

Delving into the Principles and Application of Positivism in Research: A Guide for Scholars

Fodouop Kouam Arthur William (Ph.D., corresponding author)

willyfodouop@163.com

<https://orcid.org/0009-0009-3030-1094>

Sanya University, Saxo Fintech Business School, Sanya, China

+86-185-136-757-41

Abstract

This comprehensive guide delves into the principles and application of positivism in research, offering practical tips and examples for scholars to conduct empirical studies within this paradigm effectively. By synthesizing existing literature and addressing the complexities of positivism, this study fills a gap in the research by providing a nuanced and detailed resource for researchers seeking to enhance the rigor and reliability of their research findings. The guide outlines the critical principles of positivism and discusses its strengths and limitations, ultimately contributing to advancing knowledge and understanding in various fields. Through thoroughly examining positivism's evolving nature and considering alternative paradigms, this study offers valuable insights for researchers aiming to conduct methodologically sound and impactful empirical studies.

Keywords: Empiricism; epistemology; quantitative research; positivism; research methodology; scientific inquiry

1. Introduction

The evolution of positivism in social science research has been debated and critiqued. Delanty (1997) traces the rise and fall of positivism, arguing for a synthesis of radical constructivism and critical realism in contemporary social science. Bailey and Eastman (1994) highlight the link between early positivist thinkers and the idea of human betterment and the unfulfilled promise of social science. Reed (2010) contextualizes the production of social-scientific knowledge, proposing a reconstitution of the relationship between the investigator's and the subject's social worlds as a basis for accurate knowledge.

Research paradigms sometimes need clarification. It is crucial to note that positivism focuses on objective truth and empirical evidence. On the other hand, interpretivism emphasizes understanding subjective meanings and interpretations, while constructivism sees reality as a social construction and values multiple perspectives (William, 2024). According to the principles of positivism, research should be based on empirical observation and measurable phenomena to develop objective and value-free knowledge. Positivism emphasizes the importance of gathering data systematically and ensuring that research findings are verifiable and replicable.

Anterior studies have explored the application of positivism in various research settings, ranging from experimental psychology to social surveys. This approach has historically dominated the philosophy of science and is commonly used in quantitative research in nursing (Yang et al., 2008). While positivism has successfully generated reliable and generalizable knowledge, some scholars have criticized its emphasis on objectivity and its failure to consider the social context in which research is conducted. As Howe (2009) suggests, positivism has been criticized for its dogmatic nature, particularly in education research. Additionally, positivist research is often rebuked for its reliance on structured surveys and questionnaires, which may limit the depth of participant insights.

Despite the widespread use of positivism in research, scholars often need help understanding and applying its principles effectively. Susman and Evered (1978) and Lincoln and Guba (2017) critique positivist science's limitations, with Susman and Evered suggesting that action research may be a more suitable alternative. Taylor and Medina (2013, 2011) further complicate the issue by highlighting the shift from positivism to a multi-paradigmatic and pluralistic approach in educational research, indicating a broader trend away from strict

adherence to positivist principles. These critiques and shifts in research paradigms underscore positivism's complexity and evolving nature in research.

The primary research question guiding this study is: **How can scholars effectively apply the principles of positivism in their empirical research projects?**

The specific objectives of this guide are to:

Provide an overview of the critical tenets of positivism and their implications for research design and data collection.

Offer practical tips and examples for scholars to apply positivist principles in their research projects.

Discuss the strengths and limitations of positivism as a research paradigm and how these may impact research outcomes.

This study is significant as it fills a gap in the literature by providing a comprehensive guide to the principles and application of positivism in research for researchers. By offering practical advice and examples, this guide aims to empower researchers to conduct rigorous and methodologically sound empirical studies that adhere to the principles of positivism.

The remainder of this paper is organized as follows. Section two provides an overview of the critical principles of positivism and their implications for research design. Section three offers practical tips and examples for applying positivist principles in research projects. Section four discusses the strengths and limitations of positivism as a research paradigm. The last section concludes the paper with a summary of key takeaways and suggestions for further research.

