UNIT 2 COMPARATIVE METHOD AND STRATEGIES OF COMPARISON

Structure

2.0 Objectives
2.1 Introduction: What is Comparison
2.2 Some Thoughts on Method
2.3 The Comparative Method: Why Compare
   2.3.1 Social Scientific Research
   2.3.2 Integrative Thinking
2.4 Methods of Comparison
   2.4.1 Experimental Method
   2.4.2 Case Study
   2.4.3 Statistical Method
   2.4.4 Focussed Comparisons
   2.4.5 Historical Method
2.5 Let Us Sum Up
2.6 Key Words
2.7 Some Useful Books
2.8 Answers to Check Your Progress Exercises

2.0 OBJECTIVES

Comparison is a familiar exercise for all of us. Most decisions in our daily lives, whether buying fruits and vegetables from the vendor or choosing a book or an appropriate college and career, involve making comparisons. When comparison is employed, however, to study social and political phenomena, there should be something about ‘comparison’ as a ‘method’ which makes it more appropriate than other methods for the purpose. To assess this appropriateness, we first need to know what is the comparative method and how it can be distinguished from other methods, some of which also compare e.g., the experimental and statistical methods. We should also understand as to why, we should use the comparative method rather than any other method. Again, how one goes about comparing or planning strategies of comparison, is also important to bear in mind. In this Unit we will take up all these issues. After going through this unit you will be able to understand:

- What is method? What is the comparative method? How can the comparative method be distinguished from other methods?
- Why is the comparative method used? Which are the phenomenon which can be best understood/explained by this method?
- How does one use the comparative method in the study of politics?
- What are its relative advantages and disadvantages over other methods? and
- What is the significance of the comparative method to the field of Comparative Politics?

Each section ends with a question which will help you check your progress.

2.1 INTRODUCTION : WHAT IS COMPARISON

In the previous paragraph we noted how comparisons form part of our daily lives. None of us, however, live in a vacuum. Our daily lives are crisscrossed by
Comparative Methods and Approaches

In so many ways our own experiences and observations of our environment get shaped and influenced by those of others. In other words, our observation of our immediate world would show that people and events are connected in a network of relationships. These relationships may be close or emotionally bound as in a family, or as the network expands in the course of our daily lives, professional (as in our place of work) or impersonal (as with our co-passengers in the bus in which we travel). These relationships or interconnectedness, however, may show a regularity, a pattern or a daily-ness, and may also themselves be regulated by norms and rules e.g. the daily route of the bus, its departure and arrival timings etc. The idea here is to show that whereas each individual might be seen as having a specific daily routine, there is at the same time a cumulative or aggregate effect, where a number of such individuals may be seen as following a similar routine. The lives of these individuals, we can say, has a pattern of regularity, which is comparable in terms of their similarity. Now, when the similarities can be clubbed together, irregularities or dissimilarities can also be easily picked out. Explanations for both similarities and dissimilarities can also be made after exploring the commonalities and variations in the conditions of their lives. In order to illustrate this let us imagine a residential colony. The majority of the male residents leave for work by a chartered bus at 8 in the morning and return at 6 in the evening. Some residents, however, leave at 9 in the morning, in their respective cars, and return at 5 in the evening. The residents of the colony thus form roughly two groups displaying two kinds of patterns of behaviour. Explanations for both similarities within each group and dissimilarities between the two groups can be found by comparing individual situations or conditions in each group. While explanations for similarities can be seen in the commonalities in the conditions, explanations of irregularity or dissimilarities between groups can be explained in terms of absence of conditions which permit the similarity in one group e.g., it may be found that those who travel by bus have a lot of things in common besides going to their offices in the chartered bus such as same office, absence of personal vehicles, more or less similar positions/status in the office, location of offices on the same route etc. Those who travel by their cars, would likewise exhibit similarities of conditions within their group. The explanation for the different patterns between the groups can be seen in terms of the absence of conditions which permit similarities in the two groups e.g., the car group residents may be going to different offices which do not fall on the same bus route; they may be the only ones owning cars; their status in their offices may be higher etc. The explanations could be numerous and based also on numerous other variables like caste, gender, political beliefs etc. On the basis of this observation of similarities and dissimilarities, propositions can thus be made in terms of a causal-relationship e.g. men/women who drive to work do so because there are no chartered buses to their place of work or men/women who own private vehicles are more likely to drive to work than those who do not own vehicles or upper class women are more likely to drive to work etc. Let us move on from this extremely simplistic example to the complex ways in which social scientists use comparisons.

