

Chapter 2

How the Philosophy of Science Affects the Conduct of Organisational and Management Research

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Researchers are constantly seeking new methods of research. Different research approaches are being used based on certain assumptions about reliability and validity. However, the approaches used in determining the reliability and validity can be challenged which is where philosophy of science needs to be underpinned. One can over-simplify the philosophy of science as two paradigms - the objectivist and the subjectivist. Objectivists mostly are quantitative, scientific, experimentalist and positivist; whereas subjectivists are qualitative, humanist and interpretivist (Burrell & Morgan, 1979). Not surprisingly, these camps criticize one another.

The problem is that (some of) the critics of modern science have gained greater traction because most of us merely ignore their arguments. It is important to either rebut or deal with the criticisms in some cogent way. Many of those practicing and studying science only have the vague understanding of the philosophical foundations of science, and even less awareness that these foundations were shaken to their core over the past few decades. Yet somehow, science has become increasingly influential in modern society. This relative success has as much to do with ignoring the challenges posed by postmodernism and social constructivism, as it does to ignorance of the arguments involved. This chapter offers both a brief primer of the epistemological history of science, and a utilitarian critique of the most recent challenges to the nature of scientific knowledge and method.

Significance of Philosophy of Science

Philosophy of science probes into questions that are challenging and not so easily answerable. By being philosophical, it seeks for justification of rationale or induction based on which scientific theories are made. Thus, it repeatedly challenges the claims to knowledge as well as justified beliefs (Sklar, 2010).

Clayton (1997) has also emphasised the importance of philosophy of science by stating that it is the reflection on the nature of scientific theories and practice. Science itself has been traditionally seen as adopting a deductive approach that is derived from natural light of reason. However, modern science follows the inductive approach that is based on methodological rule that are generalized by the scientists from empirical observations.

The issue with using inductive approach is that it is based on inferences that tell us more about the psychology than the real connections in the world. Thus, the purpose of the philosophy of science is to falsify risky hypotheses. The move from induction to falsification was set out by Karl Popper. Therefore, the existing scientific theories cannot be assumed true but it can be concluded that these theories could not be falsified despite all best efforts (Clayton, 1997). I will return later in the chapter to this important issue. Thomas Kuhn has also contributed to the field of philosophy of science through a descriptive approach by working on how science actually proceeds through discovery.

Philosophy of science also helps in inquiring conceptual and methodological analysis that was carried out by philosophers such as David Hume who investigated what scientists mean when they talk about causality. Philosophy of science also acts as a critic and deals with issues relating to science and the society such as the nature-nurture debate. Scientists may or may not have anything to do with what philosophers do and the philosophers can justify their practices because of the utility attached to it. Philosophers are not there to answer scientific questions, that is undoubtedly the work of a scientist which is being performed well, rather the work of philosophers are into posing questions and analysing concepts (Pigliucci, 2008). This relationship can also be viewed as the manufacturer of truth about nature, which makes philosophy of science an inquiry into the expanding problems that occur in managing the production of truth (Churchman, 1994).

Crane (2012) also studied the relationship between science and philosophy. His 'naturalism view' states that philosophy should learn as much as possible from scientific investigations as it learns from its own techniques. Another relationship is established by the empiricists who believe that with logical empiricism in the early 1990s, science began to play its role by imposing limits on what philosophy is capable of doing and not doing. However, philosophy asks for even more - it encourages critical analyse of fundamental assumptions, which is why philosophers are often seen to disagree with one and other. The disagreements could range from questioning about the truth of the given question to arguments about how a question needs to be stated and which may be left unanswered. Thus, the philosophy of science can be perceived as questioning the mere existence of knowledge on which scientific evidences are based (Crane, 2012).

On the other hand, Zammito (2011) also emphasized the history of epistemology and suggested that the gap between natural science and history has been significantly bridged by historicized epistemology of actual science. Thus, he actually wanted to drill down into the historical evolution of sciences (Zammito, 2011). Post-Kuhnians also believe that the historical practices of scientists need to be attended by the philosophy of science while the naturalists argue that there is a need for the scientific activities to be based on cognitive science results (Radder, 2012).