2. Overview of the critical principles of positivism and their implications for research design

Positivism, a research paradigm, is characterized by its focus on objectivity, hypothesis testing, and quantitative methods (Park et al., 2019). It is rooted in foundationalism and empiricism, valuing the verification of hypotheses (Ryan & Sfar-Gandoura, 2018). Habib (2020) argues that positivism plays a widely used paradigm in research, with its principles guiding the selection of appropriate methodologies. This section provides an overview of the critical tenets of positivism and their implications for research design, highlighting how researchers can apply these principles in their empirical studies.

2.1. Emphasis on objectivity

One of the central tenets of positivism is the importance of objectivity in research. Positivist researchers strive to eliminate bias and subjective interpretation from their study, focusing instead on gathering data that can be objectively observed and measured. To achieve this, researchers often use quantitative methods such as surveys, experiments, and statistical analysis to collect and analyze data.

When designing a study from a positivist perspective, researchers should prioritize using objective and measurable data collection methods. It may involve developing structured surveys, conducting controlled experiments, or analyzing existing datasets to generate numerical data that can be statistically analyzed.

2.2. Empirical verification

Positivism emphasizes the importance of empirical verification in generating knowledge. Researchers must base their findings on observable facts and evidence rather than subjective beliefs or interpretations. This focus on empirical verification ensures that research findings are reliable, replicable, and generalizable across different contexts.

In designing a positivist research study, scholars should ensure that their research questions are testable and that their hypotheses can be empirically verified through data collection and analysis. It may involve specifying clear variables, operationalizing concepts, and using rigorous research methods to collect and analyze data that support or refute the research hypotheses.

2.3. Nomothetic explanation

Positivism favors a nomothetic approach to research, seeking to identify general laws or patterns that explain phenomena across populations. By focusing on generalizable findings, positivist researchers aim to develop theories and hypotheses that can be applied beyond the specific context of a single study.

When conducting positivist research, researchers should strive to collect data that can be used to develop generalizable theories or laws. It may involve sampling techniques that ensure a representative sample of the population, using statistical analysis to identify patterns and trends in the data, and drawing conclusions that have broader applicability beyond the specific study.

2.4. Causal relationships

Positivism strongly emphasizes identifying causal relationships between variables, seeking to determine the factors that influence or cause particular outcomes. By establishing causal relationships, scholars can develop theories that explain the underlying mechanisms driving observed phenomena.

In designing a research study from a positivist perspective, researchers should prioritize identifying causal relationships between variables. It may involve using experimental designs to manipulate variables and establish cause-and-effect relationships, conducting longitudinal studies to assess changes, or using statistical analysis to identify correlations and associations between variables.

The critical principles of positivism emphasize objectivity, empirical verification, nomothetic explanation, and causal relationships in research design. By prioritizing these principles, researchers can ensure that their studies are rigorous, reliable, and capable of generating generalizable knowledge. Scholars must adhere to these principles when designing and conducting empirical studies within the positivist paradigm. The following section offers workable tips and examples regarding positivism's application in research projects.

3. Practical tips and examples for applying positivist principles in research projects

While understanding the fundamental principles of positivism is essential for conducting empirical research, putting these principles into practice can be challenging for scholars. Shanks (2002) suggests developing a clear understanding of key concepts and assumptions, carefully defining the boundary of the theory, and using hypotheses in empirical testing. Park et al. (2019) emphasize the importance of identifying explanatory associations or causal relationships through quantitative approaches and the need for generalizable inferences, replication of findings, and controlled experimentation. Moreover, Paré (2004) provides a step-by-step methodology for developing theories and conducting positivist case studies in information systems, focusing on revealing new perspectives and empirical insights. This section provides practical tips and examples for applying positivist principles in research projects to help researchers navigate the complexities of empirical research and generate robust and reliable findings.

3.1. Develop clear and testable research questions

In positivist research, it is essential to develop research questions that are clear, specific, and testable. Avoid vague or overly broad questions that are difficult to operationalize and measure. Example: Instead of asking, "How do people feel about climate change?" a more positivist research question could be, "What is the relationship between individuals' beliefs about climate change and their willingness to adopt sustainable behaviors?"

