
UNIT 13 ORGANISING RESEARCH FINDINGS

Structure

13.1 Introduction

Aims and Objectives

13.2 Statement of the Problem

13.3 Theories and Hypotheses

13.4 Analysis and Interpretation

13.5 Testing of Hypotheses

13.6 Organising Findings of Case Study

13.7 Summary

13.8 Terminal Questions

Suggested Readings

13.1 INTRODUCTION

Imagine an M A student undertakes a small, but innovative research project, imaginatively conceptualises the research problem and the research design, executes it and derives his findings. You do not expect him to 'organise' his findings, for example in terms of only of percentage tables, or higher order analyses, without any (a) introduction to how he happened to choose 'this' particular problem; (b) how he made the problem researchable; (c) how he assembled a theory and derived his hypotheses; (d) how he designed an appropriate research design, and tool of data collection; (e) how he collected his data and analysed them; (f) what his findings are; and, (f) what his explanations and speculations are. If he gives his findings only in terms of tables or as a narrative conclusions as in the case study, or analysis of qualitative or social anthropological data, you will not be interested in them, nor will you understand them. Hence any attempt to organise the 'research findings' of any research project without any elementary introductions of (a) what the research questions and objectives were; (b) how a particular research design (viz. case study, survey, etc.) was necessary; (c) how the data were (quantitative or qualitative) analysed, will not be understood by the readers.

Aims and Objectives

This Unit would enable you to understand

- The process of organising the research findings;
- The relevance of testing of hypotheses; and
- Analysis and interpretation of the data.

13.2 STATEMENT OF THE PROBLEM

Most of the times research problems occur to you in a very vague form. They are

generally huge, and unmanageable. The more immersed you are in your field, the more intensively you have studied the related literature, the more likely you are to raise focused, sharp and manageable research problems. But most of the M. A. level students toy, to begin with, with huge, vague and unmanageable topics: like Maoist insurgency, women's empowerment, and women in politics, etc. Take the topic of women in politics. A vast variety of subtopics can be covered under this topic. For instance, Gandhiji and entry of women into the national movement; women's participation in the 1942 Quit India movement, representation of women in the Lok Sabha, State Assemblies, etc. After the Panchayati Raj (PR) Amendment of 1992 to the Constitution, requiring the states to reserve seats for Scheduled Castes and Scheduled Tribes and women, in the PR institutions and municipalities, the representation of women in these bodies has gone up. If you have read about women in politics, empowerment of women, patriarchy in India, health of women and children; studied the PR election results, and if you have interacted with Non Government Organisations (NGOs) concerned with women, you will most probably gravitate to a specific research problem of women members of the PR institutions. But, then there are three levels of such institutions: village, *taluka* and the district. After much thinking you might choose for your research the topic of "Women Members of the District Panchayats." While organising your research findings, you should not narrate the torturous process you had gone through. Instead, you should dwell in the Introductory chapter on the following points.

- The nature of the Indian society and the traditional position of women.
- The traditional saying: a girl, as a daughter, is dependent on father; as a wife she is dependent on her husband; and as a mother she is dependent on her son. The role of patriarchy.
- Subjugation of women in family.
- No equal pay for equal work for both men and women.
- National movement and attempts to reform the condition of women.
- Reformers like Jotiba Phule, Maharshi Karve: women and education.
- The Gandhian phase of the Congress and women's entry into the national movement.
- Increase of women in professions, but rarely in politics.
- PR Amendment of 1992.
- Beginnings of change in rural India.

This introduction has sharpened the focus of your research. Also, it will fix the attention of the reader on the topic. In the context of the above, you should raise the research questions like the ones given below:

- To what extent are the women members aware of the scope and power of the District Panchayats (DPs)?
- How much are they interested in politics?
- In which areas of the PR administration are they most interested?
- To what extent are the officials of the PR prompt in responding to their suggestions?

- To what extent can the women members of PR count on the support of the male members of the DPs?
- To what extent can they raise the issues of their choice in the meetings of DPs?
- To what extent do they like the standing committees they have been assigned to?
- To what are they happy with budget allocated to the DPs by the state government?
- Other related issues.

With the help of the above research questions, you can carry out a good research project. But, after collecting and analysing the data, you will produce only univariate or single variable tables.

You will not be able to explain anything. For example, what kind of women members are more likely to feel that their suggestions are heeded or not by the officials? So, you will have to develop objectives of your research on the basis of the above research questions. While organising the findings of your research project, the role of research questions is important. Your findings will be as clear as your research questions are. Again your theory will be as clear and innovative as your research questions are.

On the basis of your research questions, you will develop the objectives of your research. For example, the following objectives can be developed from the above research questions.

The major objectives of the proposed research are:

1. To ascertain the levels of political socialisation and political awareness of the women members of the DPs in the State of Maharashtra;
2. To find out their prior political experience.
3. To ascertain the issues uppermost in their views.
4. To ascertain the kinds of experience they have with the officials associated with the DPs.

5. Most importantly, to ascertain the factors affecting the variance in the above.

Unless you raise the last objective, i.e. “most importantly, to ascertain the factors affecting the variance in the above”, you will not be able to theorise about your problem, and therefore explain your findings. **Research is all about ascertaining and explaining the variance, or difference.** If, for example, all women members of a DP were equally satisfied with the work of the officials, there is no scope for research. If some women members are satisfied, and if some others are not, then there is scope for research. **If you cannot speculate regarding “the factors affecting...,” there cannot be any theory. In the absence of a theory, there cannot be any cross-tabulations, and explanations of your findings.** You will be saddled with the research findings in terms **univariate** or **single variable** tables, which cannot be explained, e.g., levels of political awareness. Even to collect **qualitative** data, say, regarding energetic women members of a DP, their being conduit or pipeline between the Non- Governmental Organisations (NGOs) and DP, the bipartisanship of some women members, i.e. working for needy people without regard to the latter’s party preferences, analyse the data, organise the finding in terms of a thick description, you need an appropriate theory.

13.3 THEORIES AND HYPOTHESES

In one of the previous Units, you have studied the nature, structure and role of theories. It needs to be briefly recapitulated here. A theory is a network of available generalisations, hypotheses (or anticipated relationships between variables), and assumptions. In the case of the present example of women members of the DPs, you will have to anticipate: women with what kinds of backgrounds are more likely to be interested in which issues. You will also justify the anticipation or prediction. This network of relationships among the variables and their justification constitute a theory. There is nothing mysterious or frightening about it. Theories function throughout inquiry: in formulating a problem, deriving the hypotheses, in operationalising the variables, in designing the cross tabulations - you cannot cross tabulate any variable with any other variable without any justification - and explaining your findings.

Hypotheses

A hypothesis is tentative and testable statement regarding the relationship between two or more variables. E.g., in the context of the above: the following hypotheses have been suggested to be tested with the help of hypothetical, but almost realistic, data:

- The forward caste women members, as against the OBC and SC/ST members of DPs are more likely to feel that the officials are more likely to respond promptly to their suggestions.
- The higher the level of education, the higher the level of interest in politics.
- The higher the level of education of the women members, the more they are interested in educational activities of the DPs.
- The more the interest in politics, the more the women members are likely to expect prompt response from the DP officials.

Tools of Data Collection

The above research problem requires a survey design, with interview schedules as the tools or instruments of data collection. The reason is, you cannot ascertain information regarding the women members' opinions about the DP officials, their interest in politics, their priority areas of civic facilities, etc. without approaching them. It is always advisable to construct an interview schedule after a freewheeling discussion with a few women members.

Sampling

This research problem is amenable only to the sampling design. Please state what type of sampling you have resorted to, what the sample size you aimed at was and what the achieved sample size was.

13.4 ANALYSIS AND INTERPRETATION

While organising, analysing and reporting your finding of a research study, you will first examine the univariate table for each of the variables. This is to check for the wrong coding. It is also a good idea that you present in the analysis chapter the univariate tables regarding the major independent variables, here in this age, caste and education.

These are the major characteristics of the sample. The following tables (based on hypothetical, but almost realistic data) have been prepared with the help of Statistical Package for Social Sciences (SPSS). As a first step in reporting, those univariate tables should be presented, which deal with age, caste and educational level, etc. so that the reader can understand the characteristics of the sample. Table 1 shows the distribution of women DP members by age groups.

Table 1 Respondents by Age

Age categories	Percent and (N)
<30 Years	38% (39)
31 -40	24% (24)
41+	39% (39)
Total	100 % (102)

Hypothetical

It is seen that the respondents in the age group of 31-40 are about one – fourth, those in the age groups of less than 30 years or of 41 or more constitute more than one third. This reflects both the distribution of tickets and the voter's choice.

Table 2 Respondents by Caste

Caste category	Per cent (N)
Forward +others	19 % (19)
OBC	44 % (44)
SC/ST	39 % (39)
Total	100 % (102)

Hypothetical

In the sample, as the Table 2 reveals, about one-fifth belong to the forward castes and others. More than one third belong to the SC/STs.

**Table 3
Respondents by Education**

Caste category	Per cent (N)
Some Primary	38 % (39)
Some secondary	43% (44)
Secondary+	18% (19)
Total	100 % (102)

Hypothetical

Table 3 reveals that, more than two fifth of the women members had some secondary education. More than one- third of them had only some primary education.

In the above hypothetical tables, the percentages in the Total percentage or the sample norm column should not be compared with the population parameters of the state you

have chosen, because the total women members of DPs constitute the population of the universe for your sample. Also the SC/ST proportion depends on their proportions in the districts.

13.5 TESTING OF HYPOTHESES

Hypothesis 1: The forward caste women members (and others), as against the OBC and SC/ST members of the DPs, are more likely to feel that the PR officials are more likely to respond promptly to their suggestions. (see Table 4.)

Table 4
How the officials respond by castes of respondents
(In percentages)

How officials respond	Castes of the respondents			Total% (N)
	Forward+ Others	OBC	SC/ST	
PR officials indifferent	22%	21%	69%	39%
Some delay	21	48	21	32
Promptly	58	32	10	28
Total %	100%	100%	100%	100%
Total (N)	(19)	(44)	(20)	(102)

Hypothetical

For the principles of interpreting a percentage frequency distribution table, see Unit 14, Presentation of Data: Quantitative and Qualitative.

In the above table, it is seen that in the opinion of more than half of the forward caste members, the PR officials respond promptly to their suggestions. About half the OBCs say that the PR officials respond after some delay. More than two thirds of the SC/ST members say that the PR officials are indifferent. This is may be due to the forward caste dominance of the DP officials.

Hypothesis 2: The higher the level of education, the higher the level of interest in politics. (see Table 5.)

Table 5
Interest in politics by the levels of education
(in percentages)

Levels of interest	Levels of education of the respondents			Total % (N)
	Some primary	Some secondary	Secondary +	
Somewhat	51%	11%	0%	26%
Good deal	49%	0%	0%	19%
Very much	0%	89%	100%	57%
Total%	100%	100%	100%	100%
Total (N)	(39)	(44)	(19)	(102)

Source: Hypothetical

It is obvious from the trend in Table 5, as the educational level of the women members of DPs increases, interest in politics also increases.

Hypothesis 3: The forward caste members are more likely to be interested in educational matters than the members of the other caste groups, who are likely to be interested in water supply and sanitation. (See Table 6)

Table 6
Area of PR interest by the caste categories
(in percentages)

Area most interested in	Caste of the respondents			Total % (N)
	Forward +	OBC	SC/ST	
School	63%	21%	39%	35%
Water Supply	32	36	27	31
Sanitation	5	43	36	33
Total%	100%	100%	100%	100%
Total (N)	(19)	(44)	(39)	(102)

Source: Hypothetical

Table 6 reveals no clear trend. On the whole, the total sample of the respondents is divided almost equally among the three administrative areas. But the women members belonging to the forward castes are certainly more interested in education. Probably because, their sanitation and water supply needs are taken care of. More OBC members are interested in sanitation and also water supply. The women members of the SC/ST category are almost equally divided among the three areas.

Hypothesis 4. The more the interest in politics, the more the women members are likely to expect prompt response from the DP officials. (See Table 7)

Table 7
How PR officials respond by women members' interest in politics
(in percentages)

How officials respond	Interest in Politics			Total % Total (N)
	Somewhat	Good deal	Very much	
Indifferent	68%	79%	14%	39%
Some delay	16	21	43	32
Promptly	16	0	43	28
Total %	100%	100%	100%	100%
Total (N)	(25)	(19)	(58)	(102)

Source: Hypothetical

It is found from Table 7 that in the opinion of more than one-third of the respondents, the PR officials are indifferent to their suggestions. About one-third feel that there is some delay in responding to their suggestions. Only about less than one-third feel that officials respond promptly. As compared with this overall trend, as many as more than

two thirds (i.e. about 68 per cent) of the women members who are only somewhat interested in politics feel neglected by the officials. At the other extreme, about more than two-fifth of those who are very much interested in politics feel that their suggestions are responded to promptly, or there is some delay. Interest in politics leads to intensive discussions of various issues with other politicians, voters, and other elected members. It increases the women members' confidence to argue with the PR officials. Therefore, interest in politics is of great importance to get work done from them.

