

# A Guide for Positivist Research Paradigm: From Philosophy to Methodology

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## ABSTRACT

Asserting that reality is objective, observable, and governed by universal laws through empirical investigation and logical reasoning, positivism continues to serve as a foundation in scientific inquiry. This paper provides a thorough examination of the positivist research paradigm, tracing its philosophical underpinnings and methodological implications. The epistemological foundation of positivism rests on objectivism, which posits that knowledge is independent of individual perceptions and can be verified through empirical evidence. Ontologically, positivism asserts a realist perspective, asserting a singular reality that exists external to human cognition. Axiologically, positivism emphasises value-free research to ensure objectivity and replicability of findings. This paper explores these philosophical beliefs and their application in research design, data collection techniques such as surveys and experiments, and data analysis methods, including statistical tools like SPSS and SmartPLS. By interpreting these aspects, this paper serves as a comprehensive guide for researchers adopting a positivist research paradigm, offering insights into its strengths, limitations, and ongoing relevance in present scientific inquiry.

**Keywords:** Positivism, Objectivism, Naive Realism, Value-Free Research, Research Methodology



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## 1 INTRODUCTION

The positivist research paradigm stands as a hallmark of scientific inquiry, characterised by its adherence to empirical observation, logical deduction, and the quest for objective knowledge. Rooted in the Enlightenment ideals of reason and empirical evidence, positivism gained prominence in the 19th century through the works of Auguste Comte and continues to influence various disciplines, from the natural sciences to the social sciences (Comte, 1858). This paradigm posits that reality is stable and can be observed and described from an objective viewpoint, free from the influence of the researcher (Neuman, 2014).

The philosophy of positivism asserts that the only authentic knowledge is scientific knowledge, which emerges from the positive affirmation of theories through strict scientific method (Kerlinger & Lee, 2000). Auguste Comte, often regarded as the father of positivism, advocated for a systematic approach to the study of society, emphasizing the need for a scientific foundation for social research (Cohen, 1988). This scientific approach entails the use of quantitative methods, which allow for the measurement and analysis of data, leading to the discovery of general laws and principles that govern phenomena (Creswell & Creswell, 2017).

Positivism has significantly shaped the methodological approaches employed in contemporary research. It emphasizes the importance of objectivity, replicability, and the use of statistical techniques to test hypotheses (Bryman, 2016). Researchers operating within this paradigm typically employ structured methodologies such as experiments, surveys, and longitudinal studies, which facilitate the collection of quantifiable data. These methods are designed to produce reliable and valid results that can be generalized to larger populations (Trochim & Donnelly, 2008).

Moreover, the positivist paradigm underscores the importance of theory in guiding research. Theories provide a framework for understanding the relationships between variables and for making predictions about future occurrences (Sekaran & Bougie, 2016). This theoretical orientation aligns with the positivist belief in the possibility of cumulative knowledge, where scientific progress is achieved through the gradual accumulation of verified facts and principles (Field, 2018).

Despite its many contributions, positivism has also faced criticism. Critics argue that it overlooks the subjective dimensions of human experience and the complexities of social phenomena (Silverman, 2016). They contend that the emphasis on quantification and objectivity may lead to a reductionist understanding of reality, where important qualitative aspects are disregarded (Maxwell, 2013). Nonetheless, positivism remains a foundational paradigm in research, offering a rigorous and systematic approach to the study of both natural and social worlds (Denzin & Lincoln, 2018).

This paper aims to provide a comprehensive guide to the positivist research paradigm, exploring its philosophical foundations, methodological approaches, and applications in contemporary research. By delving into the core principles of positivism, we seek to elucidate its enduring relevance and its contributions to the advancement of scientific knowledge across various fields.

## **1.1 Philosophical Foundations: Epistemology**

Epistemologically, positivism subscribes to objectivism, asserting that knowledge exists independently of individual perceptions and can be apprehended through systematic observation and experimentation (Crotty, 1998). This perspective contrasts with subjectivist approaches that emphasize the role of subjective experiences and interpretations in shaping knowledge. According to positivist epistemology, reality is external and can be objectively measured and quantified. This approach is deeply rooted in the works of early positivists like Comte and later expanded by philosophers such as Karl Popper and the Vienna Circle, who argued for the demarcation of scientific knowledge based on empirical falsifiability (Popper, 2002).

