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or she is wrong. When there is only a small probability that one is incorrectly rejecting the null hypothesis (by inference, incorrectly treating group differences as 'real'), researchers say the observed differences are 'statistically significant'. The procedure for means can also be extended to comparisons of group proportions.

There are readymade computer software packages which enable one to calculate statistical significance once we have information on the size of the groups, the size of differences between them on the measure of interest, the variation of the relevant measure within each group. 'Analysts generally use 'z-tests' (for large samples or groups) or 't-tests' (for small samples or groups) to determine the statistical significance of differences between means. Both tests rely on calculations of the standard error of the difference in the means of the two groups. The larger the value of z or t, the more likely the researcher can comfortably reject the null hypothesis. This gives rise to question as to what value is big enough.

The researcher needs to know more precisely how likely it would be to find this value of z or t just by chance. The normal distribution (for z-scores) or the t-distribution (a different probability distribution for t-scores) is used to calculate the probability 'p', of finding the observed value z or t just by chance. The actual value of p will depend on the size of the difference you observed between the groups and the size of the groups. A p value of .01 says that if you reject the null hypothesis on the basis of the value you calculated for z or t, you could anticipate being wrong (meaning you shouldn't have rejected the null hypothesis) 1 in a hundred times, an error rate you likely would find tolerable in mist instances. A p value of .05 says that if you reject the null hypothesis on the basis the value you calculated for z or t, you could anticipate being wrong 5 in a hundred times, which might also be within your range of comfort.

Requiring low p values minimizes the chance that you will think you have found a 'real' difference when in fact all you have found is a 'chance' difference. Conventionally social scientists and policy analysts refer to differences as "statistically significant" when they calculate p values of .05 or lower.

Chi-square distribution

The Chi-square (χ^2) test belongs to non-parametric category of methods to rest a hypothesis. The sampling distribution of (χ^2) is called χ^2 distribution. As in other hypothesis testing procedures, the calculated value of (χ^2) test statistic is compared with its critical value to know whether the null hypothesis is true. There exist statistical tables which give critical value, which are also referred to as table values. The decision of accepting a null hypothesis is based on how 'close' the sample results are to the expected results.

Conditions for application of χ^2 test

Before using χ^2 as a test statistic to test hypothesis, the following conditions are necessary:

1. The experiment consists of a n identical but independent trials. The outcome of each trial falls into one of k categories. The observed number of outcome

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in each category written as $O_1, O_2, \ldots\ldots O_n$ with $O_1+O_2,+\ldots\ldots+O_n = 1$ are counted.

2. If there are only two cells, the expected frequency in each cell should be 5 or more. Because for observations less than 5, the value of χ^2 shall be overestimated, resulting in the rejection of the null hypothesis.
3. For more than two cells, if more than 20 per cent of the cells have expected frequencies less than 5, then χ^2 should not be applied.
4. Samples must be drawn randomly from the population of interest. All the individual observations in a sample should be independent.
5. The sample should contain at least 50 observations.
6. The data should be expressed in original units, rather than in percentage or ratio form. Such precaution helps in comparison of attributes of interest.

Chi-Square test statistics

It is given by the following formula

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

Where O = an observed frequency in a particular category

E = an expected frequency for a particular category.

The following rule is adopted. The calculated value of χ^2 is compared with its critical value at a particular level of significance and degrees of freedom. If χ^2_{cal} is more than $\chi^2_{critical}$ then the null hypothesis is rejected in favout of the alternative hypothesis, and it is concluded that the difference between the two sets of frequencies is significant.

Applications of χ^2 test

χ^2 test is used in the following cases:

1. Test of independence
2. Test of goodness of fit
3. Yate's correction for continuity
4. Test for population variance
5. Test for homogeneity

Contingency table analysis: Chi-Square test of independence

The χ^2 test of independence is used to analyze the frequencies of two qualitative variables or attributes with multiple categories to determine whether the two variables are independent. The chi-square test of independence can used to test any level of measurement, but it is particularly useful in analyzing nominal data. For example:

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1. Whether voters can be classified by gender is independent of the political affiliation.
2. Whether type of soft drink preferred by a consumer is independent of the consumer's age.