13.6 ORGANISING THE FINDINGS OF A CASE STUDY

The case studies used to be once considered a pre-scientific or non-scientific design intended only to generate further hypotheses. That was when the survey design had become a preeminent design. But, in the recent years, the case study design has re-emerged as the only design capable of handling complex research problems. For example, a village emerging as an ideal village, free from factions and casteism, with enlightened, progressive and united leadership, etc. can be studied only as a case study. A case study design is not confined to any one source of data. It is a holistic study in its entirety, including the history of a case. It uses surveys, description of incidents, observation, participation in meetings, etc. The problems like the emergence, spread and prevalence of the Maoist movements; eruption of violence and its disappearance in the Punjab; sudden rise of the Bahujan Samaj Party; rise and success of an entrepreneur like Karsanbhai Patel (of the Nirma detergent powder fame), are all amenable to *only* case studies.

For example, the case study of NIRMA and Karsanbhai Patel will involve collection and analysis of many types of data. In the first place, by approaching in a city like Mumbai the wholesalers and retailers, you will find out about the preferences of the housewives about detergents produced by big giants like Hindustan Lever and Procter and Gamble. You will also inquire with the retailers and the housewives how the detergent, "*Point*," produced by a company specialising only in soaps, i.e., Karnataka Soaps and Detergents Factory (of the Mysore Sandal Soap fame) failed soon after its launch. You will conduct an in depth interview with Karsanbhai Patel about how he estimated a share in the market for his new detergent in the already overcrowded and over-advertised market of the detergents; how he assembled his finances; whom he expected to be his potential consumers, and how he began selling. You will conduct a survey of a cross-section of the housewives, who tried NIRMA and stuck to it; and, who tried NIRMA, but went back to their earlier brands. You will also conduct a survey of the retail merchants. Then you will creatively weave all these different types of data, organise them aspect by aspect and present them.

Similarly, the research findings of an ideal village, based on a social anthropological study will be organised and presented: how the leadership is united; how they ensure that the disputes between two factions or two leading families are amicably settled; how they take to task the lazy or corrupt officials; how they take the lead in getting the government schemes approved and implemented; and how they keep an eye on the village school, etc.

13.7 SUMMARY

Organising research finding requires great skill and imagination and, more than anything else, practice. You should begin by reading good research articles involving different

research designs published in the learned journals. Hence any attempt to organise the 'research findings' of any research project without any elementary introductions of what the research questions and objectives were; how a particular research design (viz. case study, survey, etc.) was necessary; how the data were (quantitative or qualitative) analysed, will not be understood by the readers.

13.8 TERMINAL QUESTIONS

1. What do you understand by the 'statement of the problem'? How relevant is it to research findings?
2. Examine the process of analysis and interpreting the research findings.
3. What is a hypothesis? How is the testing of hypotheses done?
4. Briefly examine the method of organising the research findings.

SUGGESTED READINGS

Denzin, Norman K, and Yvonne S. Lincoln., (eds), *Strategies of Qualitative Inquiry*, Thousand Oaks, CA: Sage Publications, 1998.

Greenbaum, Thomas L., *The Handbook for Focus Group Research*, (second edition). Sage Publications, London, 1998.

Rosenberg, Morris., *The Logic of Survey Analysis*, Basic Books, New York, 1968.

Shah, Vimal., *Reporting Research*, Agricultural Development Council, New York, 1977

Srinivas, M. N, et.al., (ed.), *The Fieldworker and the Field*, Oxford University Press, Bombay.

UNIT 14 PRESENTATION OF DATA: QUANTITATIVE AND QUALITATIVE

Structure

14.1 Introduction

Aims and Objectives

14.2 Quantitative Data

14.3 Principles of Table Construction

14.4 Qualitative Data

14.5 Modes of Analysis of Qualitative Data and Presentation

14.6 Summary

14.7 Terminal Questions

Suggested Readings

14.1 INTRODUCTION

You begin your research with research questions like, “How many students in this school pass the school leaving examination and in which classes / divisions?” “How have passing girl students done compared with the passing boy students?” “Has the educational levels of the Scheduled Castes increased since the last census?” “How is it this village has no factions unlike the other village?” And so on. These questions are then converted into hypotheses with variables. Gender of a student is a variable; male and female are the values or the variates. Marks in an examination constitute a variable; and the marks of an individual student constitutes a value or a variate. Unity in a village is a variable, faction-ridden or not is a value or a variate. You operationalise the variables. That is, you spell out the variable in observable, ascertainable terms. Then you collect the data. You adopt an appropriate research design: survey, observation, aggregate data, etc. You may develop an interview schedule, or data recording sheet. Or, you adopt observation, or social anthropological approach. After processing the data, i.e., making them amenable for data analysis (entering the data, coding), you analyse the data.

Aims and Objectives

This Unit would enable you to understand

- The methods of presentation of data
- As to how the data is generated and collected
- The qualitative and quantitative methods of presenting the data.

14.2 QUANTITATIVE DATA

You collect quantitative data from surveys, census, field experimental designs, etc. They pertain a uniform sets of units analysis. These units may be: voter 1, voter 2, ...voter n ; or they may be student 1, student 2, student... n ; or they may be district 1, district 2, district... n . The data or the characteristics of the units are either *continuous* or *discrete* variables. As Shah says (1977, p.16) “A continuous variable has an unlimited

number of possible values ranging from the lowest to the highest”. For example, age: a person’s age can be stated in terms of the number of years completed since birth; or years and months; or years, months and days. Time spent on studies per day can be stated in terms of hours, or hours and minutes, and so on. Weight, temperature, height of a building, length of a road, marks of a student, land holding in acres are the additional examples of continuous variable. Shah (ibid, p.18) says that the values of a discrete variable pertain to a single unit and the variable defines itself. For example, gender is variable: boys and girls are the complete wholes, and there are no points or gradations in between. Type of school is a discrete variable, contains the wholes of private, aided and municipal schools. There are no unlimited gradations between private and municipal. But the discrete variables are countable, student 1, student 2,... student n . The number of motor cars produced by companies is a variable and companies are the units of analysis. A car is a whole and there is no such thing as 1.78 cars. They are as much quantitative as the continuous variables.

Many times you have to use qualitative attributes to describe a person, an argument, meeting, a village atmosphere. For example, you will say ‘a person is liberal, or conservative’. ‘A village is free from factions or faction ridden’. ‘The talks between the foreign ministers of India and Pakistan were useful or not useful’. ‘A marriage is happy or unhappy’. They are the values of a variable, but the values are in terms of qualitative attributes. It is possible to derive a score of a person’s liberalism. But the variable can also be used in qualitative analysis, which is discussed below. **You have to analyse the data before you present the analysis. Presentation of raw data does not make any sense.**

Sources of Quantitative Data

Quantitative data can be obtained in two ways: surveys, experimentations and available sources. Even when you conduct a survey, say, of political participation, you will be asking the respondents, about their age, income, time spent on watching the news, etc. Or the quantitative data can be taken from the available sources like the census: number of families in a district living *kuchcha* houses; number of persons belonging to the Scheduled Castes or Tribes; number of educated women seeking jobs; distance in kilometers from the source of drinking water, etc. Similarly, you can obtain the data like length of roads, area under irrigation, etc. from the annual Statistical Handbook of India. The incomes and expenditures of the Indian states -budgeted, revised, and finally audited- are available, for every financial year in the *Bulletins* of the Reserve Bank of India.

A simple level of analysis of quantitative data (and its presentation) is to give the summary analysis: average (mean) marks of students passing the Secondary School Certificate (SSC) examination, and their standard deviation (a measure of dispersion or range); proportion of boys to girls in a school; proportion of SSC passing students in private schools to those in municipal schools; average attendance of students per month; loss of man days lost due to illness in a factory per year as a percentage total man days; irrigated land as a proportion of total cultivable land, etc.. Such presentation of analysis will not reveal much. If the lowest and the highest total marks of the students in the SSC examination are 30 to 80, and if I say that the average is 54.97 marks, it does not mean much to you. You would be interested in the number and the percentages of the students just passing, with second class, with first class, and with distinction. For that you have to arrange the marks of each student in an ascending series of conventional class categories: 30per cent to 49per cent pass class, 50per cent to 59per cent second class, 60per cent to 69per cent first class, 70per cent+ distinction. Although derived from a

continuous variable, the class categories constitute a discrete variable. You then take a frequency distribution using the Statistical Package for Social Sciences (SPSS) or some other software.

The above class categories of marks were derived from the accepted and established classifications in some school boards. But a problem arises when there are no such accepted systems of categorisation. Suppose you want to devise the class categories for family income in rupees for month. Imagine that the range in your sample is lowest Rs. 3000/- pm to highest Rs.60,000 pm. How to devise the class interval categories of poor, middle class and rich? There are no accepted standards. You may have to see the distribution in line graph, i.e. normal distribution, and find out the appropriate breaks and divide the respondents into the poor, middle and rich categories. Or, you should see the empirical research works of scholars in your field, and adapt from their classification. But, devise the categories in such a way that no cell is blank, or has very few units.

Tables and Charts

Imagine you have a sample of 110 students, who have passed the SSC examination; you have collected data regarding total SSC marks of each; the gender of the students- male, female; the type of school they attended - private or municipal. You have grouped the marks into class intervals of pass class, second class, first class and distinction. You now want to construct the tables. Generally, all tables in social research reports are cast in the format given the model Table 1.

The stub part contains, in this case, the divisions or the class categories. The box head contains, in the case of univariate tables (described below) only the frequency, percent, etc. In the case of cross tabulations, the values of, say gender, i.e. male or female. The “field” contains the data, i.e the percentage frequencies pertaining to the categories shown in the box head.

Table No.1 Example

Title of the Table

Stub	Box head
	Field

Source: Vimal Shah, *Reporting Research*, New York: Agricultural Development Council, 1977, p.27.

(a) Univariate Tables

The SPSS generated univariate frequency distribution tables, give the raw frequencies, percent frequencies, valid percent frequencies, and cumulative percentage frequencies.

(The column valid percent accounts for any missing value. An example is given below in Table 2.)

Table 2
Classes/Divisions of the Students

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Pass Class	24	21.8	21.8	21.8
Second Class	54	49.1	49.1	70.9
First Class	20	18.2	18.2	89.1
Distinction	12	10.9	10.9	100.0
Total	110	100.0	100.0	

Source: Hypothetical

In the presentations of ordinary univariate tables you do **not** need: valid percent, cumulative percent, and also the raw frequencies. **A fundamental rule of table construction is: never overload a table.** A reader should be able to make sense of the table unaided by you. So the above table has to be recast in a simplified way, as in Table 2.

Table 3
SSC passing students by their classes/divisions
(in percentages)¹

Passing category	Percentage (%)
Pass	22
Second class	49
First class	18
Distinction	11
Total % (N)	100% (110)

Source: Hypothetical

¹Note: The percentages in this and the subsequent tables may not always add up to 100% , because of rounding.

A learned reader is not interested in your raw frequencies. He is only interested in total number of students passing the SSC examination (here N=110), and what proportions or percentages of these students got which class. If you tell him 24 out of 110 obtained only a pass class, but 54 got second class, he will not quickly understand. Hence, the importance of percentaging or norming. Also, note that in Table 3 the percentages have been rounded off to last integer. **In social research it is not necessary to give decimals. Hence, you should always add a note that the percentage frequencies may not always add up to hundred, because of rounding.** In social research, we are not dealing with measurement in microns. Too much precision in measurement in social research is neither required nor desirable. Below the title of a percentage frequency distribution table always, mention “(in percentages)”. When a reader looks at the above table, he will come to conclusion that almost half of the passing students have obtained a second class. The above table can also be graphically presented, as in Chart1.

Chart 1
Percentages of students by their classes
(in percentages)



The charts are meant for quick visual grasping.

(b) Bivariate Tables

Table 3 cannot answer the question: how the boy students have done in comparison with the girl students. Here, gender is the independent variable, and classes or the grades constitute the dependent variable. Gender may affect the classes; but classes or grades do not affect the gender of a student. Hence a bivariate (cross tabulation between two variables) table has to be prepared. Rather than give the entire SPSS output table first and then a simplified version, the simplified table is given in Table 4.

