

Positivism: Form of Empiricism and Authentic Knowledge

by Asst. Prof. Dr. Kasma Suwanarak

Abstract

This article discusses and explores the positivist paradigm in research in a nutshell. An effort is made to show how this scientific method that reveals facts about the world is derived. Why hypotheses serve as the starting point in investigating phenomena will be justified as well as validity and reliability in quantitative studies pointed out. Interestingly, types of data to be collected and the very nature of tests to be administered present important aspects of positivist research. Last but not least, the paper ends with a discussion of the weaknesses together with the strengths of positivism.

Introduction

To put it simply, positivism is strongly associated with Auguste Comte. Weirich (1999) points out that Comte held that knowledge of the world arises from observation. However, Cohen et al. (2001) observe that the definition of positivism has expanded as Scott and Usher (1999: 12) give the following definition:

Positivism is an epistemological position which affirms the facticity of the world. It argues that, since the only possible content of true statements is facts, it is scientific method that reveals facts about the world. Scientific method is the set of rules which guarantee accurate representation — a correspondence between what reality is and how it is represented in knowledge.

Where positivists apply their beliefs to social science, they implicitly make certain assumptions about the nature of reality and the nature of knowledge. They assume that social reality is independent of human minds and is governed by general laws and relationships. Knowledge of this social reality can be discovered and takes the form of objective truth. Philosophically, they often take a realist position, believing that the objects of thought have independent existence and are not dependent on a knower. Positivist researchers at large identify themselves as observers of social reality who can discover its rules through the application of scientific experimental procedures.

Researchers working in the positivist paradigm seek to find laws or generalisations, which explain observable human behaviour. This has ramifications for their research design. Thus, their research usually takes the form of experiments and work with quantitative data.

Hypotheses

One example of a classic experiment on the investigation of phenomena starts with the creation of a hypothesis. Cohen et al. (2001) cite Kerlinger who defines the hypothesis as a conjectural statement of the relations between two or more variables. The criteria for a good hypothesis are that it is a statement about the relationship between two or more variables and that it has clear implications for testing the relationship. There are also two auxiliary criteria: the hypothesis is compatible with current knowledge and that it is expressed as economically as possible.

Following the definition of a hypothesis, an experimental group of subjects or samples is chosen and the hypothesis is tested, using well-established statistical tests and conventions. The hypothesis is then accepted or rejected. If it is accepted, then it is considered generalisable. The process of proving or disproving hypotheses parallels the method used in the natural sciences. Popper (1979) states that the line of demarcation between a scientific and a non-scientific statement is the criterion of falsifiability. A scientific statement is falsifiable whereas a non-scientific statement is not. Within the positivist paradigm to the social sciences, this also holds. Two key concepts in this kind of research are validity and reliability.

Validity and Reliability

Validity concerns the issue of whether the experiment proves or disproves the hypothesis it sets out to test. For example, a researcher may set out to test whether Thai girls are more intelligent than Thai boys at age 15. To do this he or she may use a test incorporating maths questions and English language questions on a sample of boys and girls. The results of the test may show a significant difference between the results of the boys and the results of the girls, leading the researcher to conclude that Thai girls are more intelligent than Thai boys at age 15. However, research readers may criticise its validity, pointing out that intelligence cannot be equated narrowly with an ability to merely answer the mathematical problems and the English questions. The experiment does not prove what it set out to prove, even though the testing indicates a significant difference between the boys and girls under investigation. Nunan (1994: 15) splits validity into internal and external factors:

Internal validity refers to the interpretability of research. In experimental research, it is concerned with the question: Can any differences which are found actually be ascribed to the treatments under scrutiny? External validity refers to the extent to which the results can be generalised from samples to populations.

Reliability focuses on a slightly different area. It is a measure of the rigidity of the experimental method in the research. Can the experiment be repeated? Will a repetition of the method on the same data yield the same result? In the previous example, the experiment may have been reliable but not valid. However, if the experiment is considered to be unreliable it cannot be valid. Nunan (ibid.: 14) also divides reliability into two factors:

Internal reliability refers to the consistency of data collection, analysis and interpretation. External reliability refers to the extent to which independent researchers can reproduce a study and obtain results similar to those obtained in the original study.