Check Your Progress 1

Note: i) Use the space given below for your answer.
   ii) Check your answer with the model answers given at the end of the unit.

1) Drawing from your observations of your surroundings do a simple exercise of comparison, looking for explanations of why some persons act in a particular way.
2.2 SOME THOUGHTS ON METHOD

Before we begin studying the comparative method, let us first see what exactly is a ‘method’ and why it is considered so important. Method as we know from our experiences, is a useful, helpful and instructive way of accomplishing something with relative ease. A piece of collapsible furniture, for example, comes with a manual guiding us through the various steps to set it up. While studying a phenomenon, method would similarly point to ways and means of doing things. We may not, however, unlike our example of the collapsible furniture, know the final shape or results of our explorations at the outset. We may not also have a precise instruction manual guiding us to the final outcome. We will simply have the parts of the furniture and tools to set it up in other words, ‘concepts’ and ‘techniques’. These concepts (ideas, thoughts, notions) and techniques (ways of collecting data) will have to be used in specific ways to know more about, understand or explain a particular phenomenon. Thus, it may be said, that the organisation of ways of application of specific concepts to data is ‘method’. Of course the manner of collection of data itself will have to be worked out. The concepts which are to be applied or studied will have to be thought out. All this will eventually have to be organised so that the nature of the data and the manner in which it is collected and the application of the concept is done in a way that we are able to study with a degree of precision what we want to study. In a scientific inquiry much emphasis is placed on precision and exactness of the method. Social sciences, however, owing to the nature of their subject matter, have had to think of methods which come close to the accuracy of scientific experiments in laboratories or other controlled conditions. A number of scholars, however, do not feel that there should be much preoccupation with the so called ‘scientific research’. Whatever the beliefs of scholars in this regard, there is nonetheless a ‘method’ in thinking, exploring and research in all studies. Several methods, comparative, historical, experimental, statistical etc. are used by scholars for their studies. It may be pointed out that all these methods may use comparisons to varying degrees. The comparative method also uses tools of the historical, experimental and statistical methods. It is also important to bear in mind that comparative method is not the monopoly of comparative politics. It is used in all domains of knowledge to study physical, human and social phenomenon. Sociology, history, anthropology, psychology etc., use it with similar confidence. These disciplines have used the comparative method to produce studies which are referred variously as ‘cross-cultural’ (as in anthropology and psychology) and ‘cross-national’ (as in political science and sociology) seeming thereby to emphasise different fields.

Check Your Progress 2

Note: i) Use the space given below for your answer.

ii) Check your answer with the model answers given at the end of the unit

1) What is method? Why do you think method is an important part of research?

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2.3 THE COMPARATIVE METHOD: WHY COMPARE

2.3.1 Social-Scientific Research

The comparative method has been seen as studying similarities and differences as the basis for developing a 'grounded theory', testing hypotheses, inferring causality, and producing reliable generalisations. Many social scientists believe that research should be scientifically organised. The comparative method, they believe, offers them the best means to conduct 'scientific' research i.e., research characterised by precision, validity, reliability and verifiability and some amount of predictability. The American political scientist James Coleman, for example, often reminded his students, 'You can't be scientific if you're not comparing'. Swanson similarly emphasised that it was 'unthinkable' to think of 'scientific thought and all scientific research' without comparisons. (Guy E. Swanson, 'Frameworks for Comparative Research: Structural Anthropology and the Theory of Action' in Ivan Valiier ed., Comparative Methods in Sociology, Berkeley, 1971, p.145).