## **1.2 Philosophical Foundations: Ontology**

Ontologically, positivism espouses a realist view, positing that there is an objective reality external to human consciousness (Guba & Lincoln, 1994). This ontological stance aligns with naive realism, which holds that the world is as it appears, directly accessible to observation and measurement. According to this perspective, reality exists independently of our perceptions, beliefs, and interpretations, and can be understood through systematic observation and empirical investigation (Crotty, 1998).

## **1.3 Philosophical Foundations: Axiology**

Axiologically, positivism advocates for value-free research, aiming to minimise the influence of researcher biases and values on the research process (Hammersley, 2008). This commitment to objectivity ensures that findings are independent of subjective perspectives, enhancing the reliability and replicability of research outcomes. Positivist researchers adhere to the principle of detachment, striving to eliminate personal biases that may skew the interpretation of data. By maintaining a clear separation between facts and values, positivists believe that research can yield universal truths that are applicable across different contexts (Neuman, 2014; Bryman, 2016).

## 2 LITERATURE REVIEW

This paper will delve into a detailed literature review to explore how positivism has been applied across various disciplines, examine specific methodological approaches and techniques employed in positivist research, discuss the implications and critiques of the positivist paradigm, and conclude with reflections on its enduring significance in contemporary research practices.

Positivism, as a research paradigm, has profoundly influenced the philosophy and methodology of scientific inquiry. This section provides an extensive review of the literature, examining key philosophical assumptions, research strategies, and empirical applications of positivism across different disciplines.

### 2.1 Epistemological Assumptions of Positivism

Positivism's epistemological stance of objectivism asserts that knowledge is objective, verifiable, and rooted in empirical evidence (Crotty, 1998). This perspective emphasizes the role of observation and experimentation in acquiring valid knowledge, aiming to uncover universal laws and causal relationships that govern phenomena. Objectivist epistemology, as embraced by positivists, entails that the researcher's values and biases can and should be kept separate from the research process to ensure the purity and neutrality of the findings (Phillips & Burbules, 2000).

This epistemological stance supports the use of rigorous methodologies to uncover universal laws and truths that are replicable and generalizable. The reliance on empirical evidence and logical reasoning forms the backbone of positivist inquiry, with a strong emphasis on the validation and reliability of data through repeatable experiments and observations (Bryman, 2016). In contrast to interpretivist paradigms, which focus on understanding the meaning and context of human behavior, positivism aims to explain and predict phenomena by identifying cause-and-effect relationships (Neuman, 2014). This predictive capability is a key strength of the positivist approach, enabling the development of theories that can be tested and refined over time.

By adhering to the principles of objectivism, positivist researchers strive to produce knowledge that is free from personal or cultural biases, thus contributing to the cumulative advancement of science (Creswell, 2017). The objectivist nature of positivist epistemology has profound implications for the types of questions posed, the methodologies employed, and the interpretation of results. It mandates a structured and systematic approach to inquiry, where hypotheses are formulated based on existing theories, and data is collected and analysed to either support or refute these hypotheses. This process is iterative, with findings contributing to the ongoing refinement and development of scientific knowledge (Trochim & Donnelly, 2008).

### 2.2 Ontological Assumptions of Positivism

Ontologically, positivism adopts a realist perspective, positing the existence of an external reality that exists independently of human perception (Guba & Lincoln, 1994). This realist ontology supports the idea that reality can be studied and understood through systematic observation and measurement, aligning with the principles of naive realism.

Positivist ontology is grounded in the belief that the natural and social worlds operate according to laws and mechanisms that are discoverable through scientific inquiry. This belief in an objective, knowable reality underpins the positivist commitment to the empirical verification of theories and the use of rigorous methodologies to uncover truths about the world (Blaikie, 2007). The realist ontology of positivism thus provides the philosophical foundation for its emphasis on measurement, quantification, and the search for causal relationships.