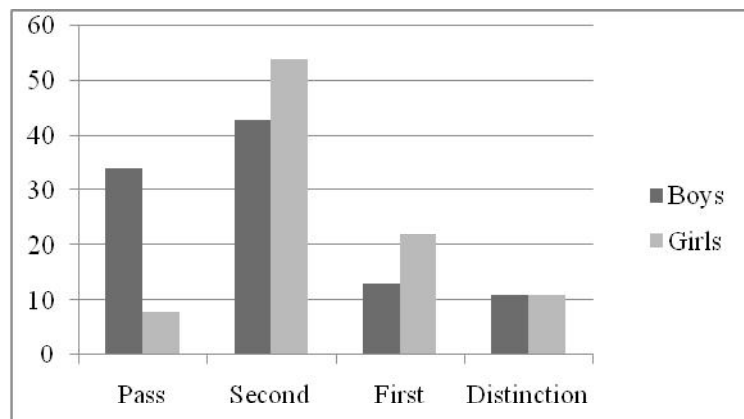
The reader will try on his own to ascertain the trend of the table. After having ascertained the trend, he will go to your text to learn about your interpretation. A good deal of interpretation can be obtained from the above table. The percentage total (%) symbols are at the bottom row of the table. Hence you should conclude that the variables in the columns are being compared with each other.

Table 4
Classes / divisions of the students by the gender of passed students
(in percentages)

Class /Division	Gender		Total %
	Boys	Girls	
Pass Class	34%	13%	22%
Second Class	43	54	49
First Class	13	22	18
Distinction	11	11	11
Total %	100%	100%	100%
Total (N)	(47)	(63)	(110)

Source: Hypothetical

Chart 3
Classes/Divisions of the passing students by their classes / divisions
 (in percentages)



Generally, but not always, it is a convention to place the values independent variable (in Table 4 it is the gender: boys and girls) in the columns. In Table 4: the boy students are being compared with the girl students in terms of the classes or divisions. **The first thing is to look at the marginals or the total column (i.e. the last column).** Here you will see that out of 110 passing students, less than one fourth (i.e. 22per cent) have passed with only a pass class. **This is called the sample norm (in each of the cells of this particular column).** But, as many as one-third of the boys as against the sample norm of only less than one-fourth, and about slightly more than one -tenth (13 per cent) of the girls are in the pass class. Similarly, higher percentages of girls are found in the second class and in the first class. Only at the distinction level the percentages of the boys and girls are similar to the sample norm. While in the sample, there are equal proportions of very bright boys and girls (distinction), at the lower levels the girls always did better than the boys. This could be due to the fact that girls, generally, have fewer distractions than the boys. **In order see if there is a trend, you compare the percentage in a cell in the Total Column, with the percentages in the cells of the corresponding row (i.e., parallel). If the percentages in the corresponding cells in the parallel row vary much from the sample norm, there is a trend.**

Table 5 gives another example of a bivariate table. If you ask the question: ignoring the gender, the students of which type of schools- municipal or private- have done better in the SSC examinations, this will lead to a bivariate cross-tabulation between the two variables – school type - the independent variable - and classes/ divisions of the students.

Table 5
Classes / divisions of the passing SSC divisions by the Type of Schools
(in percentages)

Class /Division	Type of School		Total %
	Municipal	Private	
Pass Class	35%	13%	22%
Second Class	52	47	49
First Class	9	25	18
Distinction	4	16	11
Total %	100%	100%	100%
Total (N)	(46)	(64)	(110)

Source: Hypothetical

While interpreting Table 5, you will first examine the bottom row. The percentage totals of 100 per cent at the bottom of columns of school types and totals (N) indicate that the categories in the columns, - in this case the passing students of two different types of schools and the totals – indicate that the categories of schools two different schools – are being compared. Then you examine the pattern of classes or divisions in the last column. You will find that out of total 110 students, 22 per cent have obtained only a pass class, 49 per cent second class, 18 percent first class, 11 per cent distinction. Then you compare these values in the cells with the values in the cells across the rows. In the distinction category, you find that whereas 16 per cent of the students of the private schools and only 4 per cent in the municipal schools against the sample norm only 11 per cent have obtained the distinction. Overall, 18 per cent obtained the first class; 25 percent in the private schools as compared with only 9 per cent in the municipal schools obtained first class. The trend clearly shows that the students of the private schools do much better in the SSC examinations. **But you have to go beyond ascertaining the trend.** You have to explain it. One of the obvious explanations is that teachers and teaching in the private schools are much superior to those in the municipal schools. The students in the private schools are more likely to come from better educated families, and also have higher aspirations for their children. Also, the peer group pressures and competitiveness are high in the private schools.

(c) Three way Tables

After examining the Tables 4 and 5, you will argue that the better results of boys and girls have got mixed up with those of better results due to types of the schools. You would like to separate or partial out, the gender effect from the school effect. Then you will construct a three way table on the model shown Table 6.

Table 6
Classes / divisions of the students by type of schools and by gender
 (in percentages)

Classes/Divisions	Municipal		Sub- Total	Private		Sub- Total	Total
	Gender			Gender			
	Boys	Girls		Boys	Girls		
Pass	46%	17%	35%	16%	11%	13%	22%
Second	43	67	52	42	49	47	49
First	8	11	9	21	27	25	18
Distinction	4	6	4	21	13	16	11
Total % (N)	100% (28)	100% (18)	100% (46)	100% (19)	100% (45)	100% (64)	100% (110)

Source: Hypothetical

If you look at only the last column of Table 6, it is an extract of the Total Percentage columns of Tables 3 to 5. If you look at the two columns of the sub-totals of the municipal and private, the two subtotals are the replica of the columns municipal and private schools of Table 5. In the municipal schools, the percentage of the boys obtaining just a pass class is more than twice the percentage of the girls obtaining just a pass class (That is not a great achievement on the part of the boys). In the second class and in the first categories, the percentages of the girls are far above those of the boys, more so in the municipal schools. In the private schools, as far as the distinction category is concerned, the boys are likely to do much better than the girls. The sum and substance of the above analysis is that whatever the school type, the girls perform much better than the boys, excepting in the distinction category in the private schools: here the boys perform better than girls. These boys could be highly career minded.

Beyond a three way table, four way tables or five way tables become so complex that you cannot interpret them. Even a three way table requires a large sample size. The requirement of sample size increases with the number of cells in a table.

14.3 PRINCIPLES OF TABLE CONSTRUCTION

From the above examples of univariate, bivariate and three way tables the following principles of constructing a table or presentation of quantitative data emerge.

- In social research, the quantitative data have to be summarised and presented. You could have given the individual marks for each boy student and each girl student, as for example Boy student No1 = 50% marks, Boy student No 2= 48 marks, till the student No. 110. This would not have made any sense to the reader, as it would not have revealed any pattern. Quantitative social science research or data analysis is all about seeking to find patterns or trends. Hence the total marks have to be regrouped into the accepted categories of pass, second, first classes, and distinction. In your research, you may have to similarly develop categories of age, income, expenditure, educational level, etc.

- Quantitative data have to be presented only in the form of tables of percentages, with total raw frequencies appropriately placed.
- When you construct a univariate or bivariate or a three way table, do not overload the table with raw frequencies, both row percentages and column percentages and cell-wise percentages.
- Whether percentaging should be done cell-wise, column-wise or row-wise is not matter of taste. There are certain rules about it.
- If you are comparing the values (like boys vs. girls) of the **independent** variable of gender, or the values (like attending municipal vs private school) of the **independent** variable of school type, then it is desirable to place boys/ girls, or municipal/ private in the columns, and draw the percentages column wise.
- Insert '100 per cent' and the corresponding (N) in the last row, at the bottom of each column, so that the reader will have no doubt how the percentages have been drawn and which values of the independent variables are being compared. The percentages in the cells of the last column are compared with the percentages in the cells of the corresponding row. If they differ in a big way, there is bound to be a pattern.
- The reader himself will study a table and ascertain the trend. He will then go to your text to find out your interpretation of the trend.
- Do not repeat in your text, the same percentages as in the table. Do not say, "Whereas 22 per cent of the overall students obtained a pass class, only 13 percent of the girls as compared with the 34 percent of the boys did so." It will not interest the reader. Write, "Whereas a little less than *one-fourth* of the passing students got the pass class, only a little more than *one-tenth* of the girls, compared with about one-fourth of the boys got the pass class". Do not use the symbol per cent in the text.
- If you have constructed or reworked your table from a source of secondary data (i.e. the data collected by somebody else, usually a government authority, like the *Census of India*, or the *Bulletins* of the Reserve Bank of India), you must mention just at the bottom of the table the source, volume, and pages. Follow the rules regarding the citations.
- If you have rounded off the decimals, mention at the bottom of the very first table: "The percentage frequencies in this table and the subsequent tables do not always add up to 100 because of rounding."
- If you have, for example, combined the votes polled by the unrecognised parties and independents into "others", give a superscript like "others¹" within the table. Then at the bottom of the table, type superscript ¹, and then explain what this word "others" means.
- The title of the table itself should clearly show which variables are involved and the direction of comparison. For example, the title of Table 3, "SSC passing students by their classes/divisions", shows that in this univariate table, the SSC passing students are the units of analysis and their classes or divisions constitute the variable. The title of Table 4, "Classes divisions of the students by the gender of passed students",

clearly shows that the proposition ‘by’ separates the dependent variable of classes from the independent variable of gender and the male and female students are compared with each other in terms of their classes.

14.4 QUALITATIVE DATA

As seen above some data are countable, and some are scalable in terms of continuous variable, which can be made discrete. In either case they can be analysed in terms of a univariate, bivariate, and three way tables. i.e. analysis of quantitative data. (At the M. Phil. level you will learn about more sophisticated analyses of quantitative data). The computer revolution, along with advances in statistical techniques of analysis, has given a big boost to analysis of quantitative data. Many research students have started only taking such research projects which would involve collection of survey/quantitative data and their analysis. This led to the neglect of the collection and analysis of qualitative data.

The Nature of Qualitative Data

There are items or information in verbal forms, which have theoretical significance in all branches of social sciences. In the recent decades, generally social and cultural anthropologists use and employ analysis of qualitative data much more. These days even empirical political science and sociology are turning to it. Qualitative data also pertain to the units of analyses: villages, individuals, social movements, *panchayats*, groups – natural or *ad hoc* assembled, like specially called focus groups. They are in the form of factual statements, E.g.,

- The women members of *panchayat A* are more *enthusiastically and emotionally involved* in their work than those of *panchayat B*.
- There *are no factions* in this village, as compared with the other.
- Tata Institute of Social Sciences offers *unconventional types of M A programmes*.
- IGNOU and JNU have *liberal ethos*.
- After the irrigation came to this village, the rich *do not take part in the community activities*.
- The consumer resistance to the rise in onion prices *is low*.
- The transfer power in Tunisia was *sudden*, but *peaceful*; that of in Egypt was *prolonged* but *peaceful*.

These are some of the examples of qualitative statements, where no numerals or scale values are attached. The *italicized* phrases may constitute descriptions, but are actually values, the variates of a variable. “This village vs that Village”, “Tunisia vs Egypt” etc. are actually the units of analysis.

Widely used earlier

Before the emergence of analysis of quantitative data, almost all scholars described, analysed and explained using qualitative data. For example, the French scholar, Alexis deTocqueville travelled throughout America in the 1830’s. He listened to people, attended their meetings, observed consensus and differences. He then wrote *Democracy in America* (published in 1935). For his subsequent work on the French Revolution, he

studied all the available documents and even some statistics pertaining to the years before the French Revolution, and wrote *Old Regime and the Revolution* (1856). Both the books are relevant even today. They continue to inspire the scholars today, and many innovative theories. W. Ivor Jennings wrote (British) *Parliament* (1939) and *Cabinet Government* (1965). Both are classic tomes, devoid of any statistical analyses, but full of not merely insights but explanations. He relied on the debates in the Parliament, published cabinet papers, interviews with members of the parliament, ministers, opposition leaders, etc. Also, these works are, unlike the recent studies, based on surveys or aggregate data bases, not only educative but also eminently readable.

How are the Data Generated and Collected

As in the case of collection and analyses of quantitative data, the researcher has to equip himself with research questions and a theoretical framework. There is no substitute.