Whereas in physical sciences comparisons can be done in laboratories under carefully controlled conditions, precise experimentation in social sciences under conditions which replicate laboratory conditions is not possible. If, for example, a social scientist wishes to study the relationship between electoral systems and the number of political parties, s/he cannot instruct a government to change its electoral system nor order people to behave in a particular way to test his/her hypothesis. Nor can s/he replicate a social or political phenomenon in a laboratory where tests can be conducted. Thus, while a social scientist may feel compelled to work in a scientific way, societal phenomena may not actually permit what is accepted as 'scientific' inquiry. S/he can, however, study 'cases' i.e., actually existing political systems and compare them i.e., chalk out a way to study their relationship as worked out in the hypothesis, draw conclusions and offer generalisations.

Thus the comparative method, though scientifically weaker than the experimental method, is considered closest to a scientific method, offering the best possible opportunity to seek explanations of societal phenomena and offer theoretical propositions and generalisations. The question you might ask now is what makes comparative method, scientific. Sartori tells us that the 'control function' or the system of checks, which is integral to scientific research and a necessary part of laboratory experimentation, can be achieved in social sciences only through comparisons. He goes further to propose that because the control function can be exercised only through the comparative method, comparisons are indispensable in social sciences. Because of their function of controlling/checking the validity of theoretical propositions, comparisons have the scientific value of making generalised propositions or theoretical statements explaining particular phenomena making predictions, and also what he terms 'learning from others' experiences'. In this context it is important to point out that the nature of predictions in comparative method have only a probabilistic causality. This means that it can state its results only in terms of likelihoods or probabilities i.e., a given set of conditions are likely to give an anticipated outcome. This is different from deterministic causality in scientific research which emphasises certainty i.e., a given set of conditions will produce the anticipated outcome/result.
2.3.2 Integrative Thinking

Integrative ‘thinking’ or looking for relations and connections: We saw in the previous paragraph that some social scientists use the comparative method to develop a scientific inquiry. For others, however, ‘thinking with comparisons’ is an integral part of analysing specific social and political phenomenon. Swanson for example, feels that ‘thinking without comparisons is unthinkable’. ‘No one’, he points out, ‘should be surprised that comparisons, implicit and explicit, pervade the work of social scientists and have done so from the beginning: comparisons among roles, organisations, communities, institutions, societies, and cultures’.

(Swanson, 1971, p.145) Emile Durkheim, the renowned German Sociologist affirms that the comparative method enables (sociological) research to ‘cease to be purely descriptive’. (Emile Durkheim, The Division of Labour in Society, 1949, p.139)

Even descriptions, however, points out Smelser, cannot work without comparisons. Simple descriptive words like ‘densely populated’ and ‘democratic’, he substantiates, ‘presuppose a universe of situations that are more or less populated or more or less democratic’ and one situation can be stated/described only in relation/comparison to the other. (Neil J. Smelser, Comparative Methods in the Social Sciences, Englewood, 1976, p.3) It is this ‘presupposition of a universe’ in which a descriptive category can be placed, within a set of relationships, helps us to analyse it better, feel quite a number of scholars. Manoranjan Mohanty therefore seeks to emphasise relationships rather than looking merely for similarities and dissimilarities among phenomena. The latter or the ‘compare and contrast approach’ as he calls it would ultimately become ‘an exercise in dichotomisation, an act of polarising’. In other words, such an exercise would lead to classification of likes in groups of isolated compartments so that a comparative exercise would become nothing more than finding similarities within groups and dissimilarities among them. For the identification of relationships of unity and opposition, one must modify one’s questions. This would mean that the questions asked should not be such as to bring out answers locating merely similarities and dissimilarities but ‘the relationship which exists between them’. Only then shall one be able to understand the comparability of political systems like the United States of America (U.S.A) and United Kingdom (U.K), for instance which differ in their forms of government (Presidential and Cabinet forms, respectively).

