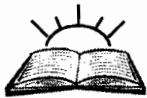


Unit 1

Logic of Inquiry in Social Research

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- 1.1 Introduction
- 1.2 A Science of Society
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Learning Objectives

It is expected that after reading Unit 1, you will be able to discuss the following themes pertaining to

- ❖ The debate over science
- ❖ The importance of scientific method
- ❖ The nature of sociology as a science of society.

1.1 Introduction

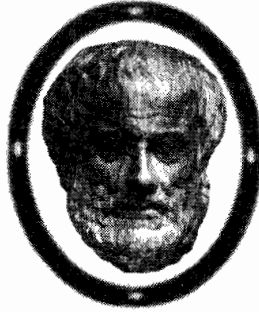
This is the first unit of Book 1 on *Research Methodologies*. In the style of a narrative, the unit begins with a discussion about the nature of sociology as a science of society and looks at science as a way to understand the world around us. The earliest mention of a scientific approach to understanding the nature of the social world along the lines of understanding the natural world is found in the works of Auguste Comte (1798-1857). From Comte's ideas, the discussion proceeds to observation in and methods of the social sciences. A scientific observation is capable of being turned into a higher-level generalisation or to build a theory (Unit 3 has a detailed discussion of theory building). Unit 2 will go into greater detail about how one goes about collecting empirical data in the social sciences and what constitutes "empirical approach" to understanding social reality. Let us now begin the debate over science in the social sciences.

1.2 A Science of Society

Social science research can be understood against the backdrop of a history of evolution of human thought. To begin with it is necessary to understand that the philosophical foundations of the science of sociology began in the West with its roots in Europe or in the early Greek philosophies. Aristotle was the first logician, who gave primacy to the faculty of reasoning of the human mind above what is handed down to us by tradition or custom (see Box 1.1 Aristotle). We are not trying to claim for our discipline lineage from Plato or Confucius, from the Mahabharata and the code of Hammurabi (see Becker and Barnes 1961). Rather we are looking into the logic of social inquiry and hence the reference to Aristotle.

Box 1.1 Aristotle

A student of Plato and the tutor of Alexander the Great, Aristotle lived around 300 BC. He put forward the most elementary form of a logical inquiry, namely a



Aristotle
(384-322 B. C.)

major premise, a minor premise and a conclusion. If the first two were correct or based on facts, the conclusion would be correct too. For example we have a major premise that all humans are mortal and a minor premise that Hari is a human, then the conclusion would be that Hari is mortal. This form of reasoning is known as Aristotle's theory of syllogism or deductive reasoning as opposed to inductive reasoning.

In the history of Western thought, Aristotle's logic dominated until 1600 AD and was also passed on to the Arabic and Latin medieval traditions. After about two thousand years, Galileo Galilei (1564-1642) in Italy, Francis Bacon (1561-1626) in England and Tycho Brahe (1546-1601) in Denmark and others found that though without any logical errors, Aristotle's deductive method of reasoning did not correspond to scientific inquiry about nature. As a result the followers of the new scientific method, known as inductive method of reasoning, turned deductive method upside down.

However for a long historical time, the advocates of logic had to fight with the domination of religion to establish the supremacy of human reason and mind over the supernatural domain or the will of God. Till almost the eighteenth century it proved to be a losing battle, at least in the West. It was with the Renaissance (a movement or period of vigorous artistic and intellectual activity beginning in fourteenth century Italy, lasting into the seventeenth century) that finally it was accepted that society is not a creation of God governed by a divine will but a creation of human beings and an entity that has an objective and changing existence that can be studied from the outside (see Box 1.2: Progressive Evolution of Societies).

Box 1.2 Progressive Evolution of Societies

The historians and philosophers of the late seventeenth and eighteenth century, such as Voltaire (1694-1778), Montesquieu (1689-1758), Hume (1711-1776) etc. projected certain basic premises regarding the truth of social existence. These were in the form of a universal history, holding a basic supposition that all societies are evolved and have gone through various transformations to be what they are today; an idea of progress that things are going towards better and the triumph of reason is the ultimate goal of human kind.



