

EMPIRICAL AND REALISTIC APPROACHES OF RESEARCH

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Abstract

This article presents the views and assumptions of logical positivism approach and realistic approach in conducting social science research in general and business research in particular. Logical positivism has influenced research methodologies in social science, in particular “model building”. The main assumptions of logical positivism are concerned with observation and “verification principle”. In the realistic approach of the social science philosophy, the conceptualization idea of theory plays a central role in social science research.

Introduction

The dispute between logical positivist approach and realistic approach to conduct social research is an important issue to understand the basic assumptions and theories used by business researchers. A fundamental issue in the philosophy of social science is the extent to which we can apply natural science research methods and methodologies to social science research (Bhaskar, 1978, Lawson, 1997, Dow, 1999). Bhaskar (1978) redefined the debate between natural science and social science as a dispute between a naturalist tradition based on positivist principles with its ideal of unified science and a rival anti-naturalist tradition. A distinction should be made between research methods applicable in natural and social sciences, based on the distinction between their respective subject matters.

In describing the logical positivism approach and the realistic approach, this article is organized as follows: the first section, after the introduction, discusses the emergence and assumptions of logical positivism that include the main propositions of logical positivism: verification principle and models building. The second section presents the views and assumptions of realism in conducting research in social science. The main realistic attacks on logical positivism approach are presented in the third section and the conclusion is given in the fourth section.

The emergence and assumptions of the logical positivism approach

The logical positivism emerged in the 1920s and 1930s as a consequence ideas of a discussion group of philosophers, mathematicians and scientists organized by Moritz Schlick (1882-1936) to investigate scientific language and methodology. The group is known as the Vienna Circle. David Hume (1711-1776), an empiricist, and the physicist Ernest Mach (1838-1916) influenced the development and underlying philosophy of the Vienna Circle, in particular its first idea of empiricism. Bertrand Russell (1872-1970) and Ludwig Wittgenstein influenced this group with their logical approach. Ludwig Wittgenstein's "Tractatus logico-philosophicus" had a significant influence on the circle's main tenet – the verification principle. Bertrand Russell and Alfred Whitehead formulated a new form of logic in their work "Principia Mathematica", which applied the logical tools of analysis to empirical investigation. This new logic was then adopted by the circle in their analysis.

"The term 'positivism', coined by Auguste Comte, in general is used as a name for a form of strict empiricism: the positivist maintains that only those knowledge claims which are founded directly on experience are genuine. Modern logical positivism, in particular the positivism of the Vienna Circle, is a form of positivism which accepts the symbolic logic of "*Principia Mathematica*" as its primary tool of analysis (Brown, 1977). Positivism is a theory of knowledge which only allows statements that are based on empirical data, collected through experience. Logical positivism is an extension of this concept and as is logical analysis and mathematical techniques. Logical positivism is a form of reasoning based on two key concepts, the collection of experiences yielding empirical data and the logical analysis of this data. Therefore, it imposes on its practitioners a structure of thinking and leads to a particular form of theory because only certain types of knowledge are allowed.

There are two central problems in the theory of knowledge: the problems of meaning and of truth. Logical positivists asserted that "Only meaningful statements were to be permitted scientific consideration and accorded the status of knowledge claims" (Caldwell, 1984). For logical positivists a meaningful statement is either analytic or verifiable. Analytical statements are concerned with tautologies; it is true for all values, or self-contradictions. Verifiable statements are concerned with empirical testing. The meaning of a statement, according to the principle of verifiability, consists of how it is verified or falsified. If a statement can not be

determined to be true or false, it is nonsense. For Hume, the basic element of experience was impression. Furthermore, Wittgenstein took the facts not just questions or happenings such as 'it is raining' but confirmed that 'it is raining at a given time and place'. Under such criteria, deriving a meaningful proposition entails the true source of knowledge. These purported propositions are:

- Formal proposition: tautologies and contradiction i.e. only determined by examining their form that they are meaningful. Tautologies i.e. agree with every truth distribution of atomic statements. For example the normal balance of any account (e.g. cash) is credit or debit. Contradictions i.e. agree with no 'truth' distribution of atomic statements e.g. the normal balance of cash is credit and is debit.
- Atomic proposition: determined by examining whether they conform or fail to conform to the facts e.g. the normal cash balance is credit.
- Molecular proposition: they are the truth functions of an atomic proposition and their value is determined by first determining the truth values of an atomic proposition and then applying the logical constants e.g. accounting equation: assets equals to liabilities and equity.
- Pseudo-proposition: different from the above; mere meaningless combinations of sounds and signs with no cognitive content; known as a metaphysical proposition, as they are not directly observable and hence cannot be tested. The problem of the external world is an example; this problem consists of such questions as; is there a world (or realm of objects) which exists external to our minds, like the world of matter? Or the problem of the self (or mind, or soul), the main question of concern here are: does the self exist in any real, substantial way, as a unitary, continuous entity? If so, is it a special mental, non-mental material substance, etc? In such situations, therefore, by the empiricist logic of logical positivism they are neither true or nor false; they are just meaningless and pointless to discuss.