The need to look for relationships rather than only indicators of similarity and dissimilarity is also asserted by Smelser. Smelser feels that often a comparative exercise ends up looking for reasons only for differences or ‘dissimilarities’ and gives explanations which are often ‘distortions’. The fascination or preoccupation with the ‘new’ and the ‘unique’, in other words, what is seen as different from the rest, has always been part of human nature. Historically there has been a tendency to either praise these differences as ‘pure’ remainders of a previous age or see them as deviations from what is seen as normal behaviour. Thus the emphasis on similarities and differences may lead to similarities or uniformities being seen as norms and dissimilarities and variations as ‘deviations’ from the norm. The explanations offered for such deviations might not only be, ‘distortions’ but often lead to categorisations or classifications of categories in terms of binary oppositions, hierarchies or even in terms of the ideal (good) and deviant (bad). Often, in a system of unequal relationships, the attribution of differences and their reasons, results in the justification of the disempowerment of groups seen as different. We have seen in the history of colonialism that the colonised were deprived of freedom and the right to self governance. The colonising nation sought to justify this deprivation by describing the subject population as being incapable of self rule because it had different social structures and religious beliefs. The location of difference here came from the vantage point of power — that of the colonising nations. In such situations binary oppositions like the West and East may indicate countries or people not only described as having different
attributes but also separate existences even in terms of time. Thus while the colonising British were seen as having reached a stage of modernisation, the colonised Indians were seen to exist in a state of timelessness, in other words trapped in a backward past. Historically, however, we have lived in a world which is marked by what Eric Wolf calls 'interconnections'. Thus the appeal to look for relationships, is lent weight by Eric Wolf, whose work corrects the notion that the destiny of nations has historically been shaped by European nations while the others were merely quiet spectators. Wolf shows that historically interconnections have been and continue to be a fact in the lives of states and nations. (Eric Wolf, Europe and the People Without History, California, 1982). This means that looking for relationship is not only possible, ignoring such 'interconnections' will in fact be historically invalid.

Check Your Progress 3

Note: i) Use the space given below for your answers.

ii) Check your answers with the model answers given at the end of the unit.

1) How do comparisons help achieve the purposes of social-scientific research?

2) The purpose of the comparative method is to look for relationships rather than dichotomies. Elaborate.

2.4 METHODS OF COMPARISON

A variety of methods of comparison are used in social sciences.

2.4.1 Experimental Method

Although the experimental method has limited application in social sciences, it provides the model on which many comparativists aspire to base their studies. Simply put, the experimental method aims to establish a causal relationship between two conditions. In other words the objective of the experiment is to establish that one condition leads to the other or influences the other in a particular way. If, for example one wishes to study/explain why children differ in their ability to communicate in English in large-group setting, a number of factors may be seen as influencing this capability viz., social background, adeptness in the language, familiarity of surroundings etc. The investigator may want to study the influence of all these factors or one of them or even a combination of factors. S/he then isolates the condition/factors whose influence s/he wants to study and thereby make precise the role of each condition. The condition whose effect is to be measured and is manipulated by the investigator is the independent variable e.g., social background etc. The condition, upon which the influence is to be
studied, is thus the dependent variable. Thus, in an experiment designed to study the effect of social background on ability to communicate, social background will be the independent variable and the ability to communicate, the dependent variable. The investigator works out a hypothesis stated in terms of a relationship between the two conditions which is tested in the experiment viz., children coming from higher socio-economic background display better ability to communicate in English in large group settings. The results of the experiment would enable the investigator to offer general propositions regarding the applicability of her/his findings and compare them with other previous studies.