Voltaire (1694-1778)



Montesquieu (1689-1758)



Hume (1711-1776)

A science of society became possible when it was clearly understood and accepted by most that society is a creation of humans and not of God. The extent to which we can view sociology as a scientific discipline, a guiding principle of science is that we can derive valid knowledge from strict rules of evidence which are reliable and valid. In this sense, science encompasses along with other disciplines the discipline of sociology. By examining the relationship between sociology and scientific methodology that is followed by the natural sciences, we can understand if sociology is scientific in the same way as a natural science is. It is also possible to find out if sociology can be scientific even when it does not follow the methodology and methods of the natural sciences. For this purpose, we need to examine various methodologies followed by sociologists in their work and then appreciate the claim of calling sociology a scientific discipline.

All of us attach a special status to the notion of scientific knowledge because it depicts the world as it is rather than as anyone of us may wish it to be. In this sense scientific knowledge provides us the possibility of gaining a true understanding of the nature of the social and natural world. This understanding is not based on opinion or unproven faith and superstition. You can find the earliest developments of such understanding of sociology in the work of Auguste Comte. It is no accident that Auguste Comte is known as the founder of sociology. If we look at developments in sociological methodology, the word "sociology" obtains from the work of Auguste Comte. In order to appreciate sociology as a Science of Society, it is a useful exercise to outline Comte's ideas on the nature of sociology. This will give us an insight into the kind of scientific approach early sociologists followed. This approach gave an impetus to sociology to gradually develop into a reflexive science.



Auguste Comte
(1798-1857)

1.3 Comte's Ideas on the Nature of Sociology

Written in the nineteenth century, Comte's works reflect his engagement with the methodology of scientific thought. He argued that, like scientists who studied the natural world and discovered the nature of laws determining the behavior of matter in the physical world, it was possible to discover the laws which determined the behavior of people in the social world. In his book, *Course of Positive Philosophy* (published in 1839-1842), Comte made the point that laws governing the behavior of people in the social world could be discovered through the development of a positive philosophy of human social development. In other words, Comte was saying that social scientists could use the methodology and insight of the natural sciences as the model for the development of social physics or sociology. He gave the idea of positivism as given in Box 1.3.

Box 1.3 Comte's Idea of Positivism

In the ...positive state, the mind has given over the vain search after the Absolute notions, the origin and destination of the universe, and the causes of phenomena, applies itself to the study of their laws...their invariable relations of succession and resemblance. Reasoning and observation, duly combined, are the means to this knowledge. What we now understand when we speak of an explanation of facts is simply establishment of a connection between single phenomena and some general facts, the number of which diminishes with the progress of science.

We can say that in Comte's eyes, the aim of science was not to explain why things came into existence or the cause of their being. He held that the aim of science was the explanation of how things related to one another in terms of invariable and universal laws. In this sense, observable phenomena are the main ingredients of positive science, which aims to establish law-like relations between phenomena through gathering factual knowledge. Gathering of factual knowledge is carried out through observation, experimentation, comparison and prediction. The idea is that after discovering a wide range of laws, it would be possible to explain the laws in terms of their relationship to each other.

Positivism of Comte espoused that science means the progressive discovery of laws and their interrelationships so that science could one day propound a general law from which all other laws emanate. Comte assumed that the social world was as regular and objective as was the natural world. For him, social laws governed the social world just as natural laws governed the natural world. Comte, thus, considered the methodology of the natural sciences the ideal way to discover laws governing the social world and he advocated the development of a new positive outlook, based on the methodology of the natural sciences.

According to Comte, the main task of sociology was to discover the general laws of social development and he divided the general laws into the following categories.

- i) Laws of co-existence or social static: These laws governed the relationship between different parts of society and as such they determined the functions and interrelationship between the various parts.
- ii) Laws of succession or social dynamics: These laws governed social change and required an exploration of the way the nature and function of social institutions changed over time.

We may describe the above as Comte's positivism. Since there are various types of positivism, it is essential to understand the basic argument of scientific enquiry or inherent methodology of Comte's positivism.

As you know Comte followed the methodology of the nineteenth century natural sciences for positing the principles of natural sciences to the study of human social development.