Realism, in the positivist sense, asserts that objects and phenomena have an existence and properties that are independent of human thought. This perspective contrasts with relativist ontologies, which argue that reality is socially constructed and contingent upon human experience and interpretation (Creswell & Poth, 2018). By adhering to a realist ontology, positivism maintains that scientific knowledge is not merely a reflection of subjective perspectives but a reflection of an objective reality that can be observed, described, and understood.

The ontological stance of positivism has profound implications for research practice. It underlines the importance of objectivity and the need for researchers to remain detached from the phenomena they study to avoid bias and ensure the validity of their findings (Lincoln & Guba, 1985). This commitment to objectivity and the belief in a discoverable reality drives the positivist emphasis on experimental and quasi-experimental designs, where control and manipulation of variables are crucial for testing hypotheses and establishing causality.

In summary, the realist ontology of positivism asserts that an objective reality exists independently of human perception and can be systematically studied through empirical methods. This ontological foundation supports the positivist commitment to scientific rigor, objectivity, and the search for universal laws that explain natural and social phenomena.

## **2.3 Axiological Position of Positivism**

Axiologically, positivism advocates for value-free research, asserting that researchers should strive to maintain objectivity by minimizing personal biases and subjective interpretations (Hammersley, 2008). This commitment to value neutrality aims to ensure the reliability and replicability of research findings, allowing for the formulation of general laws and theories.

The axiology of positivism also entails a rigorous methodological approach where objectivity is paramount. Researchers utilize standardized instruments and procedures to collect data, ensuring consistency and precision in measurement (Trochim & Donnelly, 2008). This methodological rigor is underpinned by the belief that the natural world, including social phenomena, operates according to immutable laws that can be discovered through empirical investigation. Thus, positivist research is characterized by the systematic testing of hypotheses through controlled and replicable experiments or observations (Creswell, 2017).

Additionally, the value-free ideal in positivism is reflected in the emphasis on statistical analysis, which allows for the quantification of relationships between variables without the interference of the researcher's subjective judgment (Field, 2018). Statistical techniques provide a means to objectively assess the validity of hypotheses and the generalizability of findings, contributing to the cumulative nature of scientific knowledge (Kerlinger & Lee, 2000).

Critics of positivism, however, argue that complete objectivity is an unattainable ideal. They suggest that all research is influenced to some extent by the values and perspectives of the researcher, whether consciously or unconsciously (Patton, 2015; Maxwell, 2013). Despite these criticisms, the axiological stance of positivism remains influential, guiding researchers in their pursuit of unbiased and replicable findings.

## **2.4 Methodological Approaches in Positivist Research**

Positivist research methodologies emphasize deductive reasoning and quantitative analysis. Deductive reasoning involves formulating hypotheses based on existing theories and empirical observations, followed by rigorous testing through systematic data collection and analysis (Bryman, 2016). This deductive approach allows researchers to make predictions based on theoretical frameworks and evaluate these predictions through empirical data (Saunders et al., 2009).

Quantitative methods play a pivotal role in positivist research for their ability to generate numerical data that can be statistically analysed to uncover patterns, relationships, and generalizable conclusions (Creswell & Creswell, 2017). Surveys, experiments, and statistical techniques such as regression analysis and structural equation modelling are commonly employed to analyse quantitative data, enabling researchers to draw statistically valid conclusions and generalize findings to larger populations.

The systematic application of these methodologies ensures that positivist research adheres to principles of objectivity, replicability, and the rigorous testing of hypotheses (Bryman, 2016). By employing standardized instruments and statistical procedures, positivist researchers aim to minimize biases and subjective interpretations, thereby enhancing the reliability and validity of their findings (Creswell & Creswell, 2017).

## **2.5 Research Strategies in Positivist Paradigm**

Research strategies within the positivist paradigm predominantly employ experimental designs and large-scale surveys to test hypotheses and gather empirical evidence (Campbell & Stanley, 2015). Experimental designs enable researchers to manipulate variables and control conditions rigorously, facilitating the establishment of cause-and-effect relationships (Cohen et. al., 2002). These designs are structured to minimize bias and confounding factors, thereby enhancing the reliability of findings.

