and conflicts, but, considering the unreadiness and inability of most people to scientific thinking and the inability to discuss, it remains unattainable for the all-encompassing public for several years ahead.

Holme (2022) provides an overview of complexity science, an interdisciplinary field that studies complex systems and the phenomena arising from their interactions (10). He argues that complexity science is crucial because it offers new insights into the functioning of complex systems, including those found in natural and social systems.

Thus, we believe integrating complexity science and abstract thinking can provide valuable insights into various fields and phenomena. Complexity science seeks to understand and explain the behaviour of complex systems, which can range from biological organisms to social systems to the universe as a whole. Complexity science can provide new perspectives on a range of philosophical and theoretical questions when combined with abstract thinking. For example, one can use complexity science to analyze and understand the evolution of ideas and beliefs within a given culture or to explain the emergence of new social norms and movements. Additionally, complexity science can help to shed light on the underlying mechanisms driving the development of individual beliefs and ideologies and how these are transmitted and modified through social interactions.

The article "The Diversity-Innovation Paradox in Science" by Bas Hofstra, Vivek V. Kulkarni, Sebastian Munoz-Najar Galvez and others, published in the Proceedings of the National Academy of Sciences of the United States of America, explores the relationship between diversity and innovation in the scientific community (11). The authors use data from various sources to examine the impact of diversity on science innovation in terms of demographic diversity (such as gender and ethnicity) and disciplinary diversity (the diversity of scientific disciplines represented in a team). The study results show that while demographic diversity has a positive effect on innovation in science, disciplinary diversity has a negative effect. The authors explain this phenomenon as the "diversity-innovation paradox", which highlights the tension between the benefits and challenges of promoting diversity in science. They suggest that this paradox can be overcome by creating more inclusive scientific communities

that promote interdisciplinary collaborations and value diverse perspectives. In conclusion, this article sheds light on the complex relationship between diversity and innovation in science and provides essential insights into the potential benefits and challenges of promoting diversity in scientific research. The authors call for further research to explore the diversity-innovation paradox and develop strategies to promote a more inclusive and innovative scientific community.

The article "Scientific Truth and the Scientific Spirit" by A. B. Macallum published in 1916 in the journal of science, provides a comprehensive exploration of the concept of scientific truth and the scientific spirit (12). The A. B. Macallum argues that scientific truth should be distinguished from absolute truth and should be considered an approximation to the real world, subject to revision in light of new evidence and changing circumstances. Macallum also emphasizes the importance of the scientific spirit, which he defines as the pursuit of knowledge for its own sake rather than for practical applications. The author analyses the scientific method and the role of scepticism in science. He argues that the scientific spirit requires a critical and open-minded approach to evidence and that the pursuit of scientific truth requires constant testing and revision.

The article "The Nature of Scientific Enquiry" by M. D. Herron provides a comprehensive examination of the scientific process and its underlying principles (13). Herron argues that scientific enquiry is a dynamic, iterative process involving the generation of hypotheses, collection of data through experimentation or observation, and testing and revising these hypotheses based on the available evidence. He emphasizes the importance of empirical evidence and critical thinking in scientific enquiry and the role of replication and peer review in ensuring the validity of scientific claims. Therefore, we can conclude the importance of the impartiality of science during the scientific process and the inadmissibility of influence on scientific research.

The article "The Role of Independent Science in Innovation" by Rudra Prasad Ghimire discusses the importance of independent scientific research for promoting innovation in various fields (14). Ghimire believes that independent scientific research is critical for fostering innovation because it permits researchers to follow their interests without economic pressures. The author also mentions that independent study can lead to discoveries in domains that may not be profitable but are nonetheless crucial for knowledge growth. Ghimire also believes that governments and other funding organizations should

increase their support for independent scientific research to continue playing an essential role in supporting innovation.

Thus, we will examine the essential scientific opinions from our point of view and highlight some crucial arguments.

It should be noted that science has long been recognized as the driving force behind human development and progress, but it can also be used to promote peace and resolve conflicts. However, to ensure that science is used to achieve these noble goals, we need to foster ongoing debate about the role of science in promoting peace and human development. In this case, we need to identify the challenges and opportunities associated with this role and highlight how science can contribute to peace and human development.

One of the significant challenges associated with the role of science in promoting peace is the politicization of science. In many cases, science is used to support political agendas rather than as a neutral platform for dialogue and knowledge sharing. This problem can be exacerbated by the lack of resources and funding for scientific research, which can make scientists vulnerable to the influence of powerful interest groups. Another challenge is the complexity of the issues surrounding peace and human development. Achieving sustainable peace and human development requires a multifaceted approach that involves social, economic, and political factors. Science can contribute to this effort, but it cannot solve all the problems independently. Therefore, a comprehensive and interdisciplinary approach is necessary to achieve long-term results.

Let us analyze the involvement of people in the scientific dialogue from a marketing point of view and strategies. We will apply an interdisciplinary approach.

In our opinion, encouraging people to engage in productive dialogue when they are not willing to listen or speak can be challenging. However, it is not an insurmountable challenge, and there are strategies that researchers can employ to facilitate productive dialogue and encourage participation.

We can claim that one crucial strategy is to create a safe and respectful space for dialogue. This involves setting ground rules for the discussion that emphasizes the importance of listening to others, respecting diverse perspectives, and refraining from personal attacks or disrespectful behavior. When people feel they are in a safe and respectful environment, they are more likely to engage in productive dialogue.

We can suggest another essential marketing strategy is to appeal to people's values and emotions. People who feel passionate about an issue are more

likely to engage in dialogue and share their perspectives. Researchers can appeal to people's values and emotions by framing the discussion to emphasize the importance of the issue at hand and the potential impact on people's lives. It is common knowledge that another opportunity is the potential of science to promote education and knowledge sharing. By disseminating scientific knowledge and promoting critical thinking, science can help build a more informed and engaged society that is better equipped to address the world's challenges. Moreover, we believe that science education can promote a culture of peace and cooperation where individuals are empowered to contribute to the common good, but who and how should determine what the common good is.

CONCLUSIONS

We have analyzed the scientific studies and publications on the nature of scientific inquiry. The main conclusion we have drawn is that the subjective experience of scientists forms scientific theories and that the distinction between subjectivity and objectivism is not always clear-cut. The practice of science can be influenced by various social, cultural, and historical factors and is not entirely divorced from them. This implies that no universal scientific method can be applied to all scientific disciplines, and it is essential to recognize and appreciate the diversity of scientific approaches and perspectives.

We note that the historical aspect has a significant influence on scientific discoveries. Because most scientists act depending on the period they live in and consider the impact of historical factors, such as sociocultural factors, the church and others. Understanding the historical context of scientific discoveries can help us better understand their relevance and impact and how wider cultural and societal forces influence scientific research.

Additionally, we have noted the importance of researching the relationship between student persistence and the development of science. We believe the discussion is critical in scientific inquiry and solving conflicts. However, the unreadiness and inability of most people to engage in scientific thinking and the inability to discuss remain a challenge for the general public for several years ahead.

Furthermore, we believe that integrating complexity science and abstract thinking can provide valuable insights into various fields and phenomena. However, the pursuit of scientific truth is often hindered by political propaganda, ideologies, or religious lies. Hence, we must be critical thinkers and

overcome these obstacles to continue progressing in understanding the world around us.

In conclusion, science is a light in a world of darkness, illuminating the path to knowledge and understanding. Pursuing scientific truth requires us to be critical and appreciate the diversity of scientific approaches and perspectives.

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