Verification principle

In the simplest form, the principle stresses that the meaning of a proposition is its method of verification. Verifiability was then taken to be a standard for the pool of those propositions. Logic and mathematics were meaningful since they tell us nothing but what was implicit in what we knew already, as of their procedures defined a way of verifying any statement made within them. Empirical science was meaningful because it was based on a foundation of sensory

observation, which provided a method of verification for any empirical statement. Metaphysics could be rejected as meaningless because there was no way in which its statements could be verified. Caldwell (1984) reported the verifiability definition of Hempel as follows:

“... a sentence had empirical meaning only if it was capable, at least in principle, of complete verification by observational evidence, and such evidence was restricted to what could be observed by the speaker and his fellow beings during their lifetimes”

The central doctrine of logical positivism is the verification theory of meaning, that is, a proposition is meaningful if and only if it can be empirically verified *or* if and only if there exists an empirical method or evidence for deciding the truthness and falseness (Brown, 1977). Ayer (1946) formulated the notion of ‘weak verifiability’, which asserts that a sentence has an empirical meaning if some experimental propositions can be deduced from it in conjunction with other premises without being deducible from those other premises alone. ‘Weak verifiability’ can be formulated to make any sentence. To overcome the problems implicit in this approach, it is proposed the alternative notion of confirmation. Although it is not possible to verify the law, we can test it by its single instances. If in the continued series of such testing experiments no negative instance is found but the number of positive instances increases, then our confidence in the law will grow step by step. This is a gradually increasing confirmation of the law (Caldwell, 1984). Therefore, confirmation, whilst truth is an absolute concept independent of time, is a relative concept, the degree of which varies with the development of science. However, Ayer counter-argues that this is a confirmation definition, not an empirical statement, since the statement is not subject to verification. It is argued that this principle is not a statement but it is a rule and it is justified by its usefulness.

Deductive-Nomological Model and Inductive-Probabilistic Model

Logical positivists held a dominant view that theories do not explain a phenomenon, a generic term used to cover both events and process, e.g. earthquakes. Instead they believed that theories are only tools for describing certain correlation between observed phenomena. However, Comte and Mach and other positivists did not give any role to explanation in science. In 1948, Hempel and Oppenheim presented the Deductive-Nomological Model (D-N model) of scientific explanation. Logical positivists applied this model as their major approach to explanation and prediction. Brown (1977) cited Carl Hempel’s confirmation purpose as follows:

“It ought to be possible, one feels, to set up purely formal criteria of confirmation in a manner similar to that in which deductive logic provides purely formal criteria for the validity of deductive inference”.

The deductive nomological structure lies at the heart of Popper’s conception of science and has been widely advocated as an ideal form of explanation. Hempel proposes that sound explanation must fulfil four conditions, three logical and one empirical, the logical conditions of adequacy are the explanandum must be a logical consequence of the explanans or the explanans must pre-empt the explanandum, the explanans must contain general laws which are necessary for the deduction of the explanandum, and the explanans must have empirical content or capable of empirical testing. The empirical condition of adequacy is the explanans must be true. Explanandum means the sentence describing the phenomenon to be explained (not that phenomenon itself). Explanans means the class of those sentences, which are adduced to an account for the phenomenon. The D-N model emphasizes that any legitimate scientific explanation should be expressible in the form of a deductive argument, i.e. the explanandum should have a valid consequence of the explanans. Therefore, if the initial conditions and the general laws are met then the phenomenon described by the explanandum must occur.

On the contrary, the D-N models’ application is limited in the sense that it requires universal law (generalizations). Therefore scientific theories, which are based on statistical data, cannot make predictions to the same extent as universal laws. In order to overcome the above limitation authors developed a second inductive-probabilistic (I-P) model. In this model, the explanans comprises sentences expressed in statistical correlation. Thus, the requirement is now that the explanandum statement has a high logical or inductive probability of correctness. This model can be used for quantum mechanics, fluid dynamics, etc., because the laws in such disciplines cannot be universally applied, as they rely heavily on the statistical data and probabilistic predictions.