- a. The researcher can observe village festivals, who participate more or less enthusiastically, whether political rivalries are present, who takes the leadership, and so on.
- b. As a social anthropologist does, a researcher stays with a community for a fairly long time, becomes a complete part of it, participates in most of their activities, observes and records.
- c. He carefully studies the newspapers, novels, biographies, autobiographies, of the period of his interest, say early twentieth century and constructs an account of, for example, the non-Brahmin movement in Maharashtra or Karnataka.
- d. Many surveys contain some open ended questions: “What are the root causes of corruption in India?” “How can corruption be eradicated?” “What is your opinion about the Vigilance Commission?” etc. There will be multiple unstructured responses. Like, in regard to the root causes of corruption: 1. “Indians lack civic sense”. 2. “Most Indians want to get their work done as fast as possible”. 3. “Only a Gandhi, or Shri Anna Hazare can resist corruption”. 4. “If I do not bribe, I will be dead before I get my ration card”. 5. “I am too weak to fight against the government authorities.” 6. “Everybody is corrupt from the ministers to the lowest peon or the village accountant.”
- e. Sometimes interviews / discussions are conducted with key informants with the help of an interview guide. This interview guide may contain 15 to 20 very general questions. The respondents are requested to dwell on each question as long as they want to, and say whatever they think. You return home and write out the responses from the memory.
- f. One of the most important methods used to generate data today is focus on group meetings. Eight or nine persons are invited to discuss an important topic like “non-violence today”. In the beginning there will be many diverging view points. As the interaction among the participants increases, the differences may get narrowed down, finally two or three major opinions may emerge.

14.5 MODES OF ANALYSIS OF QUALITATIVE DATA AND PRESENTATION

a. Content analysis

Many times scholars take a text, count the number of theoretically relevant words, or

phrases. If your hypothesis is: All India nationalism emerged first, then the regionalism, you take issues of ten years in the 1920's of an important Kannada or Marathi language daily newspaper or a political weekly. You then count the words meaning or signifying "We Indians," and "We Kannadigas" "We Maharashtrians". If you find that the references to the former, i.e. "We Indians," are slowly growing and the references to the latter growing steeply, then you conclude that regionalism is growing faster. These days you get sophisticated computer software to perform content analysis.

b. Quantitative analysis of multiple responses.

A standard stimulus questionnaire or interview schedule may contain open ended questions, eliciting multiple responses. In the paragraph 8 (d) above, the responses have been numbered 1 to 6. Respondent A might give responses no. 1 and 3 only; respondent B may give responses 2 and 4; respondent C may give responses 4, 5 and 6. You will have to make list of single open responses. Each will be coded, entered into a column each of SPSS data view. And the frequencies of the respondents for each group of (multiple) responses are taken. The groups of multiple responses can even be cross tabulated with other variables like age, gender, religion, etc. The SPSS provides for analysis of multiple responses.

Strictly speaking, the content analysis and analysis of multiple responses do not qualify as qualitative analysis. You may call them analysis of qualitative data.

c. Thick descriptions

After observing the village factions, the author gives a 'thick' and rich descriptions of the causes, background of the factions' leaders and their followers; political link up with *taluka* level factions; intrusion of factions in to the sugar or other cooperatives, etc. The 'thick' description contains the roots of factions, their causes, their deepening, their expansion, may be their replacement by other factions, etc.

d. Crude classifications

Take for example the qualitative data, regarding factions in villages, or the origin and development of backward class movements. You can examine them and crudely classify them along the lines of: year of origin, intensity, development in terms of the following, sub factions, achievements, decline, if any. Mere description of these differences is enough at the M.A. stage.

e. Semantic interpretation

This kind of interpretation does not fall within the scientific framework. But it has to be mentioned here, because, you should not get the impression that scientific interpretations constitute the only way of interpreting the qualitative data. The scholars of semantic interpretation 'deconstruct' how a person grew to acquire, say, the meaning of 'faction'.

14.6 SUMMARY

Analysis of social or political problems in terms of quantitative or scalable variables is a recent trend. The surveys got a big boost because of development in statistics, advances in attitudinal scaling and the computer revolution. All these facilitated survey design, data collection on a large scale and statistical analysis. Also, all governments conduct censuses, primarily devoted to births, family size, gender ratios, etc, also to ascertain availability of

drinking water, etc. Again the Government of India and the state governments maintain and update their records of length of roads, number of hospital beds, number of schools and their students, etc. All these data need appropriate analysis, and presentation of analysis. This lesson concentrates on presentation of analysis of quantitative data in simple univariate, bivariate, and three way tables. But there is no substitute for bivariate or three way tables. They do not compress reality as correlations, etc. We learn a lot more from a series of bivariate tables than, say from regressions. But, the table should not be congested, and the direction of percentaging should be very clear.

All said and done, even bivariate or three way tables do compress reality to a great extent. The quantitative data are hard, their analysis mechanical, their conclusions dull and drab. The qualitative data are soft, lively and interesting. It might be uninteresting to read a thesis with 30 to 40 tables. In each Indian language there are novelists who have portrayed, say the conditions of women, or village feuds, more realistically and more grippingly than even an accomplished survey researcher has done. Hence, the importance of collecting and analysing qualitative data, and presenting them. Strictly speaking, content analysis and multiple response analysis with suitable computer software programmes do not qualify as qualitative analysis. Hence, the importance of narration, thick description and social anthropological reports.

14.7 TERMINAL QUESTIONS

1. What is quantitative data? What are its sources?
2. Analyse the principles of table construction in research presentation.
3. What is qualitative data? How is it generated and collected?
4. What are the modes of presentation and analysis of qualitative data?

SUGGESTED READINGS

Denzin, Norman K, and Yvonne S. Lincoln., (eds), *Strategies of Qualitative Inquiry*, Thousand Oaks, CA: Sage Publications, 1998.

Greenbaum, Thomas L., *The Handbook for Focus Group Research* (second edition), Sage Publications, London, 1998.

Rosenberg, Morris., *The Logic of Survey Analysis*, Basic Books, New York, 1968

Shah, Vimal., *Reporting Research*, Agricultural Development Council, New York, 1977

Srinivas, M. N, et.al., (ed.), *The Fieldworker and the Field*, Oxford University Press, Bombay.

UNIT 15 SCIENTIFIC PRESENTATION (STYLE, CITATION, FOOTNOTES ETC)

Structure

15.1 Introduction

Aims and Objectives

15.2 Abbreviations

15.3 Table of Contents

15.4 Lists of Tables, Charts, Figures, Special Abbreviations and Glossary

15.5 Pagination and Chapters

15.6 References and Bibliography

15.7 Quotations

15.8 Style and Language

15.9 Summary

15.10 Terminal Questions

Suggested Readings

15.1 INTRODUCTION

Over the decades, a few conventions, formats and styles of presentations of social science research reports have evolved. A considerable degree of consensus over these conventions, etc. has also developed. This helps in the dissemination of knowledge, its proper understanding, appreciation and critique - across the continents and universities, and among the individual scholars, the various disciplines of social sciences. These conventions have become simpler, and reader and printer friendly. They do not impose any fascist/ or dictatorial regime, they actually facilitate discussion and argumentation and encourage further research.

Aims and Objectives

This Unit would enable you to understand

- The scientific presentation of data;
- As to what is meant by abbreviations and table of contents; and
- The style and language formats and other features.

15.2 ABBREVIATIONS

General

In the report of your research, you will be using many internationally accepted abbreviations, generally derived from Latin (L). Since this essay will also be using some of these in the

following sections, it is necessary to explain and illustrate these methods first.

- *cf.* (Latin short form for *confer*; compare). You write, “For example, Sirsikar (1973) defines political participation as... (*cf.* Kothari, 1969; Sheth, 1975)...”

(This is the Harvard format of references, which will be discussed below, along with the Vancouver format. The references are used to support your argument, or indicate your differences with others. Also, the references direct the reader, if interested in the subject, to go to the books that have been cited in the brackets. Most research students take down the relevant references for further study. This explanation is also an example of a footnote or an end note. Note the superscript in the text as well as at the beginning of this footnote).

This means, compare the definition of political participation of Sirsikar with those of Kothari and Sheth.

- *e.g.* (L. *exempli gratia*, for example). “The regional political parties, *e.g.* Akali Dal, Shiv Sena, and Telugu Desam...” This means there are other regional parties.
- *et al.* (L. *et alia*, and other people and things). “Studies of singles cases, *e.g.* Mehta (1971), Somjee (1971) show...” There are others who have done studies of single cases on this topic.
- *etc.* (L. *et cetera*, “there are other things you could have mentioned”), as in “The communal violence outbreaks as in Ranchi, Godhra, etc....”
- *f.* or *ff.* (L. plural, and following) as in , “According to Delaney(2005:70), among the conflict theorists there is no full consensus in any society; the society’s norms favour the powerful.” “He further argues (*Ibid.*: 71 *ff.*)...” This means ‘in the pages following p.71’.
- *Ibid.* (L. *ibidem*, “in the same book or the piece of writing that has just been cited above.” E.g. Kothari (1996:16) argues that the rural areas are being drained of the resource bases. He further suggests (*Ibid.*), “Finally, there is the problem of erosion of values.”
- *i.e.* (L. *id est*, “That is”) “The Communal Government Order of 1921 of Madras, *i.e.*, the scheme of caste wise and religion wise reservations...”
- *inf.* (L. *infra*, see the following pages.)
- *N. B.* (L *nota bene*) Note carefully.
- *op. cit.* “In the book or article already referred to just above.” This abbreviation is different from *Ibid.* The latter is used when you reference an author’s book or article in an immediately following reference. *Op.cit* is used to reference a book or article, the author which has been cited not in the just preceding article or book, but many references earlier.
- *sic* “Exactly as in the quotation from another author, including the mistake.” “President John Kennedy (*sic*)...”
- *supra*, See above. “Most of the rules of admission discussed *supra* the need of revisiting.”

- viz.(*L. videlicet*,) namely, “The first two prime ministers of India, viz. Nehru and Shastri.”
- www World Wide Web

Abbreviations for frequently used terms

AIADMK All India Anna Dravida Munnetra Kazhagam

BJD Biju Janata Dal

BPL Below the Poverty Line

NCP Nationalist Congress Party

SAD Shiromani Akali Dal

After your preface come your Table of Contents, list of Tables and Charts. After these, you create a new section, “Abbreviations” and put in it the abbreviations of frequently used terms, like those given above. This avoids in the text the repetitions of full and space consuming forms of the phrases like the above. Even the name of the late Chief Minister of Andhra Pradesh, Y. S. Rajashekhara Reddy has been reduced to ‘YSR’ in some learned articles.

Other abbreviations

In your writing, you may have to refer to the United Nations (UN), Indira Gandhi National Open University (IGNOU), University Grants Commission (UGC) etc. These are well known and familiar terms. You need to mention the full form the first time you use them in the text along with the abbreviation in brackets. Thereafter you can use only the abbreviations. E.g., “The University Grants Commission (UGC) has framed new guidelines regarding Ph. D. admissions. The UCC has decided that ...”

Title of your thesis

Do not give a long title for your thesis. Preferably give a subtitle. This will help the reader to focus better on your thesis. E.g., “Changing Rural Power Structure in Karnataka: A Study of Two Villages”. Again, For example, the main title of a famous book (Skocpol, 1979) as it appears on the cover page is *States and Social Revolutions*. But the inside title page contains the following subtitle also: *A Comparative Analysis of France, Russia and China*.

Preface

You briefly state the importance of your research topic, and how you developed interest in it. You should justify, citing the absence of such works, the need for such a work. You should acknowledge the help you received from others, particularly your ‘significant one’. You should acknowledge the advice and guidance of your supervisor, but do not praise him/ her superlatively. Also thank your typist and the friends who would have helped you in many ways. You may include other acknowledgement here, or make a special section.

15.3 TABLE OF CONTENTS

(a) Some scholars prefer to give in the table of contents only the titles of the chapters and corresponding page number where the chapter starts, e.g. (Rosenberg, 1968).

CHAPTER 1	The Meaning of Relationships	3
CHAPTER 2	Extraneous and Component Variables	23
CHAPTER 3	Intervening and Antecedent Variables	54

- (b) In the above format a reader is clueless regarding the contents of each chapter. The reader does not know what to expect in each chapter. Generally, only your thesis supervisor and the examiners of your thesis will read your thesis from cover to cover (they cannot help it). Others are generally interested in some particular sections of a chapter or some particular finding. Hence it is advisable to give in the table of contents, the titles of chapters, and the titles of its sections, e.g. (Delaney, 2008, p. iv)

1	Examining Social Theory	1
	Origins of Social theory	3
	Thomas Hobbes	4
	John Locke	5

The following is another example of the section-wise table of contents (Skocpol, 1979, p.vii).

1.	Explaining Social Revolutions: Alternatives to Existing Theories	3
	A Structural Perspective	14
	International and World-historical Contexts	19
	The Potential Autonomy of the State	24
	A Comparative Historical Method	33
	Why France, Russia and China?	40

- (c) In some complex treatises, the sections the chapters are numbered, using a variation of the decimal style. E. g. (Boyd, Jr. and Iverson, 1979, p.xiii)

Chapter 1	Introduction	
1.1	Explaining variation in an Individual- level variable with an individual level variable in a single subgroup	3
1.2	Explaining variation in an Individual- level variable with an individual level variable in a general population	4

This format helps in frequent cross references.