Auguste Comte made, in the process, some assumptions and observations about social development. His assumptions and observations were according to the science of the nineteenth century.

Comte's first assumption was that societies pass through a process of evolution and their stages of development are from the simple to the complex. In this sense, societies gradually become more complex and institutionally differentiated, performing specific functions.

Next, Comte questioned that if there are incremental differences in societies, what makes them not disintegrate. According to Comte, mechanisms leading to social integration need to involve one or the other form of mutual dependence.

From the above two assumptions, Comte derived that evolution is both a natural and demonstrable fact and it is governed by Laws of Development. Comte argued that the task of sociology was to discover the Laws of Development by i) systematic observation, ii) collection of data or facts and iii) development of theories to explain the facts.

The logic of Comte's ideas is called inductivism (see Box 1.4 Distinction between Inductive and Deductive Forms of Logic).

Box 1.4 Distinction between Inductive and Deductive Forms of Logic

The deductive method takes a few axioms or so-called true statements with the aim of proving other true statements or theorems, which logically emanate from them. The inductive method, on the other hand, makes many observations about nature, with the aim of discovering a few but strong statements about how nature works or about what are the laws and theories that are at the back of how nature appears to us.

In the deductive method, logic is the main operating tool. If a statement emanates logically from the axioms, it must be true. In the inductive method (often called the scientific method), observation of nature is the main operating tool. If an idea is in conflict with what occurs in nature, the idea has to be given up as useless.

Adherents of traditional logic, who were the descendants of Aristotelean Logic, became rivals of those following the new inductive method of natural sciences, with different notions of reasoning or logic.

You may be interested in knowing that although science is inductive by definition (in the sense that observations are the only valid evidence of truth), the process of science can be deductive! *Stanford Encyclopedia of Philosophy* (updated August 23, 2004) on Aristotle's Logic mentions that 'more recent scholarship has often applied the very techniques of mathematical logic to Aristotle's theories, revealing (in the opinion of many) a number of similarities of approach and interest between Aristotle and modern logicians'.

We can also call Comte's logic as Inductive Positivism. This is also referred to as the nineteenth century positivism. (Positivism as a methodology developed in the twentieth century was quite different from what we have just learnt. You would learn more about positivism in later units of this book.) Based on the reasoning of his inductive positivism, Comte

gave three stages of evolution of human society, namely,

- i) the age of religion
- ii) the age of metaphysics and
- iii) the age of reason.

This was a position counter to the one professed by the Church that society in its most perfect form existed at the beginnings of creation and that human kind is going towards degeneration and more importantly the division of the world into Christians and non-Christians, to be equated with savages and non-humans. In the following Reflection and Action exercise, we are going to critically look at the methodological problems inherent in inductive positivism.

Reflection and Action 1.1

We will work out the basis of Comte's notion that it is possible to discover social laws in the same manner as scientists discover natural laws and then debate over the scientific approach of the nineteenth century sociology through the case of Comte's ideas. This exercise has four parts. Complete the first two parts (A and B) now and the last two parts (C and D) in Reflection and Action 1.2.

A

Answer the following questions and bring out Comte's assumptions about human development and write down the answers to the questions given below, on a separate sheet of paper.

Questions

- ❖ Does Comte answer the question of why do the laws of development governing the social world exist? Does he avoid answering this question? What is the implication of avoiding this question?
- ❖ Does Comte simply assume that social development is evolutionary or does he offer any evidence to prove this position?
- ❖ Is Comte assuming that the social world has a rational order, which is over and above the capacity of human consciousness to change it?
- ❖ Does he assume that the universe has some form of natural order that as sociologists we need to discover?

B

Based on your answers, work out if the nineteenth century sociology that relied heavily on data (facts) collection and theorising at the most abstract level, as evidenced in Comte's writings, was a victim of logical forms of methodological error, inherent in inductive positivism. For this exercise you would need to answer the following questions.