The D-N and I-P models have generally been found restrictive in the sense of their characteristics of what is to count as a legitimate explanation thereby excluding many types of explanations which are considered legitimate by scientists (Caldwell, 1984, 1988). The application has a limitation when the D-N model is applied to the statistical nature of the predictions. The legitimacy of the separation of two models of discovery and justification can be questioned. This questionability can be related to the following example, whether it seems

reasonable to suggest that in particle physics the construction of particle accelerators has demonstrated the existence of sub atomic particles, and that this has in fact led to discoveries of particles not previously suspected such as quarks.

Moreover, the position becomes also threatened on the basis of observations where observational statements are theory laden, i.e. the perception of the observer is conditioned by his knowledge and therefore he expects to perceive in a certain way. We may perceive a single cloud by utilizing clues of color, shape, background of sky outline, and many items of previous acquaintance stored in memory. We may then shift to observing a field of clouds and the accompanying sunshine and wind to see whether it is a good day for a sailing, kite flying, or a pessimistic day. Or a layman would perceive genetic codes to be mere alphabetic combinations as compared to geneticist who, having a vivid understanding of the facts would perceive them differently.

As indicated earlier, for the logical positivist, the only meaningful statements are those which can be verified by direct observation. The problem of inductive inference are related to scientific hypothesis and theories that are usually couched in terms that do not occur at all in the description of the empirical findings on which they rest, and which they serve to explain. Therefore, there could be no mechanical rules for producing the novel concepts found in the theories. On the other hand it is argued that past experience, knowledge, and the expectation of an observer are the major ingredients to draw the theories. Therefore, the assertion that scientific theories can be justified by supporting them inductively on the basis provided by observation weakens its sustainability with the above argument. Enormous effort has been made to develop appropriate descriptive language so that the empirical basis of the knowledge could be identified but none of the positivist so far has been able to come up with that (Caldwell, 1984, 1988).

The notion of empirical objectivity is another problem associated with empiricism. It is argued that all empirical sciences are objective, advance casual explanations and employ observational methods. The difficulties of collecting objective data based on observational methods will be considered before considering the nature of explanation and its relationship to prediction. One type of objectivity is linguistic objectivity. Linguistically objective statements are true whether or not a person actually states or thinks them. Another type of objectivity is the epistemic objectivity. Epistemic objectivity obtains if empirical data based on observations provides a basis for comparing different theories, which leads to one being chosen over another

one as being preferable. This is a move, as described by Caldwell (1984), towards the idea of no one theory being absolutely true and instead placing the emphasis on the comparison of competing theories.

The basic argument is that there is no such thing as objective information and that all information received by individuals from whatever source will have some form of meaning imposed on it by individuals' existing knowledge and beliefs.

Popper's demarcation between science and non-science

Popper, ensuring the demarcation between science and non-science, projects a philosophy based not on induction but deduction; whereby theories or conjectures are proposed and then tested via experience in order to attempt to falsify them. He promotes the idea that a preoccupation with highly probable hypotheses is the worst way to approach science and emphasizes again that universal theory can never be proved true or verified. Correspondingly, scientific theories begin as bold conjectures, as solutions to troubling problems. They are considered scientific if they can be subjected to severe testing; hence a scientific theory is falsifiable. Those theories that can be more severely tested, that forbid more, are said to have higher empirical content, and are preferred. The more a theory is tested, the more it is corroborated

Like the positivists, Popper's demarcation principle is based on empirical evidence but in a distinct mold. He believes that a 'system' is empirical or scientific if it (or its consequences) has been subjected to severe testing. Additionally, he extends that the inductive logicism belief that a scientific statement has to be verified is unqualified. His method is to be distinguished by applying it to a deductive method in order to analyze and describe. It is not the verification but the falsification of a scientific statement which is taken as a measure of demarcation, in order to admit to empirical statements those statements which cannot be verified.

What is the justification for the belief that the future will be largely like the past? What is the justification for inductive inferences? Problems like this are usually referred to as Hume's problems. Though logical positivists have put enormous effort into justifying the principle of induction on the grounds of logic and experience, no favorable outcome has yet been produced. The theory simply declares that scientific laws or hypotheses are not so much discovered as they are simply generated by inductive generalizations from a set of observed instances. For example, after observing 'n' similar instances of a given phenomenon the inductive leap is made to a

generalization or a universal statement concerning all past and future instances of the phenomenon. In other words, a sort of circularity occurs in the process of induction, where induction itself is questioned. Since 'n' similar instances of a given phenomenon led to the generalization, the argument is, therefore, an inductive one, and so cannot be used to justify the principle of induction. Under such situation the justification of induction has become the problem of induction.