From Philosophy to Practice

In order to analyse how philosophy of science is manifested in the way organisational research is conducted; Kiduff, Mehra and Dunn (2011) have discussed different philosophical positions to deal with ontology and epistemology. Ontology deals with the basic question of meaning and reality while epistemology deals with knowledge. This can be observed from four different perspectives: the realist- pure research logic, the strong-paradigm organizing- exploitation logic, the foundationalist-induction logic, and the instrumentalist- problem-solving logic. The realists agree on the perspective that science provides true description about the real world and is based on factual evidence. An example of organisation that follows this view is Xerox PARC by Xerox Corporation that is a Research Center of Xerox- a high-tech company. The focus of the researchers from different fields was to pursue fundamental discoveries based on which technology like personal computer and laser printer were discovered by PARC researchers (Kiduff, Mehra & Dunn, 2011).

According to Kleindorfer, O'Neill and Ganeshan, (1998), in understanding the validation of simulation model and to deal with the problem of induction in research, the philosophical positions adopted by the observers have been objectivism and relativism. Objectivism is based on the foundationalism view that states that a model or theory needs to be verified through empiricism that means direct experience, or through rationality.

Historically, the majority of economists have classified themselves as objectivists (Kleindorfer, O'Neill & Ganeshan, 1998). An organisational example quoted by Kilduff, Mehra and Dunn (2011) is of Google, Inc. Google developed a search engine that helps in data mining and access to sources of information. Data mining is an empirical approach that is supported by foundationalism, also called the Received View (Kilduff, Mehra & Dunn, 2011). The problem however associated with this philosophical position is that direct experience in theory cannot be justified since many of the terms and propositions used are general and beyond empiricism (Kleindorfer, O'Neill & Ganeshan, 1998). The justification of true knowledge and the basis of foundationalism have also been discussed by Lakomski and Evers (2001) who have given an argument against the naturalism view of Willower's theory of inquiry considering its naturalist view to be incomplete.

In order to deal with this problem, the philosophy of science then focuses on instrumentalism that questions what exactly the general terms and propositions are. Milton Friedman represents the instrumentalist view by arguing that the focus should be on the predictions of the theory and not its assumptions, therefore, as far as the 'instrument' is correct even if the assumptions are wrong it should not matter. However, this has again been criticized by Cyert and Grunberg who state that even if the validity of a theory has to be based on predictions, then it should not yield wrong predictions that in case of Friedman did happen (Kleindorfer, O'Neill & Ganeshan, 1998). An organisational example following the instrumentalist view might be the hybrid organisation that provided solution for the Deep water Horizon in 2010 where the crisis team worked on the problem-solving approach.

The way philosophy of science is evident in different research approaches can be discussed by taking the field of consumer behaviour as an example that is based on several theories and research paradigm. Philosophy of science in the field of consumer behaviour is as important as in other management fields. Historically, this has been ignored and philosophical issues underpinning the research methods were never identified until 1983 where one of the researchers pointed out that the term construct validity used in many consumer behaviour researches have been employed differently (Bristor, 1985).

As mentioned earlier as well, Karl Popper's views on epistemology has still left an impact or a frame of reference for observing trends in management. To put this another way, philosophers like Popper do not come up with a theory on how a research needs to be conducted rather they provide a frame of reference (Armbruster & Gebert, 2002).

The Qualitative-Quantitative Debate

The qualitative-quantitative debate is responsible for highlighting the significance of philosophy of science for evaluators and since these evaluators are not philosophers, few of the common mistakes they make are that some are logical positivists, realism and causation seemed to be absent, experiments are inherently quantitative and experimenters are naïve realists or naïve positivists (Shadish, 1995). Another issue relating to quantitative and qualitative approach has been pointed out by Morgan (2007) who believed that there are methodological issues associated with combining the two different approaches. He pointed out that there has been a paradigm shift and increased significance is being given to the field of social sciences within the management research; thus, the use of qualitative approach has increased as a result. However, instead of treating the two approaches differently, qualitative is often used to assist the quantitative research. For example, mixed methods in research are being encouraged by teachers based on critical examination of philosophical assumptions (Mertens, 2010).

