Quantitative and qualitative research

Received and interpretivist views of science

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> *As far as the laws of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality.*
>
> Albert Einstein[1]

Some clinicians still believe that qualitative research is a "soft" science and of lesser value to clinical decision making, but this position is no longer tenable.[2-4] A quick search using the key word *qualitative* on the *Canadian Family Physician* website generated more than 100 qualitative research articles published in the past 3 years alone.

This paper provides an overview of the history of science to help readers appreciate the basic epistemological commonalities and differences between qualitative and quantitative approaches to research.

Age of Enlightenment

Copernicus (1473-1543), Galileo (1564-1642), Descartes (1596-1650), and Newton (1643-1727) were instrumental in carving the path to the Enlightenment (1700-1789)—an intellectual movement credited with introducing systematic inquiry and the scientific method. Auguste Comte (1798-1857), regarded as the founder of modern social science and credited with advancing a philosophic theory of positivism (ie, that factual knowledge can only be attained through observable experience), emphasized that the search for objective truth and knowledge must follow a nomothetic (ie, relating to the discovery of universal laws) and empirical (ie, based on experiment and observation) approach. Scientists of the Enlightenment era asserted that we must be free of the uncertainties of time, place, history, and culture in order to discover how the world works. This is referred to as the *received view* of science.[5]

Received view

Essentially, the received view posits that the world is made up of absolute truths existing independently of human consciousness. Knowledge is available for objective discovery within a causal and factual form. A reductionist approach to problem solving is used; theories are formulated and tested experimentally to verify or falsify different hypotheses; and numerical tests based on probabilistic theory are used to establish the levels of relationships between measurable variables.

Conversely, in *Critique of Pure Reason* (Immanuel Kant's 1781 thesis, which followed the work of Plato), Kant asserts that human reason also plays a key role in determining what constitutes knowledge. Unlike Comte, who favoured empirical experience as the most legitimate source of knowledge and who argued that pure knowledge begins and ends with sense experience free of subjective interpretation, Kant states that we not only experience the world as it presents itself to us, but we also interpret it.[4]

Interpretivist view

Karl Marx (1818-1883), Friedrich Nietzsche (1844-1900), Georg Simmel (1858-1918), Max Weber (1864-1920), Max Scheler (1874-1928), and Karl Mannheim (1893-1947), among others, produced sharp criticisms against the prevailing conception of science for understanding social interactions. Using Georg Wilhelm Friedrich Hegel's (1770-1831) idea that subjectivity is an inherent part of cognition, these social scientists rejected the claims that science, as a practice of discovery of a world independent of our senses, can in fact represent the *absolute* reality of social phenomena. The interpretivist view,[6] therefore, posits that knowledge is socially constructed and ephemeral.[7] In other words, it is influenced by history, culture, power differences in society, and politics.[8] In his cogent thesis *The Structure of Scientific Revolutions*, Thomas Kuhn argues that the interpretive nature is deeply and undeniably embedded in science.[9]

Conclusion

What is common among both experienced and budding researchers alike, whether from the positivist tradition or the interpretivist one, is a realization that an increasingly sophisticated representation of any particular phenomenon requires a form of systematic investigation. Those who employ qualitative methods usually seek in-depth perspectives on how society is thought to operate and the related historical, cultural, social, and political influences that affect how decisions are made. Those who use quantitative methods search for laws and principles that can help to predict how the world works. To understand the world better, some researchers use laboratories and clinics while others use cultural and social spaces. Yet all researchers regard their endeavours as a means to improve quality of life and well-being.

Whether researchers use qualitative or quantitative methods, they are building knowledge, which, in the end, is applied to our understanding of the world, allowing us to better care for our patients.

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