For Popper, the crucial problem of induction is that it assumes that the future will be like the past or that there is justification for inductive inferences i.e. making valid inferences about infinite sets of events on the basis of finite sets of observed events. His response to this problem arose from Hume's criticisms whereby, as stated above, we are not justified in basing the future on experience regardless of the number of repetitions of the event in question. Hume does believe, however, that these expectations of the future in which many of us have great confidence can be accredited to 'custom' or 'habit' i.e. although we cannot prove universal theories to be true, we still believe them to be true. According to Popper, Hume raised two problems - a logical problem and a psychological problem. Hume's answers to these problems clash with each other i.e. it is irrational to state that we have faith via our habits and customs; Popper proceeds by reformulating Hume's problem. He agrees with Hume in that theory cannot be justified or verified by empirical reasons but that it can be falsified.

Popper, as a critical rationalist, strongly objects to the positivists' convictions with regard to induction in that it does not provide "a suitable distinguishing mark of the empirical, non-metaphysical character of a theoretical system" (Popper, 1968). That is, induction does not accommodate an appropriate criterion for demarcation that would allow the distinction between the empirical sciences on the one hand, and mathematics and logic [including metaphysics] on the other. Popper projects that this problem of demarcation is the most fundamental in philosophy. Hence, in his much acclaimed publication "The Logic of Scientific Discovery", Popper endeavors to formulate a fitting characterization of empirical science and metaphysics so that we may say of a given system whether or not it belongs to one or the other.

Statements of general scientific laws are not conclusively verifiable on the grounds of the verification principle because one exception could falsify them. It is impossible to verify every instance by the finite set of observational evidence. Karl Popper, in reply to this, suggested using the falsibility of a proposition rather than its verifiability so that differentiation could be made

between scientific and non-scientific statements. But there is also a limitation which occurs while applying falsibility that a fact can be shown to be false but never proven to be true. For example, let us say there is an abnormal lion which lives in the south-east of a Kenyan jungle. I cannot give conclusive proof of the fact by applying falsibility principle because the fact that I failed to find solid evidence would not mean that there is not an abnormal lion in the south-east of Kenyan jungle.

The most obvious of these criticisms is that if a statement can never be verified for the reason that we never know when we have reached the truth, on what grounds can Popper then state that they can be falsified. In response to this criticism, Popper devises that his proposal is based on an asymmetry between verifiability and falsifiability; that universal statements can be falsified by singular statements. There is a second kind of problem or rather question arising from the above which concern's the status of logical positivisms' own statement. This problem arose obviously from the domain of the principle of verifiability itself, i.e. the principle must be analytically true or empirically true, but it is neither a tautology nor an empirical statement. It is argued that if it is neither of these, then the principle becomes meaningless, and should be rejected as a metaphysical entity.

Realistic assumptions on the philosophy of science

Scientific explanation for realists is not the deduction of a statement describing an event from a set of other statements, but rather a description of the mechanisms that produce it. Sayer (1992) provides the following characteristics of realism which capture the nature of the realist's philosophy of science:

- The world exists independently of our knowledge of it.
- Our knowledge of the world is fallible and theory-laden. Concepts of truth and falsity fail to provide a coherent view of the relationship between knowledge and its object. Nevertheless knowledge is not immune to the empirical check and its effectiveness in informing and explaining successful material practices is not mere accident.
- The process of developing knowledge is not continuous or discontinuous. It is a simultaneous and universal change in concepts.
- There is necessity in the world; objects, natural or social, necessarily have particular causal power or ways of acting and particular susceptibilities.

- The world is differentiated and stratified, consisting of events and objects, including structures, which have powers and liabilities capable of generating events. These structures may be present even where, as in the social world and much of the natural world, they do not generate regular patterns of events.
- Social phenomena such as actions, text and institutions are concept-dependent. Therefore, the researcher has not only to explain their production and material effects but also to understand, read and interpret what they mean. Despite having to be interpreted by starting from the researcher's own frame of meaning and existing regardless of researcher's interpretation, science or the production of any kind of knowledge is a social practice. Therefore, social conditions and production of knowledge influence its content. The nature of language and the way of communication are not incidental to what is known and communicated.

Bahaskar (1978) distinguishes between transitive and intransitive objects of knowledge. The transitive objects are "Aristotelian material clause"; they are the raw material of science. However, the intransitive objects are the real, science-independent structures and mechanisms of the universe to which our theories attempt to make reference to. Intransitivity means that these constructions exist independently of human description of them. Bahaskar makes a contrast between the domains of the real, the actual and the empirical. The empirical domain consists of experience, obtained by direct or indirect observation. This domain should be differentiated from the domain of the actual which incorporate events, whether or not they are observed. These events may just happen and nobody observes them. Alternatively, these events may be too small or large, too fast or slow to be perceived. Finally, a further separation occurs between the domain of the actual and the domain of the real, comprising the processes that generate events. The absence of an event does not necessarily imply that there are no underlying forces towards change. It may just mean that other forces counterbalance these forces. A third level refers to the conception of causal relations as tendencies, grounded in the interactions of generative mechanisms of nature. These interactions may or may not generate events that, consequently, may or may not be observed. The causal structures and generative mechanisms are structured and intransitive. This means that they are relatively separate of the patterns and the human actions.