In addition to experiments, surveys play a crucial role in positivist research strategies by systematically collecting data from representative samples of a population (Fowler, 2014). Surveys utilize standardized questionnaires or interviews to gather quantitative data, allowing researchers to generalize findings and draw statistical inferences about broader populations (Johnson & Christensen, 2019).

These methodological approaches underscore the positivist emphasis on objectivity, replicability, and the systematic testing of hypotheses through quantitative means (Bryman, 2016). By employing such rigorous strategies, positivist researchers aim to uncover general laws and principles that govern phenomena, contributing to the cumulative advancement of scientific knowledge (Creswell, 2017).

## **2.6 Application Across Disciplines**

Positivism has been applied across various disciplines, including psychology, sociology, economics, and the natural sciences, shaping research practices and methodologies in each field (Phillips & Burbules, 2000; Bryman, 2016). By emphasizing empirical verification and systematic observation, positivism has contributed to the development of scientific knowledge and the advancement of theoretical frameworks in diverse domains.

In psychology, positivism's emphasis on empirical evidence and objective measurement has influenced research methodologies such as experimental designs and quantitative analysis (Cohen et. al., 2002). This approach allows psychologists to test hypotheses rigorously and draw conclusions based on observable phenomena.

Similarly, in sociology, positivism has provided a methodological framework for studying social structures and behaviours through surveys, statistical analysis, and longitudinal studies (Creswell, 2017; Bryman, 2016). By applying positivist principles, sociologists aim to uncover general laws and patterns governing human interaction and societal dynamics.

In economics, positivism has guided the development of econometric models and statistical techniques for analysing economic data (Field, 2018). This approach enables economists to make predictions, formulate policies, and understand economic phenomena within a scientific framework.

In the natural sciences, positivism underpins the experimental method, where hypotheses are tested through controlled experiments and empirical observation (Kerlinger & Lee, 2000). This systematic approach has been fundamental to advancements in fields such as physics, chemistry, and biology, facilitating discoveries and innovations.

Across these disciplines, positivism's insistence on objectivity and systematic inquiry has played a crucial role in expanding the frontiers of knowledge. By integrating empirical evidence with theoretical frameworks, researchers have been able to address complex questions and contribute to the cumulative growth of scientific understanding.

## 2.7 Critiques of Positivism

Despite its widespread adoption, positivism has faced criticisms regarding its oversimplification of complex social phenomena and its neglect of qualitative dimensions (Lincoln & Guba, 2000). Critics argue that positivist methodologies may overlook contextual nuances, cultural differences, and subjective experiences that shape human behaviour and social interactions. Additionally, the emphasis on quantitative data may limit the exploration of meanings, interpretations, and subjective realities that are central to understanding human experiences.

Lincoln and Guba (2000) further assert that positivist approaches tend to prioritize objectivity and replicability at the expense of understanding the unique contexts in which social phenomena occur. This critique suggests that positivism's reliance on standardized methods and statistical analysis may not fully capture the richness and complexity of human behaviour and social interactions in their natural settings.

Moreover, qualitative researchers argue that human experiences are inherently subjective and cannot be fully understood through quantitative measures alone. Qualitative methods, such as ethnography, phenomenology, and narrative inquiry, offer alternative approaches that emphasize the exploration of meanings, perspectives, and lived experiences of individuals and communities (Denzin & Lincoln, 2018).

In addressing these critiques, researchers have increasingly recognized the complementarity of quantitative and qualitative approaches within mixed-methods research designs. By integrating both types of methods, researchers can achieve a more comprehensive understanding of complex social phenomena, acknowledging both the statistical regularities and the contextual nuances that shape human experiences (Creswell & Plano Clark, 2017).

Therefore, while positivism continues to provide a rigorous and systematic framework for scientific inquiry, its limitations in capturing the full breadth of human experience have prompted scholars to embrace a more pluralistic approach to research methodology, one that integrates diverse perspectives and methods to enrich our understanding of the social world.