3.2. Use structured data collection methods

Positivist research relies on structured data collection methods, such as surveys, experiments, and observations, to gather objective and measurable data. Scholars should ensure that their data collection instruments are standardized and reliable. For instance, scholars can design a survey questionnaire with closed-ended questions and Likert scales to assess participants' attitudes toward social media usage.

3.3. Employ statistical analysis techniques

Positivist research often involves statistical analysis to analyze data and test hypotheses. Researchers must familiarize themselves with basic statistical techniques, such as correlations, t-tests, and regression analysis, to

draw meaningful conclusions from their data. For example, researchers can conduct a regression analysis to examine the relationship between students' study habits and academic performance.

3.4. Ensure replicability and generalizability

Positivist research aims to generate replicable and generalizable findings across different contexts. Scholars should ensure that their study design and methodology are transparent and documented to facilitate replication by other researchers. Academic papers should describe the research report's sampling strategy, data collection procedures, and analysis techniques to enable others to replicate the study.

3.5. Consider alternative explanations

In positivist research, it is essential to consider alternative explanations for findings and potential confounding variables that may influence the relationship between variables. In their study design, scholars should consider addressing internal and external validity threats. For instance, a sensitivity analysis can be conducted to assess the robustness of the results relative to different assumptions or model specifications.

3.6. Seek peer review and feedback

Scholars can present their research findings at conferences, workshops, or seminars to solicit feedback and refine their research approach. For example, researchers can submit their research paper to a peer-reviewed journal for feedback from reviewers before publication.

Applying positivist principles in research projects involves developing clear and testable research questions, using structured data collection methods, employing statistical analysis techniques, ensuring replicability and generalizability, considering alternative explanations, and seeking peer review and feedback. By following these practical tips and examples, researchers can enhance the rigor and reliability of their empirical studies within the positivist paradigm, ultimately leading to robust and insightful findings that contribute to advancing knowledge in their respective fields. The subsequent section discusses the strengths and limitations of positivism.

4. Strengths and limitations of positivism as a research paradigm

Positivism is a widely used research paradigm in the social sciences and natural sciences, valued for its emphasis on empirical observation, objectivity, and the pursuit of generalizable knowledge. However, like any research paradigm, positivism has its strengths and limitations. This section explores positivism's key strengths and limitations as a research paradigm.

4.1. Strengths of positivism

Park et al. (2019) highlight its strengths, such as its focus on identifying causal relationships and using quantitative approaches. Schrag (1992) defends positivist research paradigms, suggesting that even critics are logically committed to propositions that can be tested using positivist methods. Panhwar et al. (2017) also support post-positivism, a related paradigm, as a practical approach in social and educational research, emphasizing its pluralistic and critical multiplicity aspects. Additionally, positivism provides a solid foundation for quantitative research in pedagogy (Maksimović & Evtimov, 2023).

- Objectivity

Positivism prioritizes objectivity in research, aiming to minimize bias and subjective interpretation. Positivist researchers can generate reliable and replicable findings by emphasizing empirical observation and measurement.

- Rigor and methodological soundness

Positivism promotes using rigorous research methods, such as experiments, surveys, and statistical analysis, to test hypotheses and draw valid conclusions. This focus on methodological soundness increases the credibility of research findings.

- Generalizability

Positivist research seeks to identify general laws or patterns that can be applied beyond the specific context of a single study. Positivist researchers can develop theories and hypotheses with broader applicability by focusing on generalizability.

- Causal Inference

Positivism emphasizes identifying causal relationships between variables, allowing researchers to understand the underlying mechanisms driving observed phenomena. This focus on causal inference enables researchers to develop theories explaining specific outcomes.

- Efficiency and precision

Positivist research often involves using quantitative data collection methods and statistical analysis techniques, which can lead to precise and quantifiable results. This efficiency allows researchers to draw clear and objective conclusions from their data.

Positivism offers several strengths in research, including its emphasis on objectivity, rigor, methodological soundness, generalizability, causal inference, and efficiency in generating precise results. These strengths contribute to the credibility and reliability of research findings (William, 2024) and provide a solid foundation for quantitative research in various fields. However, it is essential to acknowledge the limitations of positivism, which will be discussed in the next section.