Questions

- ❖ Do you think that facts are self-evident things? Is it not the case that what I consider as a fact, you may interpret to be something else?
- ❖ Does or does not Comte's positivism tell us how to identify a fact in the first place?
- ❖ How are we to arrive at a common understanding of what is or is not a fact?
- ❖ Do the answers to the above questions imply that if facts have to be interpreted and not simply discovered to be facts, it is obvious that we tend to make a subjective judgment? Would you say that this is then not an objective method of scientific inquiry? Would you also say that it is not possible to theorise on the basis of such a non-scientific method of inquiry?

The issue coming out of the above exercise is as to how one identifies a social fact and how it is the same or different from a natural fact. The comparison of social science with natural science poses a clear problem, for while in the natural sciences the objects of study have a definite material existence, in the social sciences only human beings and their manifest behavior is the material but observation of behavior from the outside yields very little knowledge about the explanation of behavior. The existence of a rationally deductive objective reality is philosophically linked to what is known as the notion of duality exemplified in the philosophical notions of Descartes, best known as Cartesian duality (see Box 1.5 René Descartes (1596-1650)).

Box 1.5 René Descartes (1596-1650).

Born on March 31, 1596 in Tourain, France, René Descartes was one of the most significant and influential thinkers in human history. He was also an outstanding mathematician.

Cartesian duality presupposes the division between the outer objective reality of the phenomenon and the inner subjectivity of the observer. The premise is that for a scientific observation the two must remain separate and that the objective world has a rational reality that is akin to mathematical truth. Together with Spinoza (1632-1677) and Leibniz (1646-1716), he formed a part of what is known as the 'rationalist' school.



Descartes (1596-1650)



Spinoza (1632-1677)



Leibniz (1646-1716)

Let us now complete the Reflection and Action 1.2, that contains the other two parts of the earlier exercise. You need not worry about the right or wrong answers to questions. The idea of completing the exercise is to reflect and develop the skill of arriving at an understanding of how we employ logic to understand and know and on what basis.

Reflection and Action 1.2

C

If facts are the bases of theories, that is, if we develop theories to explain the relationship between facts, then as scientists we do not have any reasonable basis to make a distinction between good and bad or true and false theories. This is so because our theories are based on a collection of facts and we identify facts according to our subjective judgments about what is a fact. The whole process then is not conducive to production of valid knowledge that has been derived on the basis of irrefutable facts.

You can illustrate this idea by considering the following statement.
It is a fact that men are socially superior to women.

Questions

- ❖ On what evidence would you base your judgment that this is, or is not, the case?
- ❖ Are you able to explain this fact in another manner, if yes, how?
- ❖ Suggest how it is possible to make a distinction between different interpretations of the facts.

D

On the basis of the exercise you have just carried out, answer the following questions:

Questions

- ❖ If a sociologist agrees with the fact stated above, what sort of theory would she or he develop to explain the relationship between superior social status and gender?
- ❖ If a sociologist does not agree with the fact stated above, what sort of theory would she or he develop to explain the relationship between superior social status and gender?
- ❖ How can we show that the theory developed in the first is more, or less, valid than the one developed in the second?

The art of observation itself became a central methodological issue for social scientists, especially for those who had as their objective the study of society, as against the study of individuals (as in Psychology). The school of philosophers, known as the "empiricists", gave primacy to empirical facts as against the logical knowledge of the rationalists. Some of the philosophers of the empiricist school are John Locke (1632-1704), George Berkeley (1685-1753) and David Hume (1711-1776). The tussle for primacy between empiricism and logic is resolved in the social sciences by the need for both to come to a conclusion regarding social reality. The two ways of understanding social reality are known as the inductive and the deductive methods (see Box 1.4). By now most social scientists agree that the processes of inductive and deductive reasoning run simultaneously as one attempts to make sense of what is observed empirically, one has to rely on logic for interpretations. And again logic cannot be applied in a vacuum, it needs some kind of a solid referendum; even the imagination has its limits and cannot go beyond the frontiers of human comprehension that is ultimately linked to what can be humanly observed. Let us discuss the craft of observation as practiced in the social sciences.