15.4 LISTS OF TABLES, CHARTS, FIGURES, SPECIAL ABBREVIATIONS AND GLOSSARY

These lists or tables with page number follow the table of contents. They should be numbered as 1.1, 1.2. and so on. The numeral before the decimal denotes the number of the chapter; and the numeral after the decimal denotes the serial number of the table, chart or figure. This means: table or chart or figure 1 or 2 in Chapter 1. After the Table

of charts and figures, list the abbreviations of space consuming and repeatedly occurring phrases names like AIADMK, as discussed in section 2 *supra*.

Then give a glossary: plain English translations of words or phrases used in the Indian languages. Examples are:

<i>Ahimsa</i>	Nonviolence
<i>Bundh</i>	A total strike or stoppage of work, usually enforced at the behest of a party, but on rare occasions spontaneous and voluntary
<i>Dharna</i>	A sit-in
<i>Morcha</i>	A political procession
<i>Satyagraha</i>	Literally, a total adherence to truth, but a kind of nonviolent sit-in

15.5 PAGINATION AND CHAPTERS

Pagination

The page numbers are generally placed on top left of the left hand page or the top right hand page of a thesis. This helps the reader in thumbing through the pages, and identifying the required page. The page numbers of the text are in Arabic numerals, e.g. 1, 2, etc. The page numbers of preface, table of contents, list of charts, or figures, and glossary are in Roman numerals, but in the lower case, e.g. i, ii, iii, iv (see Boyd, Jr., and Iverson, op.cit). There is a convention that the pages on which preface, table of contents, etc. and a new chapter commence do not carry any page numbers, but the pages are taken into account.

Chapter Scheme

In the Chapter 1, “Introduction”, you are required to justify why you chose a particular problem for your research. Selecting a problem area and formulating a research problem constitute an intellectually demanding and often torturous process. It involves a progress of two steps forward, one step backward. Critically discuss the relevant literature you have examined in your problem area, **identify the gaps in the knowledge and derive the research questions and objectives**. It is not desirable to include everything and anything that is even tangentially related to your problem area. These days it has become a fashion to call the introductory chapter just “Review of Literature”, put any related work into it.

In a thesis reviews of literature should come in three places: (a) In the introductory chapter, where you identify the gaps in knowledge. And justify your choice of a particular problem for research. (b) More importantly, an extensive review of literature comes in your chapter on the theoretical framework. In social science research (except to some extent in economics) readymade and canned theories are not available for the purposes of your research. You have to construct your own theory. And, (c) another review of literature (pertaining to research methodology) comes in the chapter or section on methodology, where you demonstrate how you are improving on the methodologies of the others.

In Chapter 2 you will state and discuss your theoretical framework. Drawing upon the various findings and arguments of the leading scholars and also on your imagination, you construct a theory for the purposes of your objectives. You will also state and justify

your hypotheses. It is better to draw a flow chart showing the interconnections among the variables- independent, intervening and dependent (For the examples of flow charts, which simplify a theory, see Kerlinger [1995, pp.20-31]. At the M.A. stage it is sufficient to make the sections on the methodology a part of the chapter on theoretical framework. These sections on methodology would include: the operational definitions of major variables, their measurements, research design, principles of questionnaire/interview schedule construction, sampling, data processing, plans of analyses, etc. If you are adopting social anthropological approach, discuss the selection of the locality, its nature, composition, how the locality is suitable for your research problem, etc.

Chapters 3, 4, etc., should be devoted to the discussion of your findings. It is a convention to arrange the chapters by groups of the dependent variables, i.e., the parts of the phenomena to be explained. For example, if you have studied political participation in an area, design the chapters along (a) political awareness, giving attention to political news, etc.(b) political activism, attending meetings, distributing party literature etc. (c) voting, switches in party loyalty, etc.

The next chapter will deal with Conclusions. It will discuss how some your hypotheses were upheld fully and partially and how some could not be supported by the empirical data. You will also discuss your own contribution to the theory of, for example, political participation. You should suggest further areas of research.

Appendices

The concluding chapter will be followed by appendices. Invariably your interview schedule, questionnaire, interview guide, government circulars, etc. are placed in the appendices.

15.6 REFERENCES AND BIBLIOGRAPHY

a. The Vancouver format

In the Vancouver style, references to authors with the help of footnotes / end notes are separate from bibliography or the list of books referred to. In other words, the references to books, articles and their authors will be repeated in two places: references at the bottom of the page in the text, or the end of a chapter or chapter wise at the end of the thesis; and also in 'Bibliography' - a list of books and articles, each beginning with the authors' surnames and arranged alphabetically surname-wise, at the end of the thesis.

Suppose you are arguing, "Kothari's first major work¹ clearly shows how well the Indian democracy was working in the 1960's". Then you continue, "Kothari² further argues that the Indian opposition parties were effective, though they were numerically weak. About two decades or so later he changed his opinion about the working of democracy in India³". You insert a superscripts¹, ² and ³ at appropriate places in your sentences, and give the details in a footnote at the bottom of the page, or at the end of the chapter or at the end of the thesis with reference to the chapter. (Here, for the sake of illustration and convenience, the model footnotes referencing Kothari in the Vancouver format have been given just below).

⁽¹⁾ Rajni Kothari, *Politics in India*. Boston: Little, Brown and Company, 1969.

⁽²⁾ Ibid.

⁽³⁾ Rajni Kothari, "Decay of the Ethos of Development with Justice" in R K Hebsur, (Ed.) *Social Intervention with Justice*. Mumbai: Tata Institute of Social Sciences, 1995.

(Note that there is no inversion of names in the footnotes of the Vancouver format. But

the names have to be inverted in the bibliography, like Kothari, Rajni.)

Before the advent of the superscript facility, the authors used type in brackets, as Kothari (1), Kothari (2), Kothari (3) etc. As mentioned above, in the bibliography the author's name would be inverted as Kotahri, Rajni and placed in the alphabetical order. There is major difference between the List of References and Bibliography. A list of references confines itself to strictly those articles and books which have been referenced. A bibliography goes beyond these and includes all those books and articles which are relevant to your thesis (All the footnotes or end notes are given in smaller fonts. Here for the sake of easy readability, they are in the same font as the main text).

b. Harvard format of reference –cum – ‘bibliography’

The Vancouver format caused problems to the author, reader and typist. If, in one of your chapters, Skocpol was referred to twice, but consecutively, the footnote was typed simply *ibid*. If you quoted her again after quoting other authors, you would give a numeric superscript and type in the footnote corresponding to the numeral, op.cit. and give the relevant page number(s) of the book. If you cited more than one book of Skocpol, you had to give the first few words of the relevant book. Sometimes, in addition to a quotation by an author, or reference to an author, you may have to give an elaboration, make a remark or cite some tangentially related book. That too had to be given in the footnote or the endnote. Now, the Harvard format is used strictly for citation and reference, thus enabling you to use the footnotes or end notes for other purposes. For example, suppose you have referred in your thesis to the erstwhile rivalry between Ramakrishna Hegde and H D Deve Gowda of Karnataka, and you want to say something more about Hegde¹, which need not go into the text, here you can use the footnote (or endnote) as has been done at the bottom of this page.

The Harvard format removes many of these inconveniences. The reader will keep a book mark at the beginning of the references given at the end of a book or your thesis, and identify the authors and their works (See the citations *supra*, e.g. Skocpol, 1979). More importantly, the footnotes or endnotes can be used for some other purposes.

The Harvard style does away with the duplication of citing authors and their titles: once as a full citation as a footnote, and the second time as an entry in the bibliography at the end of the thesis. Page 1 of this Unit itself contains examples of the Harvard format. The format combines references with bibliography. As you have seen, only the surname of the author is mentioned followed by a comma, then the year of publication, followed by colon and page number. E.g., “It is useful to consider some of the different types of symmetrical, reciprocal and asymmetrical relationship appearing in research (Rosenberg, 1968:3).” In the list references, this would be listed in the alphabetical order as, “Rosenberg, Morris (1967) *The Logic of Survey Analysis*. New York: Basic Books. Another example of listing in the references is: Skocpol, Theda (1979) *States and Social Revolutions: A Comparative Analysis of France, Russia and China*, Cambridge: Cambridge University Press,

¹Hegde, a *shaivite* Brahmin from Uttara Kannada district, Karnataka, was elected as the district Congress president at a fairly young age. He carefully cultivated the Lingayat community in the central and northern Karnataka. The exit of Veerendra Patil from the Janata Party further consolidated his position as the major spokesman of the Lingayats. Also, because of his flair for Kannada literature, and his pure Kannada accents, he became an all- Karnataka leader.

15.7 QUOTATIONS

In the preceding discussions, many authors have been referred to, by way of examples, in the Harvard format of references. Various types of quotations in this format are listed below:

(a) Full quotation of a sentence or two from a single author

1. "One frequently encounters relationships in social research in which it is not immediately possible to specify which is the independent (causal) and which dependent (effect) variable, but in which the causal forces are none the less in operation" (Rosenberg, 1968:8). In the list of references it would be listed as: Rosenberg, Morris (1968) *The Logic of Survey Analysis*. New York: Basic Books.
2. Delaney (2008:199) argues, "Phenomenology is a micro-oriented sociological theory which has as its subject matter the conscious experience of individuals". In the list of references it would be listed as: Delaney, Tim (2008) *Contemporary Social Theory: Investigation and Application*, Delhi: Pearson Education.
3. Skocpol argues (1979:286), "We might be tempted to conclude that, in contrast to Lenin, Max Weber is a better and more infallible guide to revolutionary outcomes." In the list of references it would be listed as: Skocpol, Theda (1979) *States and Social Revolutions: A Comparative Analysis of France, Russia and China*, Cambridge: Cambridge University Press.
4. Hebsur (1985:348) argues, "A theory can be more fruitfully considered as an ingenious network of existing and available laws of generalisations, hypotheses and assumptions". In the list of references, it will be listed as Hebsur R. K. (1985) *Indian Journal of Social Work*, (Special issue on Research Methodology) Vol.46, No.3 (October) pp.347-358.
5. In the opinion of Phadke (1987:23), "Right from its inception, the Congress tried to attract the Muslims and the Congress leaders tried to refute the charge of its critics that it was basically a Hindu organisation, and not a truly national organisation". In the list of references it will be listed as Phadke, Y.D. (1987) "Congress before Gandhi," in Ram Joshi and R.K.Hebsur (Eds.) *Congress in Indian Politics: A Centenary Perspective*, Bombay: Popular Prakashan, pp.21-34. Another example is: Baxi, Upendra, (1996) "Judicial Discourse, the Dialectics of the Face and the Mask", in R K Hebsur, (Ed.) *Social Intervention for Justice*, Mumbai: Tata Institute of Social Sciences, pp.83-106.

N. B. Italicise only the titles of the books, journals and edited books. Also, note that the name is inverted, i.e. surname first, and then the first name. The year of the publication follows in brackets. The title of the book/journal is in italics. This is followed by the place of publication, and name of the publisher.

(b) A quotation with ellipsis (i.e. deliberate omission of some word) which makes the meaning clearer.

"The general availability of a vast pool of female labour...has led to low wages and

exploitative working conditions” (Karkal, 1996:239). Use the single author format for listing in the references.

(c) Long quotations.

If you want to quote many consecutive sentences containing an effective argument, make a separate paragraph, type in single space and indent (leave) ten spaces from the left (*i.e.* leave a wider margin) without any quotation marks. E.g. Analysing the nature of theories, Hebsur (1985:348) argues:

The explanatory power of a theory will depend on three factors: (a) to what extent the component of laws is well-established, (b) how strong is the interconnectedness, and (c) how plausible are the logical inferences. A theory containing weak generalisations, weakly joined, and vaguely suggesting hypotheses, is bound to be a weak one.

Use the single author format for references.

(d) Reference to two or more authors of a book or an article

In the text, you will write, Boyd and Iversen say (1979:2), “The first of the two broad objectives of multilevel analysis is to explain variance in individual -level behaviours in terms of individual and group level effects.” While listing the above authors in the references, you will use the following format: Boyd, Jr., Lawrence H. and Gudmund R. Iversen (1979) *Contextual Analysis: Concepts and Statistical Techniques*. Belmont, CA.: Wadsworth Publishing Company.