The concepts of causal mechanisms and structures are important in the realistic philosophy and the adequate causal mechanisms require the discovery of regular relations between phenomena and the mechanisms which link them. However, the mechanism is not

always accessible because of an intervening and countervailing mechanism and events. The mechanisms endure and act independently of human knowledge about them. Bhaskar (1978) states that the ontological distinction between scientific laws and patterns of events based on the real basis of causal laws that is provided by the generative mechanisms and causal laws must be analyzed as their tendencies. These tendencies may be regarded as the power or liabilities of a thing which may be exercised without being manifest in any particular outcome. This may give the impression that they are counter-factual. But realists argue that they are not counter-factual but they are trans-factual. Trans-factual statements are with factual instance in the laboratory and this constitutes their empirical basis.

One of the weaknesses of the Human concept of law is the connection of law to the closed systems. Closed systems are systems where a constant conjunction of events occurs. This means that neither the experimental establishment nor the practice of our knowledge in an open system can be sustained. In open systems laws can be universal only if they are interpreted in a non-empirical (trans-factual) way. Regarding realists, a dialectic model in science in which regularity is identified, a plausible explanation for it is invented and the reality of entities and processes presupposed in the explanation is then examined.

Realists argue that reality is layered and some layers are not available to sense perception. Therefore, it must be modeled before being known. If it is treated in this way, how can we move from our base in the sensory world to uncover the hidden layers and how do we know that there is a real world existing independently of us if its existence can only be postulated in thought? Absolute foundation is another problem for realism because realist philosophy cannot provide absolute foundations and the absolute foundation cannot be found. Therefore, realism can be dismissed, and there is no need to provide a better alternative.

Realists accept that the realist philosophy cannot provide absolute foundations. However, they argue that philosophy should not be rejected for failing to meet the criterion which neither realism nor its critics accept and it is not reasonable to reject realism without giving a better alternative. Bhaskar states that intransitive objects of scientific theory can be known. Knowledge of intransitive objects depends upon a rare blending of intellectual, practical-technical and perceptual skill. Ontological assumptions about real structures and generative mechanisms are not artificial constructs.

Events occurring in open systems do not necessarily manifest determined and recurrent patterns (Bhasker, 1978 and Harre, 1989) but they are subject to divergent causal variations (Tsoukas, 1989). To understand those events we have to understand the existence of the generative mechanisms and structures behind them. For realists the world is “de facto” comprised of real, complex and intransitive things, rather than atomistic things and their conjunctions. Isolating a particular generative mechanism in an experiment, scientists are able to test statements in conditions where the powers of that generative mechanism will be exercised and a mechanism will only have deterministic effects under such control conditions, where operations of other mechanisms are controlled. However, in open systems, huge numbers of differing mechanisms simultaneously exert their power to cause effects. The causality generated by a certain mechanism under observation may either be dormant for a while or may be countervailed or bent by other causal mechanisms at work, and thus cannot be treated as evidence of the nature of the generative mechanism.

Since inherent in the positivist assumption is one of closure (Bhaskar, 1978), it follows that scientific explanation is only deductive-nomological in closed system. Another related consequence is that the symmetry between explanation and prediction will be made possible only in the context of closed systems. In the real context of open systems, there are differing mechanisms that work at the same time and scientists cannot decide which mechanism will actually function. Therefore, events cannot be deductively predicted.

According to Sayer (1992), theories can be defined in any of three ways as follows:

“An ordering-framework, which allows observational data to be used for predicting and explaining empirical events;

- Conceptualization, in which theory building prescribes a particular fashion of conceptualizing events in the empirical world;
- A synonym of hypothesis and explanation, to be used interchangeably”
- The realist builds theories by referring to models (Keat and Urry, 1980) to describe the real essence of causal mechanisms and structures. Models, in the realists’ viewpoint, are vehicles carrying pictures of generative and productive mechanisms (Stockman, 1983), and they play the key role in scientific inquiry.
- A model is an attempted representation of the nature of the subject or what the model is dealing with. The subject, in the realist sense, is the causal mechanism and structure. This

model will be related to its known source. According to Stockman (1983), all the generative and productive mechanisms are only indirectly observable, quasi-accessible, or completely unobservable, inaccessible.

