# Unit 2 : SCIENTIFIC METHOD IN SOCIAL RESEARCH

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## 2.1 LEARNING OBJECTIVES

After going through this unit, you will be able to -

- understand about scientific method in social research
- learn the debate between Kuhn-Popper about scientific method
- learn about different scientific methods used in social science
- learn about what makes these methods unified and scientific
- explain the debate of objectivity and subjectivity in social science research
- know about research ethics

## 2.2 INTRODUCTION

As already mentioned in the previous chapter, it is not the content itself, but the methodology followed that determines the scientificity of a

discipline. The same is true in the case of research in social science as well. Social science is considered to be a scientific discipline for the methodology it uses is scientific. Hence, the term is 'social science' in place of 'social studies'. There is a prolonged debate whether social science can properly claim the title of 'science'. For the present purpose, we can agree that social science is also a science since the methodologies followed here are scientific. It is enough here to look at only the scientific method in social sciences. In the previous unit, we have discussed about the meaning of research and different aspects of research. In this unit we shall try to understand about the ideas of Thomas Kuhn & Karl Popper regarding scientific thinking and research. We shall also get familiarised to different types of research and the concept of research ethics.

### 2.2.1 TheThree Stages Of Knowledge

According to classical Greek philosophy, knowledge is the only instrument, empowered with rationality and logic, to make a bridge to reach the truth. This knowledge has travelled over time. According to Auguste Comte, the founder of the discipline of Sociology and the 'first philosopher of science', from the initial knowledge derived from 'theology' knowledge gradually turned towards 'metaphysics', and the positivist thinking constructed what we call as 'science' today. It could be elaborated as below:

(i). The 'theological stage' was seen, from the perspective of 19th century France as preceding the Enlightenment. Here, man's place in society and society's restrictions upon man were referred to God. Man blindly believed in whatever he was taught by his ancestors. He believed in a supernatural power.

(ii). The 'metaphysical stage', is merely a modification of the first because a 'supernatural cause' is replaced by an 'abstract entity'. This stage is known as the 'stage of investigation', because people started reasoning and questioning although no solid evidence was laid. The stage of investigation was the beginning of a world that questioned authority and religion.

(iii). In the 'scientific stage', people could find solutions and explanations to social problems and bring them into force. Science started to answer questions in full stretch. The subsequent origin of the third stage could be traced to the famous maxim, "cogito ergo sum" that means "I think, therefore I am". Rene Descartes, who is regarded as the 'father of modern philosophy', propounded the maxim. Rather than simply believing in what is already there, this maxim pleaded to search and doubt reason for every occurred phenomenon. Science then became the dominant mode of thinking.

### 2.2.2 The Kuhn-Popper Debate

According to Karl Popper, 'falsification' is the basis of scientific thinking. Progression of scientific thinking could be made only through falsification and not through assumption. Let us take a simple example to have a clear understanding of falsification. Take a statement, "All crows are black". It is an assumption. But, if even a single crow could be found which is not black, the claim "All crows are black" would be dismantled. Therefore, there is no scientificity of the assumption. A new paradigm could be reached only through progress in falsification. Moreover, it is a production of new knowledge system along with falsification that creates scientific knowledge. In Popper we find arguments for open-endedness. He has denounced the certainty of knowledge. In his seminal work "*The Open Society and Its Enemies*", published in 1945, he has criticised 'teleological historicism'. Teleological historicism is based on the assumption that history unfolds inexorably according to universal laws. Plato, George W.F. Hegel and Karl Marx are being criticised for their insistence on this teleological historicist method.

As briefly mentioned in the first unit, Thomas S. Kuhn has rejected the notion of linear progress of science. He has said that there is always a scientific community whose ideas are dominant. In this period, the scientific community is busy in doing puzzle solving activities only. However, in crisis period anomalies arise and the

dominant paradigm is not able to respond to those. Then, scientific revolution takes place because of the incommensurability of the two paradigms. Karl Popper has criticised this by saying that there is no sacred or dominant paradigm in scientific thinking. Every paradigm is subject to falsification.