1.4 Observation in Social Sciences

It is clear that unlike the observations conducted in the natural sciences that depend only on the senses of the observer, the observations in social sciences need the participation of the observed. While one can rely on the senses to see what is happening, one needs to inquire from the actors as to what is the meaning of their acts for any explanation to take place. Let us take for example the utter bewilderment a complete outsider would face if taken to witness a cricket match. The meaningless actions (observably) of adult men hitting a round object and running

around for no practical purpose and, worse, thousand of spectators getting so emotionally charged at the sight of such meaningless acts, would not appear reasonable to any outside and objective observer. The observer may put forward the verdict of collective insanity if not made familiar with the meaning systems that prompt the actions as well as a large amount of conceptual data as to: What is a game? Why is it played? What is the relationship between a game and national pride, and so on and so forth.

So it is with every act of observation of society that we need to refer to more generalised concepts and also meaning systems of the actors. This is not to say that one relies only on explanations given by the actors but true explanation in the social sciences would then contextualise the observations, the meanings and the actor's frame of reference to a larger and more generalised system of concepts and relationships, to try to get at a true meaning, truth or explanation. Thus inductive data is contextualised by a logical process or deduction. Social scientists have devised ways to make observation more meaningful or, as it is put, more scientific.

To understand this a little better we must go into the history of what constitutes data for the sociologists and anthropologists who have society and culture as their objects of study. As is evident, the nature of the data is itself sufficiently different from the data of natural sciences, as whatever we observe is a construct (Did you not find the same to be the case when you carried out the Reflection and Action 1.1 and 1.2 exercises?). Like when we observe a cricket match, the term "game" is a construct and unless we use this construct to explain whatever we are seeing physically, the entire observation would become meaningless. Thus as Dan Sperber (1982) has argued, there is only one-way to describe cultural (and social) phenomena and that is by interpretation. But even before we go into the problem of interpretation, we must be clear about what it is that we are going to interpret, in other words what is the nature of observation on which we rely as our base data.

To begin with, social scientists interpreted data or basic observations made by anyone. In the eighteenth and nineteenth centuries, travellers, missionaries and administrators collected large parts of data used. It is true that some of it still forms the basis of much of social theory, especially those accounts that could never be duplicated, as the situations, societies and cultures depicted in them have since disappeared. In the nineteenth century, the vogue was on a pure scientific methodology or on nomothetic[®] generalisations (see Box 1.6 Nomothetic and Ideographic Explanations).

Box 1.6 Nomothetic and Ideographic Explanations

As Windelband (1914) said, all explanations are of two types, nomothetic and ideographic. The former refers to generalised laws and the latter to individual facts. We may for example call the laws of evolution nomothetic and the specific events of history ideographic.

Since sociology is deemed to be a science of society, it aspires to be nomothetic rather than ideographic[®]. The attempt of the classical sociologists was thus to find the laws that make society run and the assumption was that society too has an objective existence like all natural objects and like all natural objects it too follows same laws or principles. The assumption of society as a natural phenomenon following laws of nature was to dissociate it from its earlier conceptualisation as a divine entity following supernatural dictates. However, to make society an object capable of being subjected to scientific analysis another criterion of scientific analysis had to be fulfilled, namely of ethical neutrality. Society and its norms had for long been entrenched within religion and cosmology so that most rules of society were viewed as divinely sanctioned rather than as a creation of humans; like incest taboos, norms of femininity and masculinity, etc. A science of society has to proceed from the premise that all such rules and norms are variable and human-made and therefore a science of society has to follow some principles of causality rather than of divine sanction. In other words all aspects of society have a purposive existence that can be explained rationally.

At this point, let us here remind ourselves about what Turner (2000) pointed out— that study of society uses, on the one hand, formal theory, with assumptions, concepts, propositions and laws and in this sense is similar to natural science, and as such it explores empirical data, practices and institutions and tries to find causal and generalisable statements (for example see Rudner 1966: 59-67, Braybrooke 1987: 21-29, Hempel 1942, Kincaid 1990, McIntyre Lee 1991). On the other hand, many sociologists and anthropologists (for example, Geertz 1983, McIntyre Alsdair 1973, Turner 1974, Sahlins 1976) have argued that given the diversity and multiplicity of the social world, it is not possible to develop generalisable and causal explanations. They hold that sociology's focus on observation of local action and interaction helps it to develop analyses of various social contexts. Irrespective of which perspective one accepts, in Turner's (2000:12) words, "social theory thrives and survives best when it is engaged with empirical research and/ or public issues". As a matter of fact, even the nineteenth century sociology was linked to a critical agenda toward the then social reality, for example, August Comte was linked to "programmes of political action" (see Barnes 1977: 42).