Chi-Square test for goodness of fit

On several occasions a decision maker needs to understand whether an actual sample distribution matches or coincides with a known theoretical probability distribution such as binomial, Poisson, normal and so on. The χ^2 test for goodness of fit is a statistical test of how well given data support an assumption about the distribution of a population or random variable of interest. The test determines how well an assumed distribution fits the given data. The goodness-of-fit test focuses on differences between the observed values and the expected values. Large differences between the two distributions throw doubt on the assumption that the hypothesized theoretical distribution is correct. On the other hand, small differences between the two distributions may be assumed to be resulting from sampling error.

χ^2 test for population variance

The assumption underlying the χ^2 test is that the population from which the samples are drawn is normally distributed. Let the variance of normal population be σ^2. The null hypothesis is setup as $H_0: \sigma^2 = \sigma^2_o$ where σ^2_o is the hypothesized value of σ^2.

χ^2 test for homogeneity

The test of homogeneity is useful in a case when we intend to verify whether several populations are homogeneous with respect to some characteristic of interest. For example, we may like to know we may like to know whether soft drinks supplied by different companies have a particular ingredient in common or not. Here, the test of homogeneity is useful in testing a null hypothesis that several populations are homogeneous with respect to a characteristic.

Application

The chi-square test is a statistical method to test whether two (or more) variables are: (i) independent or (ii) homogeneous. The chi-square test for independence examines whether knowing the value of one variable helps to estimate the value of another variable. The chi-square test for homogeneity examines whether two populations have the same proportion of observations with a common characteristic. Though the formula is the same for both tests, the underlying logic and sampling procedures vary.

Use

The chi-square is a statistical test commonly used to compare observed data with data we would expect to obtain according to a specific hypothesis; for example, if, according to Mendel's laws, you expected 10 of 20 offspring from a cross to

be male and the actual observed number was 8 males, then you might want to know about the 'goodness to fit' between the observed and expected. Were the deviations (differences between observed and expected) the result of chance, or were they due to other factors. How much deviation can occur before you, the investigator, must conclude that something other than chance is at work, causing the observed to differ from the expected. The chi-square test is always testing what scientists call the null hypothesis, which states that there is no significant difference between the expected and observed result.

Limitations

The limitations of the chi-square test are as follows:

- Data is from a random sample
- A sufficiently large sample size is required (at least 20)
- Actual count data (not percentages)
- Adequate cell sizes should be present
- Observations must be independent
- Does not prove causality

CHECK YOUR PROGRESS

8. What is a chi-square test?
9. What is a null hypothesis?

4.5 SUMMARY

- Quantitative data shows a tendency to concentrate on certain values, usually somewhere in the centre of the distribution. Measures of this tendency are called the measures of central tendency or averages. Arithmetic mean (or simply mean), median and mode are some measures of central tendency. They are statistical values which help us to comprehend a mass of data easily.
- Arithmetic mean of a set of observations is their total sum, divided by the number of observations.
- Median refers to middle value in a series of observations and is thus a 'positional' average. It divides the entire series into two equal parts.
- Mode refers to the value which occurs most frequently in a set of observations and around which the other items of the set cluster densely. It is that variable which is predominant in the series.
- Partition values are the values which divide the series into a number of equal parts. In the case of percentiles, they divide series into 100 equal parts, while deciles divide a series into ten equal parts.

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- The three points which divide a series into four equal parts are called quartiles. The first quartile or Q_1 is that value which exceeds 25 per cent of the observations and is exceeded by 75 per cent of the observations. The exact opposite is true for the third quartile or Q_3. The second quartile, Q_2, which divides the series into two equal parts and is in the middle is nothing but median.
- While the measures of central tendency give us a clue about the concentration of observations about the central part of the distribution, they are not sufficient in themselves. They do not give us an idea about the spread of the series or its scattering. Measures of central tendency or averages are supplemented by measures of dispersion.
- Dispersion means 'scattering'. Measures of variation or dispersion seek to capture the degree to which numerical data tend to spread about an average value.
- Range, quartile deviation, mean deviation and standard deviation are some measures of dispersion. The simplest measure of dispersion is the range which can be defined as the difference between the highest and lowest value in a series.
- Quartile deviation is defined as $Q=[Q_3-Q_1]/2$
- Mean deviation from the average, A (usually mean, median or mode) is given by the following formula: Mean deviation from average