In their widely read book, which has been equally widely referred to, Almond and Verba (1965:338) write, “Recent studies of political behaviour call the rationality-activist model into question, for it is becoming clear that citizens in democracies rarely live up to the model.” In the reference this will be listed as: Almond, Gabriel A. and Sidney Verba (1965) *Civic Culture: Political Attitudes and Democracy in Five Nations*.” Boston: Little, Brown and Company. If there are three or more authors, cite in the text only the first name and suffix *et al.* to the name. E.g. “Seeking to explain the 1992-93 communal violence in Mumbai, Hebsur, *et al.* (1995) employ six alternative *but* related theories.” But, give all the names in the references, as follows: Hebsur R K., Jacob Aikara, Chandan Sengupta, and S. Siva Raju (1995) “*Factors Contributing to the Bombay Riots, 1992-93: A Report Submitted to the (Mr Justice Srikrishna) Commission of Inquiry*” Bombay: Tata Institute of Social Sciences.

N.B. Only the name of the first author is inverted in the list of references at the end of your thesis. The names of the second (and the third, etc.) authors are not inverted.

(e) Government Publications

In the text, you should cite (Maharashtra Census Directorate: 1986). In the list of references, use the following format:

Maharashtra Census Directorate (1986) *Census of India 1981, District Census Handbook: Greater Bombay*. Bombay: Director of Government Printing and Stationery.

(f) Two or more works by the same author

Kohli, Atul (1987) *The State and Poverty in India: Politics of Reform*. Bombay: Orient Longman.

_____ (1991) *Democracy and Discontent: India's Growing Crisis of governability*. Cambridge: Cambridge University Press.

[University of Chicago Press (1998) calls these, i.e. “—” ,”three em-dashes”].

(g) References to two publications of an author in the same year:

Sheth, D. L. (1975a) “Structure of Indian Radicalism”, *Economic and Political Weekly*, Vol.10, Nos.5-7, (Annual Number), pp.319-333.

_____ (1975b): *Citizens and Parties: Aspects of Competitive Politics in India*. New Delhi: Allied Publishers

15.8 STYLE AND LANGUAGE

There are many types of research reports, depending on the purpose and the sponsor/ audience. Usually, but not always, the research reports sponsored by the agencies of the government want only useful data, some minimal interpretation, sturdy and actionable solutions, and suggestions. They do not need theorisation, much less critical and comparative reviews of theories. But, theses at the M A, M. Phil., Ph. D. levels require strong, novel and robust theorisation, which you should develop. Therefore, Shah (1977) advises that the writer should keep the audience in mind. To this Kerlinger's (1995: 645) injunction may be added:

The purpose of the research report is to tell readers the problem investigated, the method used to solve the problem, the results of the investigation, and the conclusions inferred from the results.

The following suggestions Shah (1977) and Kerlinger (1995) may be noted.

- Write in clear and simple English. Do not use complex sentences.
- Allow the draft to cool. You will be surprised at the number of mistakes you will discover when you read your draft after sometime. (But, unfortunately, all these are written against a deadline.)

To this, the following may be added.

- Get your draft whetted by your classmates.
- Also, get your draft whetted by an expert in English grammar and usage, who is familiar with social science diction.

15.9 SUMMARY

Over a period of time, a few conventions, formats and styles of presentations of social

science research reports have evolved. A considerable degree of consensus over these conventions, etc. has also developed. This helps in the dissemination of knowledge, its proper understanding, appreciation and critique - across the continents and universities, and among the individual scholars, the various disciplines of social sciences. These conventions have become simpler, and reader and printer friendly. They do not impose any fascist/ or dictatorial regime, they actually facilitate discussion and argumentation and encourage further research. Some of the features of scientific presentation include citations, quotations, tables, charts and figures, pagination and style and language aspects. These have evolved over a period of time and have given new meaning and substance to the research presentation. These aspects have been dealt at length in the present Unit.

15.10 TERMINAL QUESTIONS

1. Discuss in depth the evolving features of scientific presentation in research methodology.
2. How are the abbreviations formatted in research findings and what purpose do they serve in making the presentation more effective?
3. How should a researcher focus on the pagination and chapter for a better research outcome?
4. Write short notes on the following:
 - (a) References and Bibliography
 - (b) Quotations in scientific presentation
 - (c) Style of presentation and Language in research methodology

SUGGESTED READINGS

***Many authors, articles and books have been cited in preceding text only for the sake of illustrations and examples. They belong to diverse themes in various social sciences and philosophy of social sciences. Even a Census of India Publication has been cited. The citations of books and articles have been used to exemplify and highlight only particular points. No purpose will be served by listing each one of them in the alphabetical order in this section on references. Also, it will be duplication. But some books, which have been often cited, have been listed below. And there are additional books on style. For the style and examples, etc. the following may be referred to:

Boyd, Jr. Lawrence H, and Gudmund T Iverssen., *Contextual Analysis: Concepts and Statistical Techniques*, Wadsworth Publishing Company, Belmont,CA, 1979

Campbell, William., *Form and Style: Theses, Reports, Term Papers*, Houghton Mifflin and Company, Boston, 1978.

Chicago University Press, (1998) *Chicago Manual of Style*, Prentice Hall, New Delhi

Delaney, Tim., *Comparative Social Theory: Investigations and Applications*, Pearson Education, New Delhi, 2008.

Jayaram, N., *Manual of Style*, Tata Institute of Social Sciences, Mumbai, 2009. (This can be accessed only through [www. tiss.edu](http://www.tiss.edu))

Kerlinger, Fred, N., *Foundations of Behavioural Research*, (Third Edition) Prism Books Private Ltd, Bangalore, 1995.

Rosenberg, Morris., *The Logic of Survey Analysis*, Basic Books, New York, 1968.

Skocpol, Theda., *States and Social Revolutions: A Comparative Analysis of France, Russia and China*, Cambridge University Press, Cambridge, 1979.

Shah, Vimal., *Reporting Research*, Agricultural Development Council, New York, 1977.

Turabian, Kate L., *A Manual for Writers of Term papers, Theses and Dissertations*, University of Chicago Press, Chicago, 2007.

UNIT 16 COMPUTER APPLICATIONS IN SOCIAL SCIENCE RESEARCH

Structure

16.1 Introduction

Aims and Objectives

16.2 Before the Advent of Computers and After

16.3 Microsoft Programmes

16.4 Websites

16.5 Search Engines

16.6 Summary

16.7 Terminal Questions

Suggested Readings

16.1 INTRODUCTION

As the civilisations became more complex, as commerce within a region, among the regions of a country, and among the countries increased, and as administration became more complex, the need for devices for counting and performing various types of arithmetical calculations accurately and speedily became increasingly urgent. Also the advances in science and applied sciences, like aviation, metallurgy, architecture heightened the need for devices that can execute with speed more complex mathematical calculations, in addition to the arithmetical ones. Again, collecting and analysing the data for census and tax became increasingly huge tasks. Towards the end of the 19th century, it became difficult to complete the task of analysing the Census data, before the next census commenced. Research in political science also no longer remained confined to only historical, legal and philosophical analyses. The number of democracies increased. This required some kind of voting behaviour analysis. Sampling techniques became increasingly sophisticated, giving a boost to the subject of statistics. The psychologists refined attitudinal measurement and scaling. As the political science and other social sciences became increasingly empirical, the need for accurate, fast and self-executing machines and specialised programmes increased.

Long time ago, the invention of abacus facilitated speedier of calculations. Before the advent desk or pocket calculators, there were Halda Facit calculating machines, which had turning handles. Even these were slow, and had to be operated manually. But, not only faster calculability, but also self-executing programmability were required. Imagine you have hired a manual labourer at the rate of Rs 150/- per day. You have also promised him an incentive bonus of two days per month for punctuality and an overtime payment at the rate of $1\frac{1}{2}$ times per hour. He has worked punctually for a month, he has also put in 11 hours of overtime. Now you have to calculate his total wages. You cannot instruct your pocket calculator, or desk top computer to perform all these operations sequentially and arrive at his total monthly remuneration. You have to calculate

each type of payment, note it down and then add them up. There is no self-executing programmability.

The self-executing programmability was achieved through a series of inventions. Around 1800 Joseph Jacquard, a French weaver, invented a system of punched cards to weave on his loom cloth with certain raised patterns. The idea was picked up by Hollerith, an American to store data: say monthly wages of a worker. He also invented a punching machine and a tabulator. Hollerith's company became later on the IBM. The electronic computers of 1940's, which used the vacuum tubes, constitute the next stage. This was followed by the stage of semi-conductors, or chips in the 1980's for data storage and processing. These chips are integrated to form micro-processors. A computer essentially consists of input device, (now a key board), memory, logic and arithmetic unit, control unit, output device (monitor screen and printer). Both mainframe (huge and time sharing) and stand alone or personal computers (PCs) are in use. Mainframe computers are huge machines, which attend to a number of users. These days you will find in many universities students sitting in front of a monitor each with a key board. The students are asking the computer to do different tasks: typing, calculating, printing, etc. The computer registers the jobs of multiple users in a queue and attends to them serially. They are so fast that you will think that the computer is dealing only with you. In fact, it is attending to the different requests of the multiple users in the sequential order of the queue. Further miniaturisation has led to laptop computers. You can carry them around. You might have seen in many libraries students taking down notes on the laptops directly.

Aims and Objectives

This Unit would enable you to understand

- The use of computer applications in research work;
- The Microsoft programmes that aid in enhancing the research work;
- The usefulness of websites and search engines in research methodology.

16.2 BEFORE THE ADVENT OF COMPUTERS AND AFTER

Before the modern computers were developed, social research and production of theses laboured under severe handicaps and limitations. Beyond a point, constructing a univariate frequency distribution table became a frustrating job. Imagine you wanted to construct for just 200 students, the frequency distribution table of those who have scored above 60 percent or more marks in arithmetic. You will first make vertical list of individual marks in an ascending or descending order: e.g., 60, 61.. 100. You will then go to answer books/ mark sheets. For each student you will put a tally mark, e.g ., . When number of students scoring reaches 5 you will put an angular tally mark across the four tally marks to indicate a bunch of 5 students. You will then count the bunches of 5's to arrive at a univariate raw frequency distribution table. Then you will manually calculate the percentages of students against each mark to the base of 100. Imagine the above group of students consisted of 120 boys and 80 girls. You will draw a table consisting of 2 columns and 41 rows, - a column each for boys and girls, and a row each for a mark from 60 to 100. You would then start with tally marks, bunch them, count them, and manually percentage them. Calculating the square roots of a number has always been an

arduous task. Almost all statistical tests require calculations of squares and square roots. Now these calculations are an integral part of sophisticated softwares like Statistical Package for Social Sciences (SPSS).

Owing to the sheer speed of the calculations, it is now possible to process and analyse huge data bases: survey based data or aggregate data i.e. data compiled by government authorities, more or less regularly or routinely, and aggregated at the ascending levels, villages, tahsils, districts, states, or voting data at the levels of polling booths, assembly segments, (or the assembly constituencies), Lok Sabha constituencies. In major cross national or cross regional surveys, involving large samples, have been undertaken. A couple of examples of how the fast computers have facilitated the huge research projects involving aggregate data. In early 1968 Myron Weiner and his associates at the Massachusetts Institute of Technology undertook the enormous task of compiling the electoral statistics of 3000 assembly constituencies in India. (The fast PC's or mainframes had not arrived then, and the scholars used the slow and punched card reading main frames.) The statistics included the variables like the size of the electorate, votes polled, valid votes, votes and seats won by the different political parties, for all the elections till 1967. A four-volume series came out of this data base.¹ Dasgupta and Morris-Jones sought to explain political participation, part competition for the general elections from 1952 to 1967 with the help of indices of socio-economic development and cultural pluralism. Their units of analysis are 294 districts in India².

Superfast computers have also enabled large-scale political and other studies, mostly involving voting behaviour. The credit for pioneering and continuing such election studies must go to the Centre for the Study of Developing Societies, Delhi. For example, brief analyses of the survey of April-May 2009 Lok Sabha Elections were first reported in *The Hindu* of 26 May 2009 only – a record in data collection and processing. The entire issue of *Economic and Political Weekly* (No. 39, Vol.44, September 26-October 2, 2009) was devoted to the various aspects of the 2009 elections.

The above cited study involved both aggregate and survey data. The advent of computers has facilitated large scale comparative surveys³. A good command over the issues involved in comparative social analysis coupled with knowledge of statistics and SPSS should encourage you to undertake comparative political inquiries- whether involving surveys or aggregate data.

India is the most complex society of the 21st century. Opportunities of comparative social and political research abound.

Most of you are by now are familiar with email. There are many e-mailing systems like hotmail, Gmail, Yahoo, etc. They have the attachment facilities, i.e. you need not write an entire article in the space for email. You can attach your article not exceeding a particular size, i.e. number of words, or even a picture in certain formats and send it to your teacher, editor of a journal, or editor of a book. The emails became popular around 1995, their usage suddenly spread very soon. If your document is very large, you can compress it with software called Winzip, so that it falls within the upper limit of the size. At the other end, the receiver 'unzips' the compressed document, and brings it to the normal size, and reads or prints it. The editor of a book or the journal, or your own teacher will send his comments or queries also by email.