1.5 Logical Understanding of Social Reality

The question arises, what, then, is the legacy we have for logically understanding social reality? One way is to carry on with a discussion of ideas of sociologists (like we have done in this unit regarding Auguste Comte). They constructed their theories around an explanation of what they considered was new and unique in social reality. This exercise will take us to unmanageable detail and the unit will be extraordinarily long. So ending here with one example (of Comte's ideas) only, we will refer you to be alive and attentive to such discussions as and when they

appear in subsequent units of Book 1 and also in the units of MSO 001 (the course on Sociological Theories and Concepts). At this point in our discussion, it may suffice to say that important characteristics of scientific inquiry into social reality would include emphasis on relevant empirical sources of data, the general line of demarcation between observation and theory, the focus on logical consistency and deductive coverage. For understanding social reality, as Elster (1989) and Little (1991) say, social science research needs to discover regularities, derived from underlying causal properties of social phenomena. It is not necessary for us to draw an analogy between social sciences and natural sciences in order to stress the explanatory significance of discovering regularities in the social world. It is by now clearly understood that the social sciences cannot emulate the way natural scientists derive laws from the properties of physical phenomena. You may say that the social sciences do not require scientific explanation in terms of law-like regularities, all the same causal hypotheses, confirmed by empirical data are parts of the nuts and bolts of social science research. Methodologically, sociology, like any other social science, offers weak generalisations, which have only tentative predictability.

What kind of generalisations or regularities are we talking about? A law of nature refers to a governing regularity, that is, as per a particular law of nature, there will always be generation of a particular kind of behavior. For example it is a governing regularity that forces of electrodynamics affect protons and electrons. Phenomenal (or phenomenological as labeled by Cartwright 1983) regularities refer, on the other hand, to common features of social entities and their effects on individual agency. For clarification on this point see Box 1.7 Example of Phenomenal Regularity from Little (1992: 6).

Box 1.7 Example of Phenomenal Regularity from Little (1992: 6)

It has been observed, for example, that land-tenure systems with a particular structure create common incentives for individuals wherever they are implemented; it is then a regularity of these systems that they have common features (e.g. under investment in capital improvements). But these regularities are strictly derivative from features of individual agency, and they do not represent governing regularities of a certain kind of social institution.

1.6 Conclusion

Since social reality is highly diverse, and constantly experiencing cross cutting varieties of causation, it is possible only to produce scientifically valid knowledge in terms of "exception-laden phenomenal regularities" and "the highly qualified regularities that derive from institutional-logic analyses" (Little 1992: 20). In methodological terms, in the social sciences (that include sociology) we need to be aware of the scope and limits of generalisations possible in the light of the nature of our subject matter. Concluding this unit with the above note, we end at this point our debate

over science in the context of methodologies of social science research. We shall continue the debate in Unit 2 by discussing the theme of empirical approach, which social scientists use extensively in their researches and on that basis claim their endeavour to be scientific.

Further Reading

Worsley, Peter et al (ed) 1970. *Introducing Sociology*. Penguin Books: Harmondsworth (Unit 1 on 'Sociology as a Discipline', especially pp. 19-38 for sociology's main concern with 'learnt' behavior/ culture, interface between biology and culture, divisions of social sciences, relationships between sociology and other social sciences, scope of sociology and what sociologists do.

Giddens, Anthony 1987. *Social Theory and Modern Sociology*. Polity Press: Cambridge (Unit 1 on What do Sociologists Do?, especially pp. 1-21 about sociology and lay knowledge and current issues

Aaron, Raymond 1965. *Main Currents in Sociological Thought*. 2 vols. Harmondsworth: Penguin