**CHECK YOUR PROGRESS**

Q1: Who is the author of *'The Open Society and Its Enemies'*?

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Q2: Who is the founder of the discipline of Sociology?

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## 2.3 SCIENTIFIC METHOD IN SOCIAL RESEARCH

In Social Science, conventionally either qualitative or quantitative methods were employed to study human society. However, in recent times, the mixed method, i.e. combination of both qualitative and quantitative methods is preferred. It is thought of as giving more accurate and reliable results than simply relying on either of the one. Although qualitative and quantitative methods are thought of as different, these are different in style and specific technique only. The goal of both is to make inference about social facts. Let us discuss these three methods.

### 2.3.1 Quantitative Research

Quantitative research uses numbers and statistical methods. It tends to be based on numerical aspects of the studied phenomenon. It is mainly concerned with the 'what' questions of human science. It uses measurements. This technique is easily replicable by other researchers. Statistics is the main tool of this research. Different surveys come under its purview. Hammersley

(1993:39) nicely provides a very useful definition of quantitative method. According to him "The term 'quantitative method' refers in large part of the adoption of the natural science experiment on the method for scientific research, its key feature being quantitative measurement of the phenomena studied and systematic control of the theoretical variables influencing those phenomena".

Thus, the logic of this research is to:

- collect data using standardised approaches on a range of variable
- search for pattern of causal relationships between these variables and
- test given theory by confirming or denying precise hypotheses.

### 2.3.2 Qualitative Research

It covers a wide range of approaches. Qualitative research is carried out in 'real life' setting. The objective is to take detailed descriptions of individual's behaviour and thoughts to illuminate their social meanings. These are not based on numerical measurements. Qualitative methods include in-depth interviews, ethnographic study, group analysis etc. It is much more descriptive and analytical in nature. It primarily deals with 'why' questions of social sciences. Usually, qualitative research is preferred on area studies. This is because in area studies the focus is on the history and culture of a particular area, and the particular area is discussed in full detail. Significantly the researcher in the qualitative research is likely to adopt an approach in which there is no precise initial specification of research issues and concepts. Here qualitative methods help.

### 2.3.3 Mixed Method

As has been said, mixed method is nowadays preferred by the researchers. It can give the study a more detailed picture of both its quantitative and qualitative aspects. For instance, in studying the demography of a particular place, for population growth rate, gender ratio, birth and death rate etc quantitative method, using

statistics would be helpful. At the same time, for geographical features, explaining interrelation of various phenomena, such as caste and income level, qualitative research would help. Hence, the mixed method would be followed.



**CHECK YOUR PROGRESS**

Q3: Fill in the blanks:

a) Quantitative research uses __ methods.

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b) Qualitative research primarily deals with __ questions of social sciences.

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## 2.4 OBJECTIVITY AND SUBJECTIVITY

As research in social science is carried on in human societies and the researchers themselves are human beings, there is the suspicion of the presence of subjectivity in the research. Whether the researcher would be able to distance himself or herself from the universe, i.e. the area of study, which he or she inhabits.

There is one argument posed by thinkers like Karl Popper - that all hypotheses should be value free, scientific and rational. It needs to challenge the existing knowledge system. Only value free hypotheses could perform this responsibility. If this argument is followed then the possibility of doing a research by an individual about his or her community would not be possible. Since, the individual is an encumbered self in his or her community. This nihilism is torn down by the argument of the opposite perspective, pursued by thinkers like Thomas Kuhn that all knowledge is merely relative to the dominant paradigm, except some rare, occasional crisis moments. However, in this kind of argument as well, there is a persistent nihilism. If all

knowledge is nothing but relative, then there would be little chance of progress of knowledge. Therefore, what could be seen as the correct reading of the dispute is to recognize the fact that mere objectivity is neither necessary nor sufficient for doing a scientific research. The fact that the researchers are human beings and subjects of the universe they are studying, could not be denied. At the same time, subjectivity in the sense of following the dominant paradigm would not help to carry forward the research. Therefore, what is necessary is the ability to locate oneself at the margin of the studied universe. Margin here indicates the boundary in the geometrical sense which ultimately gives shape to the rest of the universe. Locating oneself at the margin is essential as it would enable him to perform the role of a social critic, to draw the lines without necessarily abandoning his encumbered subjectivity. Moreover, what is the most important thing to do is to make explicit the subjective condition of the researcher. This comes under the ethics of doing research which we will discuss after a short while.