While there has an increased use of qualitative approaches, these approaches come with several limitations that the philosophical advocates fail to address adequately. Interpretative approaches have been seen as one of the new means used in organisational and management research to analyse and investigate some otherwise unexplored questions. Since the use of interpretative approaches follows objective methodological procedures, the appropriateness of these methods have been questioned by more extreme philosophical positions (particularly in hermeneutics, critical theory and deconstructionism).

These counterpoints to positivism reject the existence of objective reality in research and instead claim that the knowledge is represented through lived experience through reality. In order to achieve truth in research, communicative validity can be used as one of the criteria. This can be done by having a community of interpretation between the researcher and the participants that is possible if there is an understanding between the two in form of dialogue rather than one-way communication. In analysis of empirical material, the communicative validity can be used by having a relationship between the parts and the whole where for example, the parts of interview transcript needs to be seen as a whole, and the whole should be seen in parts (Minger, 2000; Sandberg, 2005). Riordan (1995) also agreed on using coercive-free communication in an open dialogue way that could allow the values and political commitments to be critically reviewed as well as the claims to knowledge.

By contrast, the use of critical realist philosophy in organisational research has been able to undergo verification and falsification; however, falsification can never be definitive and can be revised. If a theory is correct, it does not mean that all relevant data associated with it will be consistent. In management research, since various phenomena are studied, it also not able to undergo theoretical explanations even if competing hypotheses are presented. The main impediments that are there in management research include the untested assumptions used in research, inadequate research methods adopted and imprecise theories. The limitation faced by management researches are that they are not conducted under a closed system therefore the influence of external factors can hinder the interpretations or results of the research.

Backing Up, and Clarify the Pursuit of Knowledge

Classical epistemology holds that believing something to be true and even empirical evidence is an insufficient basis for knowledge (Cornford, 2003). While it may be evident that strength of belief holds little promise as the basis on knowledge, the limitations of empirical evidence are less obvious. Surely if we have accurate evidence and reasoned conclusions, we could say that we know something. However, no dataset is exhaustive, and not all alternate interpretations can be discarded. Empirical evidence is informative but imperfect. Hence, what we think we know appears to evolve as new evidence and reasoning becomes available. So did we really know anything in the first instance, if it now seems that that understanding was flawed?

Surely if knowledge is concerned with the true nature of the universe, and the laws of nature are constant, to say that we know something about nature should not change if indeed we understand the true nature of that aspect of the universe. This is a convergence between truth and belief as Plato put it (Cornford, 2003). To say that we know something therefore implies absolute certainty. If we are anything less than absolutely certain, then we may be wrong, and what we think we know may change. Strictly speaking, we do not know something to be a fact. While these notions have been challenged from time to time, it is based on this conception of knowledge that much of modern science was formed.

From the Renaissance to the Vienna Circle

In philosophical terms, modern scientific thinking did not fully immerse until the early 1900's, particularly when a group of philosophers gathered around Vienna University and began to formulate a modernist philosophy of science. They became known as the Vienna Circle. This group held that knowledge must be a product of both empirical observation and logical analysis (Sarkar, 1996).

While this may not seem much from a contemporary perspective, it was at the time a distinct stance against knowledge as a product of religious or royal doctrine, or even the abject subjectivity of romanticism which was still popular at the time. The goal of the Vienna Circle was nothing less than to unify scientific thinking, and distinguish it from other natural philosophies (the forerunner to the modern term of science) which had little foundation in empiricism and logical reasoning.

This line of thinking expanded and eventually coalesced into what we now know as logical positivism. The tenets of logical positivism have been characterised in a number of ways over the years, but without being exhaustive, the basic tenets of logical positivism are:

- That the universe is objectively real – its existence does not depend on our subjective perception, or lack of perception of it;
- That there is order in the universe. It is not a thing of abject chaos, but of order, even though that order may often be too complex for us to perceive. This tenet implied that if there is order then there must be natural laws that govern this order, and further implies that causal relationships must exist;
- That the purpose science is to come to know the nature of the universe, and each of its aspects;
- That the process of discovery should involve empirical verification of statements about some aspect of the universe;
- And this evidence should be subject to critique via a common language of logic and mathematical reasoning.