4.2. Limitations of positivism

Positivism has been critiqued for its limitations in generating knowledge for practical problem-solving (Susman & Evered, 1978). Its realist ontological and objectivist epistemological assumptions have been linked to ethical issues such as deceptive research and objectification of human participants (Lincoln & Guba, 2017). Furthermore, Maksimović and Evtimov (2023) and Masuku (2023) discuss the challenges of applying positivism in pedagogy and library and information science, respectively. They argue that positivism's focus on objectivity and causality may not be suitable for these fields, which involve complex human interactions and subjective experiences. Izzalqurny and Nabila (2021) further challenge the positivist paradigm in accounting research, advocating for using non-positivist paradigms such as interpretive, critical, and postmodernist. These paradigms, he argues, can fulfill scientific criteria and address the limitations of positivism.

- Reductionism

Positivism prioritizes quantitative data and empirical observation, potentially overlooking the nuances and complexities of human behavior and social phenomena. This reductionist approach may fail to capture the full richness of qualitative data and individual experiences.

- Lack of contextual understanding

Positivist research may prioritize generalizability at the expense of understanding the specific context in which phenomena occur. This lack of contextual understanding can limit the applicability of research findings to real-world settings.

- Ethical considerations

Positivist research may face ethical challenges when seeking to control and manipulate variables in experimental designs, potentially infringing on participants' autonomy and well-being. Researchers must consider ethical implications when designing and conducting positivist studies.

- Limited exploration of subjective phenomena

Positivism's emphasis on objectivity and empirical observation may restrict exploring subjective experiences, emotions, and beliefs that cannot be easily measured or quantified. This limitation may impede researchers' understanding of the human experience.

- Overemphasis on quantitative data

Positivism prioritizes quantitative data over qualitative data, which may limit researchers' ability to gain in-depth insights into complex social phenomena. Researchers should consider integrating qualitative methods to complement quantitative findings.

While positivism offers strengths in generating rigorous and reliable research findings, it also faces several limitations that researchers must carefully consider. The critique of positivism includes issues related to reductionism, lack of contextual understanding, ethical considerations, limited exploration of subjective phenomena, and overemphasis on quantitative data. Acknowledging and addressing these limitations is crucial for researchers to conduct comprehensive and impactful research that considers the complexities of human

behavior and social phenomena. By recognizing the drawbacks of positivism, researchers can adopt a more nuanced and inclusive approach to inquiry that integrates quantitative and qualitative methods to enhance the depth and breadth of their findings. Balancing the strengths and limitations of positivism allows for a more nuanced and holistic approach to empirical inquiry.

5. Conclusion

This guide provides scholars with a comprehensive overview of the principles and application of positivism in research, offering valuable insights into effectively conducting empirical studies within this paradigm. Researchers can enhance the rigor and reliability of their research findings by emphasizing objectivity, empirical verification, nomothetic explanation, and causal relationships. Practical tips and examples have been provided to help scholars navigate the complexities of positivist research, ensuring methodological soundness and robust conclusions.

While positivism offers strengths in generating generalizable and reliable knowledge, it is essential to acknowledge its limitations, including reductionism, lack of contextual understanding, ethical considerations, limited exploration of subjective phenomena, and overemphasis on quantitative data. Recognizing these limitations can guide researchers in adopting a more balanced and inclusive approach to research that integrates quantitative and qualitative methods.

This paper contributes significantly to the existing literature by providing a comprehensive guide to the principles and application of positivism in research for scholars. While previous studies have explored the concept of positivism and its implications, this guide offers practical tips and examples for researchers to apply positivist principles in their empirical research projects effectively. By synthesizing and expanding upon existing scholarship in this area, this study fills a gap in the literature by offering a practical and detailed resource for researchers seeking to conduct rigorous and methodologically sound empirical studies within the positivist paradigm.