16.3 MICROSOFT PROGRAMMES

MS Word

The almost universally used software for typing or composing texts is Microsoft Word, 2007. Typing on a PC has taken out the sweat and toil of typing on a manual typewriter.

In the era of manual or even electric typewriters, the typographical and other typing errors had to be erased with a white paint, and correct version was typed in the painted spaces. If a paragraph contained a wrong sentence or wrong lines or if the whole paragraph had to be replaced or if a paragraph was out of context or had to be replaced, or if more than a paragraph contained mistakes, the whole page was typed again. Sometimes, just to insert a new paragraph and maintain continuity, three or four pages had to be retyped. The MS word enables you to delete the mistakes- words, sentences, paragraphs and even pages.

With some typing speed you can yourself type the thesis. Earlier, you would prepare a handwritten manuscript and give it to a typist. Then the typist would type the first draft. Generally, the typists are not a highly educated lot. They would make mistakes. Also, not everybody's handwriting is eminently legible. All these led to typing many revised drafts. Even with the advent of the PCs, there can be many drafts. But the tortuous toil is not there.

The manual typewriters used to come with only two sizes of fonts, elite (small) and pica (large). Now your PC's have font sizes from $1\frac{1}{2}$ font to 72. You can easily format the title of chapters, sections and sub sections in decreasing sizes of font. The normally accepted font size for theses is 12. Also, a wide variety of types of fonts are available from Times New Roman (which is commonly used), Ariel to Lucinda Calligraphy (which is not used in thesis writings).

On the tool and menu bars of your PC, you will find B (for bold), *I (for italics)* and U (for underlining). Many types of underlining are available -single, double, waves,- etc. In the days of the manual typewriters, most models did not have the *italic* fonts. Instead, even till 1995 on the PCs with dot matrix printers, underlining was used as a substitute for *italicisation*.

The manual typewriters allowed only one type of justification (straight margin) viz., left. Now the PC allows you format your text in left justification, right justification, both left and right justification (as in a printed book, or this essay), and central justification.

You can, on the PCs, choose your spacing between the lines, 1. 1.5, 2, etc. You can even opt no spacing, and type one line just below another.

Drawing tables on a manual typewriter required great skill and labour, particularly drawing lines for columns. Now you can instruct the computer to draw an $n \times n$ table. You can merge, divide cells, and also adjust and alter the space between the columns and rows. An example is given below:

Table 1

Gender/ voting	Male	Female	Total % (N)
Voted			
Not voted			
Total % (N)			

In the days of manual typewriters, the various types of mathematical symbols had to be inserted by hand, e.g., “, “, μ , “”, á, â, $\cong$, $\sum_k \binom{n}{k}$, £, €, etc. Now in-built options of special characters and equations are available.

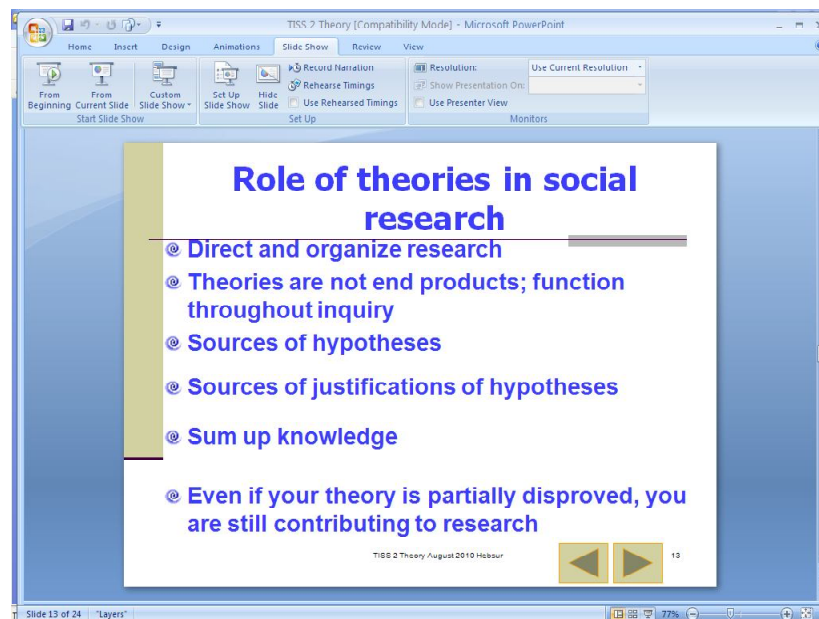
MS Word helps to avoid spelling mistakes, and to some extent grammatical mistakes. When a word is wrongly spelt, a wavy redline appears under the word. If you right click on the word, the correct options drop down. But, even the British spellings are shown as mistakes. The blue wavy lines indicate if there is correct space between two words, or if an article or preposition is missing, etc.

A document in the MS Word format can be changed and altered. But, if a publisher does not want the final page proofs of your book or article to be altered again, or heavy amendments made to it, he will send them in the Portable Document Format (PDF). You can attach corrections, as if using a slip of paper.

PowerPoint (PPT)

With the help of MS PowerPoint, you can develop slides for projection. Mercifully the days of reading a paper out in seminar are over. Listening is the most difficult skill for the participants. With the help of PPT presentations, you can get the participants to listen as well as focus on the point that is projected. You should not simply read out the points in a

Figure 1



projected slide. You should use the points to develop an argument or a statement. You also should avoid inserting long sentences, much less whole paragraphs on a slide. Adopt, as far as possible, the rule of 6 x 7 i.e. six bullet point phrases, each with, as far as possible, seven words. Sometimes, you have to make an exception and insert a long sentence; an example of a slide is given above in Figure 1,

Excel

This is a most commonly used and a very versatile spread sheet. The rows and columns are sequentially numbered. You can use it for almost any arithmetical / algebraic operations. It is used extensively in university admissions, entering grades, marks, etc. If

you learn how to enter an equation correctly, you can perform complex mathematical operations. Another easy feature of the Excel programme is the graphics. You can create univariate (single variable) tables in Excel, e.g., voters voting for political parties. You can then convert it into a pie chart a graph (See Figures and 2 below).

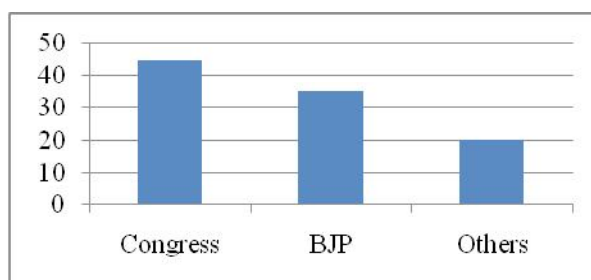
Table 2
Percentages of Votes Polled by Parties

In Percentages

Party	% Votes
Congress	45
BJP	35
Others	20
Total %	100 %

Figure 1

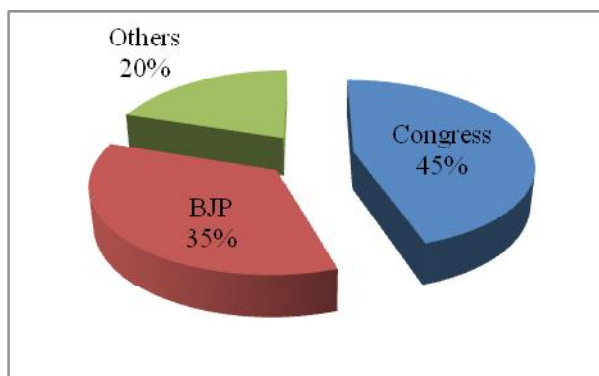
Percentages of the votes polled by Parties
(in percentages)



You can also opt for a diagram, as below

Figure 2

Percentages of the Votes polled by parties



Specialised Statistical Operations and Software Programmes

A few scholars, having dealt with research problems involving complex and higher level statistical analysis, have evolved sophisticated packages, which enable you to perform the required operations. The most popular one is Statistical Package for Social Sciences (SPSS), which is very user friendly. You do not have to enter any equation. All that is expected from you is to understand the fundamental statistical concepts like mean, standard deviation, variance, sampling error, confidence intervals, parametric and non-parametric tests, correlation, regression, etc. It must be repeated here that all that is expected from you is an understanding of the concepts: what they measure and indicate. You should take a fancy for any method of analysis or test. There are definite but simple rules regarding what test can be applied in what kind of an analysis.⁴

The SPSS is all about analysis of quantitative data and their analysis. Whether a simple or complex analysis, you begin with units of analysis. These units may be, e.g., (a) voter 1, voter 2, voter 3.....to voter n . Or, (b) child 1, child 2, child 3 to...child n . Or, (c) districts of an Indian state: district 1, district 2, district 3,...to district n . Or, school 1, school 2, school 3... school n .

Each one of the series of units of analysis has its characteristics or dimensions, or values. For example, each voter has his age, gender, caste, religion, educational level, income, level of political awareness, opinion about a party's performance, the party he voted for in the previous elections, etc. These are called variables. In other words, a variable is a value, qualitative (but can be counted), like gender or caste of a voter, the party he voted for, or quantitative, like, age, household income, land ownership in terms of acres, family expenditure on education of children.

Some variables are not influenced by others; on the contrary, they influence or affect others: e.g., age, caste, religion and education may affect voting and party preferences. But, the party preferences cannot affect a person's age, caste, or religion. The caste composition of a constituency may affect a percentage of votes polled by an elected candidate, but the winning or losing of candidates in a constituency cannot determine the castes of the candidates. Hence, age, gender, caste of a voter are called independent variables and voting/not voting party preferences, etc. are called dependent variables. Again how these variables are measured is important. The variable of gender has two variates, or values: male and female; the variable of residence may have two variates: urban and rural. Again, the variable of religion may have among others, say, five variates: Hindu, Muslim, Christian, Sikh and Others. In these sets of variates or values none is superior; none is inferior; none is higher, none is lower. Nor is any numerical value attached with each category. These are called nominal variables. They occur very frequently in social research.

Sometimes, at the stage of data processing, we convert the actual age of voters into young, middle age, and elderly, in the ascending or descending order. Or, you will have to classify, say, your voter respondents on the basis of their income into rich, middle, poor and very poor. Using (a) ascending income groups (b) ascending educational categories (c) ascending occupational prestige categories, you can construct a variable, Socio-Economic Status, with low, middle and high values/ rankings. These variables, viz., age groups, income groups or groups of socio-economic status, are called ordinal measures.

The actual numerical age or income of a voter marks in arithmetic or physics of students are called scale measures. You can perform all the arithmetical operations: addition, subtraction, multiplication, division, and square roots. These major typologies, independent

and dependent variables, and nominal, ordinal scale measures will be crucial when you study analysis and presentation of quantitative data. You have to take these two typologies into account when you apply various types of statistical tests to your quantitative data either manually or with the help of SPSS.

The SPSS has two views: data view and variable view. The data view is a spread sheet, i.e. a matrix of rows and columns: rows and columns. You use the rows for the units of analysis, viz., student 1, student 2, student...*n*. The columns are meant for each variable, For example, a student's score in mathematics is entered in column 1. His/ her score in physics is entered in column 2. The gender (coded as Male=1, Female=2) is entered in column 3. (see Figure 4).

The variable view is used for data definition. (See figure 4.). Here each row stands for a variable. In the column "Name" you give brief name of the variable. In the column "Type" mention whether your variable is numeric or otherwise (various options are available). In column width you mention the maximum number of digits your numeric variable will run into (default being 8). In the column "Decimal" you enter the decimals of the each variable. In the column "label" you enter the full title of your variable.

Figure 4: SPSS Data view

	smostudent	ScoreMath	ScorePhy	Gender	schooltype	familySES	MathPhy	var	var	var	var	var	var
18	18	93	88	1	3	2	91						
19	19	26	30	2	1	2	28						
20	20	54	60	1	2	1	57						
21	21	20	23	2	3	2	22						
22	22	68	78	1	1	1	73						
23	23	78	90	2	2	3	84						
24	24	45	50	1	3	1	48						
25	25	98	99	2	1	2	99						
26	26	56	65	1	2	1	61						
27	27	94	09	2	3	2	92						
28	28	78	89	1	1	1	84						
29	29	65	56	2	2	3	61						
30	30	94	80	1	3	1	87						
31	31	13	12	2	1	3	13						
32	32	29	30	1	2	1	30						
33	33	86	68	1	3	3	77						
34	34	45	54	2	1	1	50						
35	35	64	60	1	2	2	62						
36	36	91	92	2	3	2	92						
37	37	19	20	1	1	2	20						
38	35	64	63	2	2	1	64						
39	39	93	88	1	3	2	91						
40	40	26	30	2	1	1	28						
41													
42													
43													
44													
45													
46													
47													
48													
49													

In the column 'Values' you insert the codes in the drop down menu. As said above, in the above example, male students are coded=1, female students are coded=2. Coding is extremely important in any statistical analysis of data, which contain nominal and ordinal variables. The columns "missing", columns, "alignment" are not important for simple analysis. But, the last column "measure" is important. If you click on "measure", three options drop down: Scale, Ordinal, Nominal, which have been discussed above. You have to choose the correct one: as "nominal" for gender, and scale for scores in mathematics and physics. As said above coding is an extremely crucial step in SPSS analysis. For example, you can score in mathematics=1, till, say the 6th subject of drawing=6.