This list of tenets rarely appears anything other than manifestly obvious to most contemporary scientists, yet it is these elementary tenets of science have drawn considerable and sustained debate since the very moment of their inception (Achinstein & Barker, 1969).

While the bulk of the detractors to logical positivism can broadly be described as postmodernists, or only slightly more specifically as social constructivists, one should not gloss over the fact that postmodernism was by no means the only sources of criticism of logical positivism. Popper's classic critique, for example, directly challenged the idea that any proposition supported by empirical evidence could be considered verification (Popper, first published in 1934 and republished in English in 1959). He argued that an inability to falsify a proposition with empirical evidence was more compelling, and a much sounder basis of which to build scientific knowledge. To put this another way, no amount of studies that only attempt to confirm a theory are as convincing as the one study that attempted to falsify the theory and failed. This principal also relegated any theory that could not be potentially falsified, unscientific. This adopted staple of our modern scientific practice (null hypothesis testing) is often wrongly assumed one of the tenets of logical positivism.

The Challenge of Postmodernism and the 'Science Wars'

The exact definition of what constitutes postmodernists and one of its primary schools of thought- - social constructivism is hard to define. These are broad cultural movements that extend their influence into science. There is so much argument within, what I will for the sake of brevity call, the postmodernist movement, which discerning a single set of common ideas can be hard. The one thing that does seem to unite various schools of postmodernists is a reaction against the modernist scientific thinking reflected in logical positivism.

Contrary to some misinformation, no postmodernists actually challenge the idea that the universe is objectively real, though one philosopher has attempted this argument he did not refer to himself as a postmodernist, nor have any postmodernist lined up behind him. Their challenge to logical positivism is concerned with the remaining tenets of modern science. In essence, they contend that:

- That while there may be order in the universe, the nature of this order is subject to our subjective perspective. It appears to be the way it is only because we choose to look at it in the way we do. This is why 'scientific knowledge' appears to evolve as the way we look at things change. Scientific knowledge therefore is not objectively certain, and because it is not certain, it cannot be called knowledge, only belief (David Hume);
- Consequently, and perhaps most resoundingly, that if we cannot know anything for certain no matter how much empirical evidence and reasoning we apply, the purpose of modern science is futile. If the purpose of science is to come to know the nature of the universe, and this knowing is perennially uncertain, then the very reason for undertaking science is pointless;

- It follows then, that empirical verification is futile; and
- That logic and mathematical reasoning, which are themselves constructions based on imperfect perception, cannot be a basis for conclusions scientific endeavour may draw.

There are of course other optional and arguably less critical elements to the postmodernist position, but these depend on which particular group of thinkers you choose to attend to. Many contemporary scientists simply ignore this critique as a vexatious philosophical whim, which has little bearing on the practical conduct of modern science. Many other contemporary thinkers do not ignore this critique, and indeed these two dominant schools of thought have engaged in a war of words for decades now.

The Third Way: A Utilitarian Perspective

The idea of utilitarianism originated with the ancient Greek philosopher Epicurus, but did not emerge as specific school of thought before Jeremy Bentham (Rosen, 2003). However, it was the work of John Stuart Mill (Mill, 1859 and republished in 1974) that gave the philosophy prominence. Classical utilitarianism holds that the value of any endeavour is the degree to which it offers 'utility', which was originally interpreted to be hedonistic pleasure, but has later been reinterpreted as altruistic or eudemonistic doing good. Utilitarianism has not widely been seen as an alternative science of philosophy, but it does resolve some of the issues in the science wars.

The utilitarian perspective has no trouble with some of the postmodernist arguments. It is right to say that if we cannot know anything with absolute certainty. However, it does not follow that science is futile, merely that that purpose of science is futile. A utilitarian would say that the purpose of science is not to gain knowledge about the universe, but gain understanding that can be put to some practical good. Our understanding may not constitute certain knowledge, but as long as it can be put to practical good, it is worthwhile.