## 2.8 Contemporary Perspectives and Integrations

Contemporary research practices often integrate positivist approaches with interpretivist or critical perspectives to enrich methodological pluralism (Guba & Lincoln, 1994). Mixed-methods research, for instance, combines quantitative and qualitative approaches to provide a more comprehensive understanding of research problems, incorporating both numerical data and in-depth insights into social contexts and subjective experiences (Creswell & Plano Clark, 2017).

This integration acknowledges the limitations of purely positivist or purely interpretivist approaches, recognizing the value of triangulation in research, where multiple methods converge to offer a more complete picture of complex phenomena (Johnson et al., 2007). By combining quantitative

rigor with qualitative depth, researchers can better address the multifaceted nature of research questions and enhance the validity and reliability of their findings (Tashakkori & Teddlie, 2010).

Moreover, the inclusion of critical perspectives alongside positivist methods encourages reflexivity and awareness of power dynamics within research contexts (Denzin & Lincoln, 2018). Critical theory, for example, challenges dominant paradigms and seeks to uncover underlying structures of power and inequality, complementing positivist approaches that focus on empirical validation and generalizability (Maxwell, 2013).

By embracing methodological pluralism, contemporary researchers not only expand the methodological toolkit available but also foster richer, more nuanced understandings of complex social phenomena. This approach not only contributes to theoretical development but also enhances the applicability of research findings to real-world contexts, thereby addressing practical and ethical considerations within research (Patton, 2015)..

### **3 METHOD**

The method section outlines the specific methodologies and techniques employed within the positivist research paradigm, focusing on data collection and analysis strategies that emphasise objectivity, replicability, and statistical rigour.

#### **3.1 Data Collection Techniques**

Positivist research relies heavily on structured data collection techniques to gather empirical evidence and test hypotheses. Common methods include:

##### **a) Surveys**

Surveys are widely used in positivist research to collect quantitative data from large samples of respondents using standardised questionnaires (Fowler, 2014). Surveys allow researchers to measure attitudes, behaviours, and perceptions across diverse populations, facilitating statistical analysis and generalisation of findings.

##### **b) Experiments**

Experimental designs are employed to establish causal relationships between variables by manipulating independent variables and observing their effects on dependent variables (Campbell & Stanley, 2015). Controlled experimentation enables researchers to test hypotheses under controlled conditions, providing empirical evidence to support or refute theoretical predictions.

These techniques enable positivist researchers to gather reliable and valid data, which is essential for testing hypotheses and deriving generalizable conclusions in scientific inquiry.

#### **3.2 Data Analysis Techniques**

Positivist research relies on rigorous data analysis techniques to interpret quantitative data and derive meaningful conclusions from empirical evidence. Fundamental to this approach are statistical analysis tools such as SPSS and AMOS, which enable researchers to conduct statistical tests, regression analyses, and structural equation modelling (SEM) to uncover relationships and patterns among variables (Pallant, 2020; Byrne, 2010; Field, 2018). These tools facilitate the formulation of hypotheses and theoretical frameworks by providing robust statistical validation.

Moreover, the Rasch model plays a pivotal role in positivist research by analysing categorical data and measuring latent traits in psychometric studies (Bond & Fox, 2013). This model ensures the

reliability and validity of measurements, offering a structured framework for assessing latent variable hierarchies and comparing individuals based on their latent trait scores.

In addition to these core tools, positivist researchers often utilize software like Stata for comprehensive statistical capabilities, R for its flexibility and extensive statistical methods, and Excel for basic statistical calculations and data management. Furthermore, specialized programs such as Mplus support advanced statistical modelling, NVivo facilitates qualitative data analysis, and SAS provides robust analytics and predictive modelling functionalities. Matlab, known for its numerical computing capabilities, also offers statistical tools through its Statistics and Machine Learning Toolbox, catering to complex data analysis needs in positivist research.