2.4.2 Case Study

A case study, as the name suggests focuses on indepth study of a single case. In that sense, while the method itself is not strictly comparative, it provides the data (on single cases) which can become the basis of general observations. These observations may be used to make comparisons with other ‘cases’ and to offer general explanations. Case studies, however, may, in a disproportionate manner emphasise ‘distinctiveness’ or what are called ‘deviant’ or unusual cases. There might be a tendency, for example, among comparativists to explore questions like why United States of America does not have a socialist party rather than to explore why Sweden along with most western democracies has one.

We will study briefly Alexis de Tocqueville’s classic studies of 18th century France (The Old Regime and the French Revolution, 1856) and 19th century United States (Democracy in America: Vol I, 1835; Vol II, 1840) to show how comparative explanations can be made by focussing on single cases. Both his studies seem to ask different questions. The French case attempts to explain why the 1789 French Revolution broke out and the U.S.A. case seems to concentrate on seeking reasons for, and consequences of, conditions of social equality in the U.S.A. While both these works were spaced by more than twenty years, there is an underlying unity of theme between them. This unity is partly due to Toqueville’s preoccupation in both with similar conceptual issues viz., equality and inequality, despotism and freedom and political stability and instability and his views on social structure and social change. Also underlying the two studies is his conviction regarding the inexorability of the Western historical transition from aristocracy to democracy, from inequality to equality. Finally, and this is what makes these individual works comparative, and according to some a single comparative study, is the fact that in both the studies the other nation persists as an ‘absent’ case or referent. Thus, his analysis of the American society is influenced by his perspective on the French society and vice versa. The American case was understood as a ‘pure’ case of ‘democracy by birth’, where the social evolution towards equality had ‘nearly reached its natural limits’ leading to conditions of political stability, a diminished sense of relative deprivation among its large middle class and a conservative attitude towards change. The French case was an aristocracy (a system of hierarchical inequalities) which had entered a transitionary stage in the 18th century, with conditions of inequality mixing with expectations and desire for equality, resulting in an unstable mix of the two principles of aristocracy and equality, leading to despotism, and culminating in the revolution of 1789. Thus Tocqueville’s unique case study of individual cases was effectively a study of national contrasts and similarities within a complex model of interaction of historical forces to explain the divergent historical courses taken up by France and U.S.A.

2.4.3 Statistical Method

The statistical method uses categories and variables which are quantifiable or can be represented by numbers, e.g., voting patterns, public expenditure, political
parties, voter turnout, urbanisation, population growth. It also offers unique opportunities to study the effects or relationships of a number of variables simultaneously. It has the advantage of presenting precise data in a compact and visually effective manner, so that similarities and dissimilarities are visible through numerical representation. The fact that a number of variables can be studied together also gives the unique opportunity to look for complex explanations in terms of a relationship. The use of the statistical method also helps explain and compare long-term trends and patterns and offer predictions on future trends. A study, for example, of the relationship of age and political participation can be made through an analysis of statistical tables of voter turnout and age-categories. Comparison of this data over long periods, or with similar data in other countries/political systems, or with data showing voter turn out in terms of religious groups, social class and age can help us make complex generalisations, e.g., middle class, Hindu, male voters between the age of 25 and 30 are the most prolific voters. Cross national comparisons may lead to findings like, middle class women of the age group 25 to 30 are more likely to vote in western democracies than in developing countries like India. The utility of this method lies in the relative ease with which it can deal with multiple variables. It fails, however, to offer complete answers or give the complete picture. It can, however, be employed along with qualitative analysis to give more comprehensive explanations of relationships and the broad categories which the statistical method uses in order to facilitate their numerical representation.

2.4.4 Focussed Comparisons

These studies take up a small number of countries,often just two (paired or binary comparisons), and concentrates frequently on particular aspects of the countries’ politics rather than on all aspects. Comparative studies of public policies in different countries has successfully been undertaken by this method. Lipset distinguishes two kinds of binary or paired comparison: the implicit and explicit. In the implicit binary comparison, the investigator’s own country, as in the case of de Tocqueville’s study of America, may serve as the reference. Explicit paired comparisons have two clear cases (countries) for comparison. The two countries may be studied with respect to their specific aspects e.g., policy of population control in India and China or in their entirety e.g., with respect to the process of modernisation. The latter may, however, lead to a parallel study of two cases leaving little scope for a study of relationships.