Utilitarian thinkers also agree with postmodernists that many phenomenon are completely or largely social constructions (psychopathology, money, crime, intelligence, and culture to name a few). However, saying something is socially constructed is not the same thing as saying it is not real. Prisons are social constructs nobody wants to be on the inside of one. Nor does the fact that something is a social construction mean that it does not have order to it, and that order is as open to empirical observation as the order in the natural world. Nor do the undeniable limitations of human perception necessarily distort our understanding of the universe in a way which is fundamentally false.

Finally, utilitarian thinkers agree with postmodernists that our knowledge is influenced by social processes. Scientists are influenced by the reviews of their peers. Studies are influenced by the purpose and amount of funding. Scientific thinking is influenced by the collective zeitgeist. However, none of this necessarily means the thinking is wrong. Indeed, some have argued that social processes that shape our understanding can aid in the accuracy of our science. What does remain true is that we all need to remain vigilant to the ways social pressures can silence the genuine pursuit of better and better understanding.

Utilitarian thinkers also agree with logical positivists that the process of discovery should involve empirical verification of speculation about aspects of the universe, and this evidence should be subject to critique via a common language of logic and/or mathematical reasoning. They would also add that the utility of the finding is an important consideration. Utilitarian thinkers also support the rebuttal of logical positivists that postmodernism is fundamentally nihilistic. Postmodernism offers no viable scientific alternative – either to the purpose or to method of science. It is therefore not a philosophy of science so much as a critique of a genuine philosophy of science. In short, postmodernism is not a science, it is anti-science. Further, it is not self-critical. It does not apply the same principles of reasoning to itself that it focuses on logical positivism. In this respect, there is a level of intellectual hypocrisy evident in postmodernism.

Clouding the Debate

A number of other issues not vital to the philosophical stance of postmodernism and social constructivism have not helped their case. In fact, postmodernists would help their cause greatly by distancing themselves from issues that only serve to cloud the debate. These are (in brief):

- Confusing popularity with being right.
- Arguing from a basis of misunderstanding scientific findings. For example, a particular favourite in this regard is misunderstanding the Heisenberg uncertainty principle.
- Some writings display a lazy-mindedness, an unexplained anti-mathematical stance, or simple anti-intellectualism.
- The language used in much of their writing is often idiosyncratic, tautological, or circular in reasoning. At worst, it can be incomprehensible, and even intentionally meaningless. This smacks of a pseudo-intellectualism designed either to flummox the reader or gratify the author's unjustified intellectual superiority than clearly elucidate the points being made.
- Postmodernism has attracted ideologues and activists of various types that harness a misunderstanding of some key elements of postmodernism to further their cause.

- Undertaking pseudo-scientific 'research' that is at odds with their basic proposition that all such endeavour is futile. This seems to be born of a need in many universities to publish, so many postmodernist 'researchers' undertake research-like activities to satiate their institution. Sadly, many universities accept this activity, when the skill and beliefs of these academics would be more appropriate in a philosophy department.
- Postmodernists misappropriate the qualitative banner. They employ 'methodologies' not subject to verification, and not concerned with representativeness or generalization. There is nothing about studying peoples' subjective experience that automatically aligns it with postmodernism. If one accepts that there is order in the subjective perception, experience, and cognition of people, then the utilitarian perspective can just as easily accommodate qualitative research. However, here the chosen methodologies are concerned with verification, representativeness, and generalization.

Summary

The greatest legacy of postmodernism is the justifiable critique of the logical positivism. While logical positivism may reemerge if the idea that the laws of nature are not constant gains credence, the critique remains unmet. The greatest failing of postmodernism is that it offered no viable alternative to the philosophical basis of the pursuit of knowledge. For now we are left with pragmatism – the conviction that if we cannot know anything absolutely, then it is only sensible to act on the best we know for now, and remain open to the possibility that this may change. If pragmatism has a weakness it is that the focus on the utility of research in the realistic absence of the pursuit of pure knowledge has implied a lesser value to fundamental scientific research. This state may not bother most funding bodies who often like to see the application of research for some definable outcome, but it does bother many scientists – many pragmatists among them.

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