These tools collectively contribute to the rigorous and systematic approach of positivist research, ensuring that empirical findings are grounded in robust statistical validation and contributing to the advancement of knowledge across various disciplines.

## 4 DISCUSSION

The positivist research paradigm as shown in Fig.1 offers several strengths that underscore its enduring significance in scientific inquiry. By prioritizing empirical observation, logical reasoning, and systematic data collection, positivist research facilitates the generation of reliable, replicable, and generalizable knowledge (Phillips & Burbules, 2000). The use of quantitative methods allows researchers to quantify phenomena, test hypotheses, and establish causal relationships, thereby supporting evidence-based decision-making and policy formulation across various domains.

Despite its strengths, positivism has not been immune to criticism. One of the primary critiques is its reductionist approach, which tends to oversimplify complex social phenomena (Lincoln & Guba, 2000). Critics argue that positivist methodologies may overlook contextual factors and neglect subjective interpretations and meanings that are crucial for understanding human experiences. The emphasis on objectivity and value-free research may also limit the exploration of diverse perspectives and alternative paradigms that offer complementary insights into research problems.

In response to these critiques, contemporary research practices often integrate positivist approaches with interpretivist or critical perspectives to enrich methodological pluralism (Guba & Lincoln, 1994). Mixed-methods research, for example, combines quantitative and qualitative approaches to provide a comprehensive understanding of research problems. This approach integrates numerical data with in-depth insights into social contexts, meanings, and subjective experiences, thereby adopting a more holistic approach to inquiry (Creswell & Plano Clark, 2017).

Moreover, the integration of positivist and interpretivist paradigms acknowledges the strengths of each approach while mitigating their respective limitations. This methodological pluralism enables researchers to address research questions from multiple angles, fostering a deeper and more nuanced understanding of complex phenomena. It also encourages reflexivity and the consideration of researcher biases, promoting a more transparent and inclusive research process.

Looking forward, the future of positivist research lies in its continued adaptation and integration with emerging paradigms and methodologies. Embracing advancements in data analytics, computational methods, and interdisciplinary collaborations can further enhance the rigor and relevance of positivist research in addressing contemporary societal challenges. By embracing methodological diversity and reflexivity, positivist inquiry can continue to evolve as a robust framework for advancing scientific knowledge and informing evidence-based practices.



PHILOSOPHICAL ASSUMPTIONS			METHODOLOGY					
EPISTEMOLOGY	ONTOLOGY	AXIOLOGY	Research Approaches	Research Choices	Research Strategies	Time Horizon	Data collection techniques	Data analysis techniques
Objectivist	Naive Realism	Value free	Deductive	Quantitative	Experiments, Surveys	Cross-sectional	Questionnaire, Observation	SPSS, SmartPLS, AMOS, Rasch Model

Figure 1 Positivist philosophical assumptions and methodology

## 5 CONCLUSION

In conclusion, this paper has provided a comprehensive guide to the positivist research paradigm, elucidating its philosophical foundations, methodological approaches, and applications in contemporary research. Positivism's steadfast commitment to objectivity, empirical validation, and quantitative analysis has been instrumental in advancing scientific knowledge across various disciplines. By emphasizing systematic and rigorous methods, positivist research has enabled researchers to generate reliable, replicable, and generalizable findings that inform evidence-based decision-making and policy formulation.

Despite criticisms regarding its potential for oversimplification and its historical neglect of qualitative dimensions, positivism remains a valuable framework for conducting disciplined inquiry. Its structured approach to hypothesis testing and causal inference has proven indispensable in addressing pressing societal challenges and advancing knowledge in fields ranging from natural sciences to social sciences.

As we navigate the complexities of contemporary research landscapes, positivism stands as a robust foundation for scientific inquiry, continuously evolving to meet the demands of an ever-changing world. By harnessing the strengths of positivist methodologies while acknowledging and addressing their limitations, researchers can propel scientific knowledge forward, making meaningful contributions to both academic scholarship and practical applications.

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Irwan Mohamad Ali is the sole author of this paper.

## CONFLICT OF INTEREST

No conflict of interest declared for this paper.

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