- By constructing a model, researchers can test it as a hypothetical description of actually existing entities and their relationship. Therefore, the model can be empirically tested. This testing could be by indirect testing of the truth or falsity of the theoretical statements or, by observation, to detect or infer the presence of entities designated by certain theoretical terms (Keat and Urry, 1980). This is contrary to the positivist idea of theoretical terms which must correspond to the observation language to be meaningful. If the model is not rejected by empirical test, this gives the researchers a good reason to conclude that the mechanisms and structures do exist. Therefore, the reciprocity between model constructing and testing will give an explanation of the original phenomena and the mechanisms and structures at work.

Realist declines the idea that we reach theories by an inductive route, by moving from concrete observations to generalizations. Generalization from 'some' to 'all' is not equivalent to proceeding from the observable to the unobservable structures which may explain them. Therefore, inductive propositions can never warrant the postulation of unobservable entities (Keat and Urry, 1980). The use of the "correspondence rules" is different in the realist and positivist viewpoints. For realist, the correspondence rules express actual causal associations between theoretical entities and observable phenomena. They are ways of indirectly inferring the presence or absence of items denoted by theoretical terms.

Realism and science

Bhaskar (1978) identifies a three-phase schema of development in science. Science identifies a phenomenon or a range of phenomena, constructs explanations for it and empirically tests its explanations, leading to the identification of the generative mechanism at work, which then becomes the phenomenon to be explained. This view of science renders the move at any one level from the manifest phenomena to the structures that generate them as the essence of science. The question for realists becomes to what extent it is possible to suppose that a comparable move can be made in the domain of social science.

Social structures have been defined in different ways in social science literature. Traditionally there are two schools, Weberian and Durkheimian. In the Weberian view, social

objects are seen as the results of, or constituted by, intentional and meaningful human behavior. Individualism, doctrines which conform to individualistic prescriptions including utilitarianism, liberal political theory and neo-classical economic theory, claims that social events are to be explained solely in terms of facts about individuals. Specifically, social events are to be explained by deducing them from the behavior of the 'participating' individuals and description of their situations. Individuals with their predicates are the atomistic entities for scientific investigation. By using the positivistic logic of adding these entities, society could be explained. One question for individualists is whether society as a whole is greater than the sum of its constituent parts, individuals. Or at the lower level, is 'army' just a plural of 'soldier'? According to Bhaskar (1978) this definition of society is misconceived, and sociology is not concerned with large-scale, mass or group behavior analyzed as a sum total of individual behavior. Rather, it is concerned with the persistent relations between individuals and groups, and with the relations between these relations.

The Durkheim school, in contrast to Weberian individualism, views social objects as possessing a life of their own, external to and coercing the individual. This conception collapses on its assumption that the social structures have the capacity to stand on their own apart from human activity. Also the inability of this model to deal with social change and the historic nature of society reduce its explanatory power. In the dialectical model, society forms the individuals who, in turn, create society; society produces people who produce society in a continuous manner. Therefore, a social structure is not independent from the human activity that produced it. According to this view, society is an externalization of people and people are the internalization in consciousness of society. To Bhaskar this is misleading for it encourages, in one way, a voluntary idealism with respect to our understanding of social structure and, in another way, a mechanistic determinism with respect to our understanding of people. Bhaskar argues that this model combines the error of the previous two models. Bhaskar states that people and society are not related dialectically. He points out that society would not exist without human activity, and that such activity would not occur unless the agents engaging in it had a conception of what they were doing. He also states that it is no longer true to say that men create it. Rather they reproduce or transform it. Therefore, if society is always already made, then any concrete human praxis can only modify it, and the totality of such acts sustain or change it. Bhaskar (1978) emphasizes that both society and human praxis must be seen as possessing a dual character. Society is both the

ever-present condition and the continually reproduced outcome of human agency; this is the “duality of structure”. Praxis is both conscious production, and (normally unconscious) reproduction of the conditions of production, that is society; he refers to this as duality of praxis.

Realism, or Transcendental Realism according to Bhaskar, regards the objects of knowledge as the structures and mechanisms that generate phenomena; and the knowledge as produced in the social activities. Realism considers the words existence independent of human knowledge about it. For realism there is distinction between the real structures and the mechanism of word and the actual patterns of events that are generated by these mechanisms. Bhaskar considers that only transcendental realism can sustain the idea of a law governed word independent of man (Bhaskar, 1978).

Empiricists consider that the statements about being can be reduced to or analyzed in terms of statements about knowledge. Bhaskar (1978) considers that the ontological question can always be transposed into epistemological terms and he calls it an “epistemic fallacy”. Science is a process dependent on antecedent knowledge, human activity, and the other raw materials of the practice of science. While the objects are neither phenomena (Empiricist) nor human constructs imposed upon the phenomena (Idealism), but real structures which endure and operate independently of our knowledge, our experience, and the conditions which allow us to access them (Bhaskar, 1978).