### 2.4.1 What Makes Research Scientific

There is a conventional view that whereas the qualitative research tends to be subjective; quantitative research is objective. However, this is not a correct assumption. As has already been mentioned it is only about differences in styles and techniques and not in the aim. Let us study now what unifies both as scientific research.

- The goal is inference: In all scientific research the aim is to explain phenomenon and make descriptive or explanatory inferences about different phenomenon. This is done on the basis of empirical information about the world.
- The procedures are public: Scientific research uses explicit, codified and public methodologies to generate and analyze data. Their reliability can then be assessed.
- The conclusions are uncertain: Inference is always an imperfect process. Its goal is to understand about the qualitative or quantitative data to learn about the world that produced them. However, this

knowledge can never claim certainty. It is always subjected to further examination, criticism, modification and rejection.

- The content is the method: As has already been mentioned in Unit 1, it is not the content that determines the scientificity of the discipline. It is the method that determines whether a discipline is scientific or not. Let us take a simple example. Astrology is not included under scientific discipline. Exclusion of Astrology is not based on the content. Rather it is because of the impossibility of further verification in Astrology that it is not clubbed under scientific discipline.

The above mentioned norms make a research scientific regardless of whether it is qualitative or quantitative or both.



**CHECK YOUR PROGRESS**

Q4: What makes all research scientific?

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Q5: Fill in the blanks:

a) Locating oneself at the margin enables one to perform the role of a __.

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b) The content is the __.

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c) The goal is __.

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Q6: If subjective condition is there, then what is the most essential thing to do?

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## 2.5 RESEARCH ETHICS

The background of the concern for research ethics could be seen widely in American Sociology in 1960s and later in German Sociology in 1990s. There emerge several tensions due to both, during and after effects of doing the research. In many instances, the subjects were taken in the research without their knowledge. There is instances of disclose of identity after the research work was published and the subject or group who has been studied were exposed to harassment, prejudice etc. These instances compelled the concerned people in social sciences to formulate some ethics while conducting research. Research ethics is a broad set of norms and principles that the researchers are expected to follow rather than some strict rules. Some of the research ethics are mentioned below:

- **Contribution to the existing literature:** The researcher should be well aware that they are contributing towards finding new facts and truth claims. It should not be repetitive of what has already been said or studied.
- **Applicability:** The researcher should attempt to provide insights which are applicable to ameliorate human conditions. These days, applied research is making popularity among the researchers because of the emphasis on applicability of the research.
- **Principle of informed consent:** Particularly in qualitative research, the participants must be made aware of the work going on. Their participation should be with their voluntary consent and that too an informed consent. Informed consent means that the participants are well aware of the fact that they are being studied under some research work. Many a times, the participants are unaware of the fact that it is simply research and not some government survey that is being carried on. The researcher should make an attempt to make them aware about this aspect.
- **Principle of damage avoidance:** After the research work is being published, many a time the subject population is subjected to harassment or prejudice. Therefore, the researcher should try to

maintain the anonymity of the participants so that no harms would occur to them after the work is published.



**CHECK YOUR PROGRESS**

Q7: What is principle of informed consent?

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Q8: What is principle of damage avoidance?

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## 2.6 LET US SUM UP

- It is not the content itself, but the methodology followed that determines the scientificity of a discipline.
- Auguste Comte is known as the founder of the discipline of Sociology and the 'first philosopher of science'
- Three stages of knowledge, according to Auguste Comte are 'theological stage', 'metaphysical stage', and 'scientific stage'.
- Man's place in society and society's restrictions upon man were referred to God in the theological stage.
- The 'metaphysical stage', is merely a modification of theological stage because a 'supernatural cause' is replaced by an 'abstract entity'.
- In the 'scientific stage', people could find solutions and explanations to social problems and bring them into force.
- Rene Descartes is regarded as the 'father of modern philosophy'.
- Rene Descartes propounded the maxim "cogito ergo sum" that means "I think, therefore I am".
- According to Karl Popper, 'falsification' is the basis of scientific thinking.