  $A = 1/N \sum f_i |x_i - A|$

  represents modulus or the absolute value of the deviation. It represents the modulus of the absolute value of the deviation $(x_i - A)$, where the negative sign is ignored.
- Standard deviation is defined as follows: $\sigma = \sqrt{\frac{1}{N}\sum_i^n f\ I(x_i - \bar{x})^2}$

  Greater the value of standard deviation, the greater is the magnitude of the values from their mean. In such cases there is more heterogeneity. On the other hand, smaller the value of standard deviation, greater is the uniformity in the observations.
  The square of standard deviation is called the variance and is given by:

  $$= \sigma^2 = \frac{1}{N}\sum_i f\ i(x_i - \bar{x})^2 = \frac{1}{N}\sum_i f\ ixi^2 - \left[\frac{1}{N}\sum_i^n fx\right]_2$$

- Measures of association are statistics that measure the strength of a relationship between two or more variables.
- Correlation is a quantitative measure of the relationship between two variables. If changes in one variable affect a change in the other variable, then the variables are said to be correlated. 'If the two variables deviate in the same direction i.e., if the increase (or decrease) in one results in a

corresponding increase (decrease) in the other, correlation is said to be direct or positive. But if they constantly deviate in opposite directions, i.e., an increase (or decrease) in one results in a corresponding decrease (or increase) in the other, correlation is said to be diverse or negative.

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- Correlation coefficient value lies between –1 and 1. Correlation is regarded as perfect if the deviation in one variable is followed by a corresponding and proportionate deviation in the other. If correlation coefficient 'r' = +1, the correlation is perfect and positive and if r = –1, correlation is perfect and negative.
- Karl Pearson's coefficient of correlation is a quantitative measure of the degree of relationship between two variables. If the variables are 'x' and 'y', it is given by the following formula:

$$r = \rho x, y = \frac{\text{cov}(X,Y)}{\sigma_X \sigma_Y} = \frac{E\left[(X-\mu_X)(Y-\mu_Y)\right]}{\sigma_X \sigma_Y}.$$

  Here, the numerator stands for covariance between X and Y while the denominator stands for the product of standard deviation of X and Y.
- Spearman's formula is the only ideal formula for determining correlation coefficient, if we are dealing with qualitative characteristics which cannot be measured quantitatively but can be arranged serially as per their ranks. In case of extreme observations too, Spearman's rank correlation coefficient is preferred to that of Pearson's formula. Suppose we have ranks of n individuals $x_1, x_2, \ldots, x_n$ and $y_1, y_2 \ldots, y_n$. All based on two characteristics A and B, then Pearson's coefficient of correlation between the ranks x_i and y_is is called the rank correlation coefficient between A and B, for that group of individuals and is given by the formula $\Sigma = 1 \frac{6\sum_i^n d_i^2}{n\left(n^2-1\right)}$ where $d_i = (x_i - \bar{x}) - (y_i - \bar{y})$.
- The chi-square is a statistical test commonly used to compare observed data with data we would expect to obtain according to a specific hypothesis; for example, if, according to Mendel's laws, you expected 10 of 20 offspring from a cross to be male and the actual observed number was 8 males, then you might want to know about the 'goodness to fit' between the observed and expected.

4.6 KEY TERMS

- **Central tendency:** A term which relates to the way in which quantitative data tend to cluster around some value
- **Arithmetic mean:** The sum of the values of a random variable divided by the number of values

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- **Frequency distribution:** A tabulation of the values that one or more variables take in a sample
- **Median:** The numeric value separating the higher half of a sample from the lower half
- **Mode:** The most frequent value of a random variable
- **Class interval:** A range into which data may be grouped
- **Cumulative frequency:** The sum of successive data items
- **Modal class:** The class having the greatest frequency in a frequency distribution
- **Quartile deviation:** Half the difference between the upper and lower quartiles in a distribution
- **Percentile:** The value of a variable below which a certain percent of observations fall
- **Mean deviation:** The arithmetic mean of the absolute values of deviations from the mean of a distribution

4.7 ANSWERS TO 'CHECK YOUR PROGRESS'

1. The mean of the following series, i.e., 10, 12, 14, 18, 30 is computed as follows: Mean = [10 + 12 + 14 + 18 + 30]/5 = 84/5 = 16.8

   The median is computed as follows:

   There are five values in the above series. The observations are first arranged either in ascending order or descending order, i.e.: 10, 12, 14, 18, 30

   Median or middle value is 14. It divides the series into two equal parts and thus there are two observations below the median value and an equal number of observations above the median value.