Transcendental realism and idealism agree that there can be no knowledge without the social activity of science and they reject the empiricist account of science according to which its valid content is exhausted by atomistic facts and their conjunctions. However, they disagree on the existence of the word without science. For realists the world exists independently of men, of human activity in general. This implies that whether there is science or not there is a nature and this nature is investigated by man, and what is discovered in nature must be expressed in thought. However, the structure, constitutions, and causal laws discovered in nature do not depend upon thought. For idealism, this order is actually imposed by men in their cognitive activity.

According to Bhaskar (1978), realist recognition of the social character of science satisfies the following two criteria that indicate the inter-dependence of ontology, epistemology and sociology.

- The non-spontaneous creation of knowledge, namely the production of knowledge from and by means of knowledge in the transitive dimension. This criterion is related to an epistemological-sociological view of scientific activity.
- The structural and essential realism, namely the independent existence and activity of causal structures and things in transitive dimension. This criterion highlights the ontological foundation of science.
- Causality, from the realist view, is not a relationship between discrete events, “cause and effect”, but the realist want to understand the continuous process of the events. This is a mode of inference in which events are explained by postulating, and identifying, mechanisms which are capable of producing them. This mode is called “retroduction”, and it may require an unidentified mechanism to be hypothesized (Sayer, 1992).

According to Sayer, it is often assumed that a useful way of understanding a complex object is to break it down into its constituent parts, either by abstraction or literally by taking it to bits. However he argues that this is not enough because we cannot explain their constituents. For example, the power of water to extinguish fire cannot be explained by deriving it from its constituent parts because we know that hydrogen and oxygen are highly inflammable. Therefore, a causal claim is not about regularity between separate things or events but about what an object is like and what it can do and only derivatively what it will do in any particular situation (Sayer, 1992).

Realistic attacks on logical positivism assumptions

According to Stockman (1983), positivism is identified by realism in terms of the basic assumptions and methodological postulates of deductivism. These assumptions consist of ontology of atomistic event, a view that propositions are the only proper vehicle for rational thought, and the belief that the ideal form for scientific knowledge is the deductive model. From these assumptions the essential empiricist methodological postulates are derived. Examples of these are the Deductive-Nomological model of explanation, the Hypothetico-Deductive method, the symmetry of explanation and prediction, and the principles of empirical invariance and of instance-confirmation or instance- falsification. Stockman clarifies and explains the dichotomy between positivism/non-positivism and naturalism/anti-naturalism as follows:

- “Positivist naturalism”: this is the doctrine according to which the methodological postulates of deductivism are to be applied in the same way in the social sciences as in the natural sciences. Therefore, this doctrine is to be rejected in the social science on the same basis as it is in the natural sciences.
- “Non-positivist naturalism”: this term is applied to doctrines which embrace a non-positivist account of the natural science methodologies; the position taken by scientific realism is to use these same methodologies in social sciences.
- “Positivist anti-naturalism”: Stockman interpreted this term as a doctrine which accepts positivist methodologies of natural sciences, but argues that these methodologies are not applicable to social sciences. Therefore, this opposes the doctrine of the unity of scientific method. Stockman argues that these doctrines are to be identified as a form as positivism as much as “positivist naturalism” doctrines. For realism, it is as positivistic to reject the unity of scientific method for the wrong reasons as it is to accept it for these wrong reasons. Bhaskar argues that “positivist naturalism” and “positivist anti-naturalism” are united in their common acceptance of an essentially positivist account of natural sciences and empiricist ontology.
- “Non-positivist anti-naturalism”: this class of doctrines rejects a positivist account of the methodology of natural sciences, and also rejects the doctrine of the unity of scientific method.

The realist attack on empiricism concentrates on two parts. The first part deals with what Sayer calls “misconceptions about knowledge” and the second part considers the failure of atomism. The major realist criticism of empiricism is centered on the empiricist conceptions about knowledge (Sayer, 1992), assumptions regarding causation, the model and the level of explanation (Bhaskar, 1978 and Stockman, 1983). The following are some of what Sayer calls the inter-related misconceptions about knowledge:

- “that knowledge is gained purely through contemplation or observation of the world;
- that knowledge we know can be reduced to what we can say;
- that knowledge can be safely regarded as a thing or a product, which can be evaluated independently of any consideration of its production and use in social science;
- that science can simply be assumed to be the highest form of knowledge and that other types of knowledge are dispensable or displaceable by science” (Sayer, 1992).