- *"The Open Society and Its Enemies",* published in 1945 was written by Karl Popper.
- Teleological historicism is based on the assumption that history unfolds inexorably according to universal laws.
- Karl Popper has criticised 'teleological historicism'.
- Plato, George W.F. Hegel and Karl Marx are being criticised for their insistence on the teleological historicist method.
- Thomas S. Kuhn has rejected the notion of linear progress of science.
- Although qualitative and quantitative methods are thought of as different, these are different in style and specific technique only.
- Quantitative research uses numbers and statistical methods.
- It is mainly concerned with the 'what' questions of human science.
- Qualitative methods include intense interviews, ethnographic study, group analysis etc.
- It primarily deals with 'why' questions of social sciences.
- Usually, qualitative research is preferred on area studies.
- Mixed method is nowadays preferred by the researchers.
- It can give the study a more detailed picture of both its quantitative and qualitative aspects.
- There is one argument posed by thinkers like Karl Popper that all hypotheses should be value free, scientific and rational.
- Thinkers like Thomas Kuhn argue that all knowledge is merely relative to the dominant paradigm except some rare, occasional crisis moments.
- Objectivity is neither necessary nor sufficient for doing a scientific research.
- The most important thing to do is to make explicit the subjective condition of the researcher.
- The norms that make a research scientific are - the goal is inference, the procedures are public, the conclusions are uncertain and the content is the method.

- Concern for research ethics could be seen widely in American Sociology in the 1960s and later in German Sociology in 1990s.
- Research ethics is a broad set of norms and principles that the researchers are expected to follow rather than some strict rules.
- Contribution to the existing literature, applicability of the research, principle of informed consent, principle of damage avoidance - are some of the norms in research ethics.



## 2.7 FURTHER READING

1) Gary King, Robert O. Keohane, Sidney Verba, (1994). *Designing Social Inquiry: Scientific Inference in Qualitative Research,* United Kingdom, Princeton University Press.

2) Imre Lakatos, *Falsification and the Methodology of Scientific Research Programs,* in *Criticism and the Growth of Knowledge.* In Schick: *Readings in the Philosophy of Science*.

3) Uwe Flick, Ernst von Kardorff, Ines Steinke *ed., (2004). A Companion to Qualitative Research,* London, Sage Publication.



## 2.8 ANSWERS TO CHECK YOUR PROGRESS

**Ans to Q No 1:** Karl Popper

**Ans to Q No 2:** Auguste Comte

**Ans to Q No 3:** a) statistical; b) why.

**Ans to Q No 4:** The norms that make a research scientific are - the goal is inference, the procedures are public, the conclusions are uncertain and the content is the method.

**Ans to Q No 5:** a) social critic; b) method; c) inference.

**Ans to Q No 6:** If there is a subjective condition then the researcher must make that subjective condition explicit in his research work.

**Ans to Q No 7:** Particularly in qualitative research, the participants must be made aware of the work going on. Their participation should be

with their voluntary consent and that too an informed consent. Informed consent means that the participants are well aware of the fact that they are being studied under some research work. Many a time, the participants are unaware of the fact that it is simply research and not some government survey that is being carried on. The researcher should make attempts to make them aware about this aspect.

**Ans to Q No 8:** After the research work is being published, many a time the subject population is subjected to harassment or prejudice. Therefore, the researcher should try to maintain the anonymity of the participants so that no harm occurs to them after the work is being published.



## 2.9 MODEL QUESTIONS

**A) Very Short Questions :**

Q1: Who used the word 'Falsification'?

Q2: What is the assumption of teleological historicist method?

**B) Short Questions** (Answer each question in about 150-300 words)

Q1: Explain Objectivity and subjectivity in social science

Q2: State the importance of Research ethics

**C) Long type questions** (Answer each question in about 300-500 words)

Q1: Distinguish between qualitative research and quantitative research.

Q2: Describe the stages of progress of knowledge with reference to Auguste Comte.

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