2.4.5 Historical Method

The historical method can be distinguished from other methods in that it looks for causal explanations which are historically sensitive. Eric Wolf emphasises that any study which seeks to understand societies and causes of human action could not merely seek technical solutions to problems stated in technical terms. The important thing was to resort to an analytic history which searched out the causes of the present in the past. Such an analytic history could not be developed out of the study of a single culture or nation, a single culture area, or even a single continent at one period in time, but from a study of contacts, interactions and ‘interconnections’ among human populations and cultures. The world of humankind constitutes a manifold, a totality of interconnected processes, and inquiries that disassemble this reality into bits and then fail to reassemble it falsify reality.

Historical studies have concentrated on one or more cases seeking to find causal explanations of social and political phenomena in a historical perspective. Single case studies seek, as mentioned in a previous section, to produce general statements which may be applied to other cases. Theda Skocpol points out that comparative historical studies using more than one case fall broadly into two
categories, 'comparative history' and 'comparative historical analysis'. Comparative history is commonly used rather loosely to refer to any study in which two or more historical trajectories are of nation-states, institutional complexes, or civilisations are juxtaposed. Some studies which fall in this genre, like Charles, Louis and Richard Tilly’s *The Rebellious Century 1830-1930*, aim at drawing up a specific historical model which can be applied across different national contexts. Others, such as Reinhard Benedix’s *Nation Building and Citizenship* and Perry Anderson’s *Lineages of the Absolutist State*, use comparisons primarily to bring out contrasts among nations or civilisations, conceived as isolated wholes. Skocpol herself subscribes to the second method i.e., comparative historical analysis, which aims primarily to ‘develop, test, and refine causal, explanatory hypothesis about events or structures integral to macro-units such as nation-states’. This it does by taking ‘selected slices of national historical trajectories as the units of comparison’, to develop causal relationship about specific phenomenon (e.g., revolutions) and draw generalisations. There are two ways in which valid associations of potential causes with the phenomenon one is trying to explain can be established. These methods laid out by John Stuart Mill in his *A System of Logic* are (a) the method of Agreement and (b) the method of Difference. The method of agreement involves taking up for study several cases having in common both the phenomenon as well as the set of causal factors proposed in the hypothesis. The method of difference, which is used by Skocpol, takes up two sets of cases: (a) the positive cases, in which the phenomenon as well as the hypothesised causal relationships are present and the (b) the negative cases, in which the phenomenon as well as the causes are absent but are otherwise similar to the first set. In her comparative analysis of the French, Russian and Chinese Revolutions, in *States and Social Revolutions, A Comparative Analysis of France, Russia and China*, (Cambridge, 1979). Skocpol takes up the three as the positive cases of successful social revolution and argues that the three reveal similar causal patterns despite many other dissimilarities. She takes up also a set of negative cases viz., failed Russian Revolution of 1905, and selected aspects of English, Japanese and German histories to validate the arguments regarding causal relationship in the first case.

Critics of the historical method feel that because the latter does not study a large number of cases, it does not offer the opportunity to study a specific phenomenon in a truly scientific manner. Harry Eckstein for instance argues that generalisations based on small number of cases ‘may certainly be a generalisation in the dictionary sense’. However, ‘a generalisation in the methodological sense’ ought to ‘cover a number of cases large enough for certain rigorous testing procedures like statistical analysis to be used’. (Harry Eckstein, *Internal War*, 1964)

**Check Your Progress 4**

**Note:** i) Use the space given below for your answers

   ii) Check your answers with the model answers given at the end of the unit.

1) What is meant by experimental method? How far is this method appropriate for the study of political phenomenon in a comparative framework?

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2) Design a problem of comparative politics using the statistical method.