Moreover, this guide addresses the complexity and evolving nature of positivism in research, considering its strengths and limitations. By discussing the critical principles of positivism, providing practical guidance for application, and highlighting the strengths and limitations of this research paradigm, this study offers a nuanced and comprehensive perspective on positivism in research. Researchers can benefit from the insights and recommendations presented in this guide to enhance the quality and rigor of their empirical studies, ultimately contributing to advancing knowledge and understanding in their respective fields.

Future research should continue to explore the evolving nature of positivism in research, considering alternative paradigms such as post-positivism, interpretivism, and critical realism. Additionally, further studies could investigate the application of positivism in various disciplines beyond the social and natural sciences, addressing the unique challenges and opportunities present in different fields. By critically examining the strengths and limitations of positivism and striving for a more nuanced and holistic approach to research, scholars can contribute to advancing knowledge and understanding in their respective fields.

Acknowledgment

The author thanks all contributions to the redaction of this paper.

Funding

This research received no external funding.

Conflicts of interest

The author declares no conflicts of interest.

References

- Bailey, J.R., & Eastman, W. (1994). Positivism and the Promise of the Social Sciences. *Theory & Psychology*, 4, 505 - 524.
- Delanty, G. (1997). *Social science: Beyond constructivism and realism*. U of Minnesota Press.
- Habib, H. (2020). Positivism and post-positivistic approaches to research. *UGC Care Journal*, 31(17), 1000-1007.
- Howe, K. R. (2009). Positivist dogmas, rhetoric, and the education science question. *Educational Researcher*, 38(6), 428-440.
- Izzalqurny, T.R., & Nabila, F. (2021). Apakah Paradigma Nonpositivsm (Interpretif, Kritis dan Posmodernis) dalam Akuntansi "Ilmiah"? *MAKSIMUM*.
- Lincoln, Y.S., & Guba, E.G. (2017). Ethics: The Failure of Positivist Science. *The Review of Higher Education*, 12, 221 - 240.

- Maksimović, J.Ž., & Evtimov, J. (2023). Positivism and post-positivism as the basis of quantitative research in pedagogy. *Research in Pedagogy*.
- Masuku, M. (2023). Library and information science and the positivist paradigm: Some critical reflections. *Journal of Librarianship and Information Science*.
- Panhwar, A. H., Ansari, S., & Shah, A. A. (2017). Post-positivism: An effective paradigm for social and educational research. *International Research Journal of Arts and Humanities*, 45(45), 253-259.
- Paré, G. (2004). Investigating information systems with positivist case research. *Communications of the association for information systems*, 13(1), 18.
- Park, Y.S., Konge, L., & Artino, A.R. (2019). The Positivism Paradigm of Research. *Academic Medicine*, 95, 690 - 694.
- Reed, I.A. (2010). Epistemology Contextualized: Social-Scientific Knowledge in a Postpositivist Era*. *Sociological Theory*, 28, 20 - 39.
- Ryan, G.S., & Sfar-Gandoura, H. (2018). Introduction to positivism, interpretivism and critical theory. *Nurse researcher*, 25 4, 41-49.
- Schrag, F. (1992). In Defense of Positivist Research Paradigms. *Educational Researcher*, 21, 5 - 8.
- Shanks, G.G. (2002). Guidelines for Conducting Positivist Case Study Research in Information Systems. *Australas. J. Inf. Syst.*, 10.
- Susman, G.I., & Evered, R.D. (1978). An Assessment of the Scientific Merits of Action Research. *Administrative Science Quarterly*, 23, 582-603.
- Taylor, P. C., & Medina, M. (2011). Educational research paradigms: From positivism to pluralism. *College research journal*, 1(1), 1-16.
- Taylor, P.C., & Medina, M.N. (2013). Educational research paradigms: From positivism to multiparadigmatic.
- William, F.K.A. (2024). Interpretivism or Constructivism: Navigating Research Paradigms in Social Science Research. *International Journal of Research Publications*, 143(1).
- William, F.K.A. (2024). Mastering Validity and Reliability in Academic Research: Meaning and Significance. *International Journal of Research Publications*, 144(1), 287-292.
- Yang, C., Lee, L., & Tzeng, W. (2008). [The relationship between qualitative research and positivism]. *Hu li za zhi The journal of nursing*, 55 5, 64-8.