Figure 5. SPSS Variable view

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure
1	smstudent	Numeric	8	0	Serial number of the student	None	None	8	Right	Scale
2	ScoreMath	Numeric	8	0	Score in Physics	{1, Score in Ph	None	8	Right	Scale
3	ScorePhy	Numeric	8	0	Score in Mathematics	{1, Score in Ph	None	8	Right	Scale
4	Gender	Numeric	8	0	Gender of the Student	{1, Male}...	None	8	Right	Nominal
5	schooltype	Numeric	8	0	Type of school	{1, Municipal}..	None	8	Right	Nominal
6	family3CG	Numeric	0	0	Family Socio Economic Status	{1, Low}...	None	0	Right	Ordinal
7	MathPhy	Numeric	8	0	Total score of Math+Physic	None	None	8	Right	Scale
8										
9										
10										
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This is only a brief introduction to data entry. You will learn more when you sit in front of a monitor and open an SPSS file. It is both an enjoyable and educative experience when you start operating SPSS.

The following data processing operations can be easily performed using SPSS.

Checking the data entry for errors

Whether you yourself enter the data of your interview schedule in the Data View, or get it done through a computer operator, there are likely to be wrong entries. You or he may have entered, by mistake, in the column for gender a couple of times 3, when only 1 and 2 are the legitimate codes. Or, instead of 79, you may have coded 779. Taking a frequency distribution for each variable will show you if there are any illegitimate codes. But how to find out in which case an illegitimate entry –actual value or code- has been entered? You should always give serial number to units and enter them. A cross tabulation of serial number and codes/values will help to detect the unit (or the case) which has been wrongly coded. Nobody can help you if have wrongly coded a boy as 2, and a girl as 1. Double checking the data entry manually is the only way.

Reclassifying the variables

Suppose you have coded the states of respondents of a survey as: Andhra Pradesh=1, Karnataka=2, Kerala=3, Tamil Nadu=4, Gujarat=5 and Maharashtra=6. Many times, in social research, combining these categories becomes necessary. You want to re-categorise the states into two only: South Indian States and Western Indian States. Then you resort to the SPSS command in data view: Transform > recode, > into different variable > old value > new variable. That is, you will recode old 1, 2, 3, and 4 as the new 1 and label the new variable as Southern States. Then you will recode 5 and 6 as the new 2 and label the new variable as Western States. There is a commonsensical view of tabulation

in social research: when you create a table, no cell of the table should be blank, or contain fewer than 10 units. Hence combining codes becomes necessary.

Computing new variables

If you want the total score of mathematics and physics, you compute it by giving a new command that these variables should be added, a new variable created, given a new name and entered in new column in the Data View. Or you may want to give double weight to mathematics. Again, you compute it by multiplying the variable by 2 in the Compute Box.

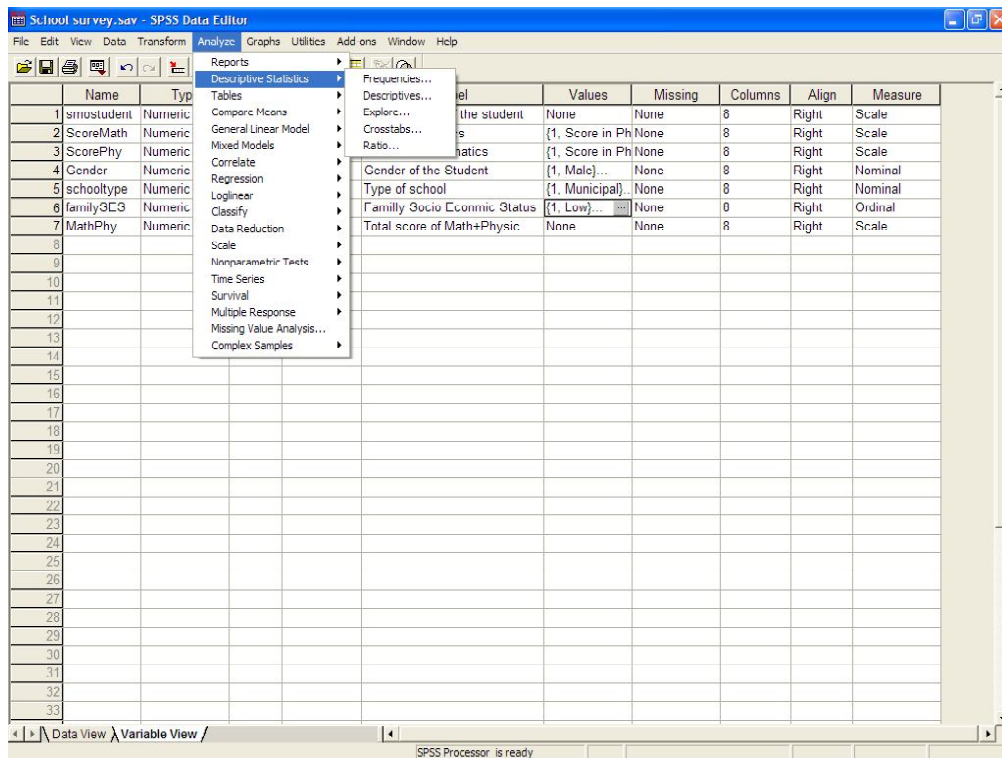
Selection of cases

If you want the frequency distribution of marks for only boys, you select boys=1. The girls are automatically omitted.

Types of Statistical Analysis

Figure 6

Drop own menu for frequencies, etc.



If you want to calculate descriptive like mean, minimum, maximum and standard deviations, you should go variable view,> analyse, > descriptive statistics, >

Descriptive, and enter in the dialogue box the scale variables, in our case, score in Mathematics and score in physics. You will get the following output or table

Table 3

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Score in Physics	40	13	98	62.15	27.221
Score in Mathematics	40	12	99	62.73	25.944
Valid N (listwise)	40				

Similarly, the drop down menus under Analyse will give you many related options. They are for example, two way bivariate tables (one independent like gender, and the other like groups of scores in mathematics, or both independent variables like gender and socio-economic status), correlation, regression, factor analysis and so on.

Other Statistical Software Programmes

In addition to the widely used SPSS there are other sophisticated statistical software programmes like SAS (Statistical Analysis System) and LISREL (Structural Equation Modeling). While SAS is multipurpose statistical analysis package, LISREL deals with the issues related to path analysis. For example, high educational levels of parents positively affect the educational aspirations of their children. But parents with high educational level also have higher interaction levels with the teachers, who may give more attention to the children. Through LISREL, one can find which route or path is more effective- direct or indirect.

16.4 WEBSITES

Even as recently as 1995, research scholars had to go to the various libraries or even the various offices of Government of India, like the Census of India Office in New Delhi or states or various libraries to consult, and collect data from the government publications like the Census of India, Statistical Abstract of India, Statistical abstract of a state, Election Commission of India, Offices of the state election commissions, etc. Now all these are put on the World Wide Web of each governmental organisation. You can download the data from the websites. If you visit www.censusofindia.net/, the site opens with various options/index like, “individual SC/ST data, maternal mortality, Census of India Outline, 2001 Census Results –index”. Searching for the precise Economic Tables will give you for the entire country (or the states) the following sets of tables, among others:

Main workers, marginal workers, non-workers, and those marginal workers, non-workers seeking available for work classified by age. Main workers, marginal workers, non-workers, and those marginal workers, non-workers seeking available for work classified by age, among the Scheduled Castes.

Main workers, marginal workers, non-workers, and those marginal workers, non-workers seeking available for work classified by age, sex and religion. Main workers, marginal workers, non-workers, and those marginal workers, non-workers seeking available for work classified by educational level and sex. Main workers, marginal workers, non-workers, and those marginal workers, non-workers seeking available for work classified by educational level and sex for Scheduled Castes and Scheduled Tribes.

You can imagine the research potential of each of the above Tables, selected among the many for the sake of examples. You can calculate, for example, the incidence of unemployment (job seekers) among the various religious groups by religion, controlling for age and gender. Similarly you can compare the incidence of unemployment among the Scheduled Castes and Scheduled Tribes.

Similarly you can, beginning with the most popular search engine, go on narrowing the scope of your search and get on your computer monitor the documents/publications like latest edition of the Constitution of India, Central Education Institutions Act, Right to Information Act, and the like. Similarly, the various political parties have their websites. The documents like party manifestoes, statements of the party leaders can be accessed

through them. For example, the monthly magazine of the Communist Party of India, *Peoples Democracy*, with the issues going back to January 2009 is available through the party's web site. Similarly the site of the Indian National Congress takes you to the party magazine.

Almost all the newspapers' daily editions, like *The Hindu*, *Deccan Herald* are available on the web. Before the elections they carry useful articles. Before the April–May 2009 Lok Sabha Elections, *Deccan Herald* carried the caste background of the candidates of the each of major political parties of Karnataka, viz. Congress, Bharatiya Janata party, and Janata Dal (Secular). This information was extremely useful to those political scientists who were interested in studying the social bases of the parties in Karnataka.

16.5 SEARCH ENGINES

The search engines like Google, Wikipedia are very useful to the researchers. The Google is a massive search engine which has cross references to Wikipedia also. Both the search engines are like encyclopaedias but with a lot of difference. Google is also an encyclopaedia of other web sites, including Wikipedia. If you type in the title bar of Google “Mohandas Karamchand Gandhi”, a menu drops down with some major items. If you click on the main theme, hundreds of websites containing articles on Gandhi are displayed. You have to search many websites to locate a particular article that is useful to you, which is a laborious task. But, nothing is easy in social research. Or, you will type in the title bar, for example, “Mohandas Karamchand Gandhi and Mohammed Ali Jinnah”, lists of many related articles and websites will drop down. Again, if you type in the title bar “Gandhi and Ambedkar”, lists of many related articles/web sites drop down. If you want to narrow the scope of the search still further to “Gandhi and Ambedkar and the Poona Pact”, many articles and websites drop down which contain references to both of them in the context of the Poona Pact of 1932. There may be the repetitions of the earlier articles with tangential references to either one of them, or fully deal with the interactions between Gandhi and Dr Ambedkar.

Wikipedia, on the other hand, mostly gives one article at a time (it gives under Gandhi and Ambedkar a limited range of articles). Under Gandhi, Wikipedia gives, among others, the following sections: early life, South African days, role in World War 1, Champaran and Kheda, Non-cooperation, Salt Satyagraha, Quit India Movement, truth, non-violence, simplicity, basic education, swaraj, and the like. But, the references are very few. References to the noted analysts of Gandhian thought like Raghavan Iyer, Ashish Nandy are not there. Wikipedia describes itself as a free encyclopaedia. It invites the reader to contribute more or additional information on the subject.

At this stage a word of caution must be entered. These days, the post-graduate students are tempted to take a short cut to writing papers, essays, etc. by relying only on Google, or Wikipedia, etc. They resort to cut and paste jobs. This is bound to backfire. Your teacher or examiner will quickly find out whether or not you have read the recommended works of Gandhi, Nehru, Aristotle, etc., or the scholarly works on these thinkers. There is no substitute for the reading of the treatises in the original. But, when you require the latest and up to date statistics of the Census, election data, latest Acts of the Government of India or the States, access the web as much as possible.

16.6 SUMMARY

The advent of the computers has revolutionised the social science research. The computer has taken the sweat and toil of typing the manuscripts, correcting them, adding to them, and transmitting them. Many symbols which had to be written in hand can now be inserted. Two way and three way tables can easily be created. With the help of PowerPoint presentations in seminars, you can hold the attention of the audience as well as explain a point.

With the help of Excel and SPSS, you can solve a number of arithmetical and statistical problems. Through the internet, you may access many government, and non- government statistical data bases and documents. You can use the search engines like Google, Wikipedia to search for articles. But they can never be a substitute for reading the recommended books in the original and contribute to original research.

16.7 TERMINAL QUESTIONS

1. Briefly analyse research presentation methods before and after the advent of computers.
2. What are the Microsoft Programmes that aid in the research presentations?
3. How do websites contribute to research methodology?
4. What purpose do the Search Engines serve in the arena of research work?

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