2.5 LET US SUM UP

Studying with comparisons is important for understanding and explaining political and social phenomenon. A comparative method helps us to go beyond mere descriptions towards looking for ways in which political and social processes can be explained and based on such explanations general theoretical propositions can be made. It reminds us of the network of interconnections that exist among social, political, economic and cultural phenomena which help us understand better the changing nature of our environment.

Check Your Progress 5

Note: i) Use the space given below for your answers.
   ii) Check your answers with the model answers given at the end of the unit.

1) What are the different methods of comparison? What are the relative advantages of each in the study of comparative politics?


2) Can one compare without having a historical perspective? Give the advantages and disadvantages of the historical method in the light of this statement.


3) The comparative method helps in integrative thinking. Comment.


2.6 KEY WORDS

Control: a regulation or check - An important part of experiments where a parallel experiment or group of subjects is set up (control group) - to provide a standard of comparison for other experiment. In an experiment set up to study the effect of visual aids in learning, the control group will not be introduced with
the condition (visual aid) whose influence is to be studied.

**Causal Explanation:** A way of understanding something by holding that some fact(s) lead to the appearance of other facts e.g., overpopulation may be the cause of housing problem.

a) **Probabilistic Causality:** A probabilistic causality is said to exist when the statement of results and predictions are made only in terms of likelihoods or probabilities i.e., a given set of conditions are likely to give an anticipated outcome.

b) **Deterministic Causality:** Deterministic causality is the preferred way of understanding relationships in scientific research as it emphasises certainty i.e., a given set of conditions will produce the anticipated outcome/result.

**Generalisations:** A general statement made in a manner so that it can be seen as holding true in a number of cases.

**Grounded theory:** A grounded theory is a framework of explanations of specific events etc. or explanatory principles and ideas which are derived from systematic study and observations of facts.

**Hypothesis:** This is a statement which holds something to be true under some conditions e.g., land holdings would decrease continuously as population increases.

**Method:** Methods are ways of organising theories for application to data, also called ‘conceptual schemes’. Types of method comparative (using more than one case), configurative (using a single case study) and historical (using time and sequence). Method is more about ‘thinking about thinking’.

**Model:** In simple terms an intellectual construct which simplifies reality in order to emphasise the recurrent, the constant and the typical, which it presents in the form of clusters of tracts or attributes. In other words, ‘models’ and ‘types’ are treated as synonyms.

**Precision:** The attribute of being exact, definite or accurate.

**Predictability:** Something which can be predicted or expected/anticipated to happen.

**Reliability:** A test of credibility e.g., the reliability of a test is confirmed if it gives the same result (under the same conditions) every time.

**Techniques:** Techniques link method to the relevant data. Techniques vary in appropriateness - sampling, interviews etc.

**Theoretical Propositions:** A statement (like a generalisation) confirming or denying a relationship between two variables. The statement is expected to have a general application.

**Validity:** This is also a test of credibility, confirming soundness or adequacy, e.g., the validity of an experiment studying pressure differences will be confirmed if the data studied actually represents pressure differences and not something else, viz., temperature differences.

**Variables:** Something which is not fixed; something which is changeable; in an experiment a variable is a category which is subject to change by the experimenter [(a) independent variable] or as a result of the experiment.
[(b) dependent variable]. (c) Intervening variable: Variables which may occur in between and interrupt or influence the result.

Verifiability: Which can be confirmed or tested to be true.

2.7 SOME USEFUL BOOKS


2.8 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1) Write on the basis of your personal observations.

Check Your Progress 2

1) See Section 2.2

Check Your Progress 3

1) The comparisons are undertaken on the basis of testing hypothesis, inferring casualty and producing reliable generalisations. As such they are characterised by precision, validity, reliability and verifiability the necessary aspects of scientific research.

2) See Sub-section 2.3.2

Check Your Progress 4

1) See Sub-section 2.4.1

2) Design on the basis of what you have learnt in this unit.