Sayer refers to mis-conception as “intellectualist fallacy” or “prejudice”, and he argues that knowledge is primarily gained through activity both in attempting to change our environment, through labor and work, and through interaction with other people, using shared resources, in particular a common language. This is because individuals cannot develop knowledge independently of a society in which they can learn think and act. Another misconception refers to the tendency to pedestal spoken or written forms of knowledge and to imagine that these are the only way in which meanings can be communicated and knowledge can be carried and applied. This tendency derogates that type of practical knowledge which does not require much linguistic competence. We have many skills that we are aware of and yet cannot describe verbally, and also many skills of which we are not aware.

Popper in “The Logic of Scientific Discovery” emphasizes that the empirical basis of objective science has nothing “absolute” about it. Science does not rest upon solid bedrock. The bold structure of its theories rises, as it were above a swamp, but not down to any natural or given base and if we stop driving the piles deeper, it is not because we have reached firm ground. We simply stop when we are satisfied that the piles are firm enough to carry the structure, at least for the time being (Popper, 1968). However, when do we know that the piles are ‘firm enough’? Bhaskar identifies two criteria for that adequacy of an account of science as follows:

- its capacity to sustain the idea of knowledge as produced by means of production and
- its capacity to sustain the idea of the independent existence and activity of the objects of scientific thought.

Further Bhaskar argues that the aim of science is the production of the knowledge of the mechanisms which produce the phenomena in nature that combine to generate the actual flux of phenomena of the world. The statement or ‘laws’ which describe the operation of these mechanisms are statements about the ways things would act in a world without men, where there would be no experiences and few, if any, constant conjunctions of events. According to Sayer, the tendency to think that knowledge is a product or a thing that we can possess and which is stored in terms of knowing, which is in the process of becoming, is a static view about knowledge. Realists challenge this view because they consider the production of knowledge as a social activity. To develop knowledge we need raw material and tools on which and with which we can work. These tools are linguistic, conceptual and cultural as well as material. Bhaskar argues that knowledge must be viewed as produced means of production and science as an

ongoing social activity in a continuing process of transformation (Bhaskar, 1978). The tendency to assume that science is the highest form of knowledge is what Sayer calls 'Scientism'. Behavioral science has attempted to follow this by adopting ideas which are based on the Mechanistic Model of Man, a Humean conception of cause that places stress on external stimuli and methodology of logical positivists. This has led to restrictions on experiments where the phenomena are analyzed into independent and dependent variables.

The second realistic critique of the empiricist view is the failure of atomism. Atomism means that the objects of experience are atomic, independent events which are the ultimate, particular elements of the world. The ontology of atomistic events and epistemology of atomistic impressions makes it difficult to assume the validity of knowledge of a general nature. Realists reject Deductivism because they argue that it would be illegitimate to generalize from the knowledge of finite sets of events in the past to universal statements which can predict events indifferent of place and time. The assumption of atomism give rise to problem of induction and causation, also the assumption of deductivism makes it difficult to provide a theory of causation or to distinguish a statement of an accidental succession of events from a causal law.

Conclusion

The importance of a philosophical movement does not lie in immunity from objection, rather in the ability to derive the interested critical reaction of those who think about the fundamental questions of philosophy. Logical positivists, with logical and meaning analysis, shifted the fundamental questions of philosophy towards 'what does p mean?' 'a way from how do we know p?' Logical positivism has influenced the social science methodology. This influence was reflected in the concern with the 'model building'. However, one of the imprecise central point about science is it rests on what Feigl (1969) calls the "Soil of observation" and has no presuppositions (Brown, 1977).

Researchers see an easy way to use empirical approach to conduct their research relying in the argument that all empirical sciences are objective. Two types of objectivity are notable: the first type of objectivity is linguistic objectivity. Researchers accept linguistically objective statements as true. The second type of objectivity is the epistemic objectivity. Epistemic objectivity obtains if empirical data based on observations provides a basis for comparing different theories, which leads to one being chosen over another one as being preferable. This is a

move, as described by Caldwell (1984), towards the idea of no one theory being absolutely true and instead placing the emphasis on the comparison of competing theories.

Realists see theory as a conceptualization idea, in which “‘theories’ mean to prescribe a particular way of conceptualizing something” (Sayer, 1992). This approach attacks the ordering-framework conception of theory, which allows for observational data to be implemented in order to explain and predict events. What actually is followed in the latter notion of theory is a two-stage process. In the first one, hypotheses are formulated and an ordering framework is composed. In the second, this framework is filled in and tested by these data. In this, the theory-laden proposition is violated. Therefore, social scientists should stick to the conceptualization idea of theory, because, otherwise, they may be carried a way by the erroneous filling procedure of the ordering-framework notion (Sayer, 1992).

Applying one form of research approach such as logical positivism and rejecting another such as realistic approach imposes on researchers a structure of thinking and leads to a particular form of theory because only certain types of knowledge are allowed. Neither observation alone nor conceptualization idea alone can explain a phenomenon.

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