Measurement Scales

The positivist paradigm uses quantitative data. It is important to consider the types of data that can be collected, as this has implications for the use of instruments of testing within the positivist paradigm. It is also important to note that research within the interpretive paradigm may include quantitative data although it is used in a different way. Peers (1996) points out four different scales: nominal, ordinal, interval, and ratio.

- 1.) In a nominal scale, observations are placed into categories. The categories are well-defined, mutually exclusive and complete. The data can be compiled in the form of frequency counts.
- 2.) An ordinal scale introduces the idea of order. Therefore, categories can be ranked. However, the intervals between scores are not equal.
- 3.) In an interval scale, there is labelling, ordering and equality of units of measurement. However, there is no zero point. Therefore, numbers cannot be multiplied or divided.
- 4.) A ratio scale has all the qualities of the interval scale. In addition, it has an absolute zero point.

Parametric and Non-Parametric Tests

According to Cohen et. al. (2001: 317), parametric tests *are designed to represent the wider population- e.g. of a country or age group. They make assumptions about the wider population and the characteristics of the wider population.* In using parametric tests, the researcher assumes that the distribution of scores in the population is normally distributed and that the scores are part of an interval scale. In contrast, non-parametric tests are not designed for generalisation. They are designed for specific populations. They can be used with ordinal scales.

Weaknesses and Strengths of the Positivist Paradigm

A number of criticisms have been made of the positivist paradigm. Some critics have pointed out that the paradigm uses methods which were established in natural sciences. Natural science deals with the material world which is "out there". The nature of social reality is different and there is no social world "out there" independent of human minds. Social reality is constructed by individuals and it involves complex nets of ideas, groups of people and their surroundings. Positivists are limited by their paradigm in at least two senses. They tend to focus on observable behaviour and their hypotheses involve relatively few variables.

Hammersley (1990) justifies that human beings are often innovative and capable of change. The experimental approach can only be used where behaviour has become routinised. It is therefore limited in its applications. Moreover, critics have attacked the positivist paradigm for its dehumanising effects. This is because human beings are treated as experimental objects and the researcher removes and isolates him or herself from the world he or she studies.

As for the strengths of the positivist paradigm, these lie within its claims. For a positivist, it is a way of establishing objective truth. Using inferential statistics, the results of testing small groups can be expanded to wider populations. With continued testing, a picture of human behaviour can be built and relationships between key factors in human behaviour established.

References

- Cohen, L., Manion, L. & Morrison, K. (2001). *Research Methods in Education*. London: Routledge Falmer.
- Hammersley, M. (1990). *The Dilemma of Qualitative Method Herbert Bloomer and the Chicago Tradition* London: Routledge.
- Nunan, D. (1994). *Research Methods in Language Learning*. Cambridge: Cambridge University Press.
- Peers, I. (1996). *Statistical Analysis for Education and Psychology Researchers*. London: Falmer Press.

- Popper, K. R. (1979). *Objective Knowledge, an Evolutionary Approach*. Oxford: Oxford University Press.
- Scott, D. & Usher, R. (1999). *Researching Education: Data, methods and theory in educational enquiry*. London: Continuum International.
- Weirich (1999). Positivism. In Audi, R. (Ed.) *The Cambridge Dictionary of Philosophy* (p.169). Cambridge: Cambridge University Press.

About the writer:

Asst. Prof. Dr. Kasma Suwanarak holds a doctoral degree in TESOL (Teaching English to Speakers of Other Languages) from the University of Exeter, UK. She obtained her Master's in Applied Linguistics from Kasetsart University, where she also completed her first degree in English Literature from the Faculty of Humanities. Presently, she is a lecturer in the Graduate School of Language and Communication, National Institute of Development and Administration (NIDA), Thailand.