2. The median and mode of the following discrete frequency distribution is as follows:

X:	1	2	3	4	5	6	7
F:	4	6	8	12	11	7	3

   The cumulative frequency is calculated as follows:

c.f.:	4	10	18	30	41	48	51

   Here N = total frequency = 51 and hence N/2 = 25.5

   Since the cumulative frequency just above N/2 is 30 and the corresponding value of variable 'x' is 4. Hence the median is 4.

   The mode is computed as follows:

   Since the maximum frequency is 12 and the value of the variable 'x' corresponding to this frequency is 4. Hence, the mode is 4.

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3. Since the continuous frequency distribution is given, the first mean is computed in the following manner:

The mid-point of each class interval is determined and then the following formula is employed to calculate the arithmetic mean:

Class Interval	No. of Students (f_i)	Mid-Point of Class Interval (x_i)	fX_i
0–10	4	5	20
10–20	5	15	75
20–30	5	25	125
30–40	6	35	210
40–50	10	45	450
50–60	15	55	825
60–70	8	65	520
70–80	7	75	525
Total	**60**		**2750**

$$\text{Arithmetic mean} = \frac{\Sigma xf}{\Sigma f} = [x_1 f_1 + x_2 f_2 + \ldots + x_n f_n]/[f_1 + f_2 + \ldots f_n]$$

$= 2750/60 = 45.8$

In other words, average mark secured by a class of 60 students in research methodology paper is 45.8.

For computing the median, first, the less than cumulative frequency column is computed and then the following procedure is used:

Median class is first determined by finding the class interval corresponding to 'f', which is just greater than N/2 and thereafter, median is computed by the following formula:

$$\text{Median} = l + \frac{h}{f}\,[N/2 - C]$$

In the above formula, 'l' stands for lower limit of median class; 'f' for frequency of median class; 'h' is the magnitude of the median class and 'c' is the cumulative frequency of the class, preceding the median class.

Class interval	No. of students (f)	c.f.
0–10	4	4
10–20	5	9
20–30	5	14
30–40	6	20
40–50	10	30
50–60	15	45
60–70	8	53
70–80	7	60

N/2 = total frequency/2 = 60/2 = 30. The cumulative frequency which is greater than N/2 is 45 and the corresponding class interval is 50–60.

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$$\text{Median} = l + \frac{h}{f}\ [N/2 - C]\ = 50 + 10\ [30 - 10]/15 = 63.33$$

If there is a continuous frequency distribution, mode is determined by using the following formula:

$$\text{Mode} = l + \frac{h[f1 - f0]}{[2f1 - f0 - f2]}$$

Where the 'l' stands for lower limit, 'h' the magnitude and f_1 the frequency of the modal class and f_0 and f_2 are frequencies of the classes preceding and succeeding the modal class respectively. By inspection of frequency table, we find that the maximum frequency is 15 and the corresponding class interval is 50–60, which is the modal class. Hence, applying the formula, value of mode will be as follows:

Mode = 50 + 10[15 – 8]/ [30 – 10 – 8] = 55.8

4. The cumulative frequency is as follows:

c.f.	3	8	14	24	31	39	44

Here N = 44 and therefore N/4 = 11 and 3N/4 = 33

The cumulative frequency above 11 is 14 and hence 20–30 contains first quartile. The cumulative frequency higher than 3N/4 is 39. The corresponding class interval 50–60 contains the third quartile.

$$Q_1 = 1 + \frac{h}{f}\left[\frac{N}{4} - C\right] = 20 + \frac{10}{6}[11 - 5] = 30$$

$$Q_3 = 1 + \frac{h}{f}\left[\frac{3N}{4} - C\right] = 50 + \frac{10}{8}[33 - 7] = 82.5$$

Hence the quartile deviation is $[Q_3 - Q_1]/2 = 26.25$

5. If two variables constantly deviate in the opposite directions, i.e., an increase (or decrease) in one results in a corresponding decrease (or increase) in the other, correlation is said to be diverse or negative.

6. Given a bivariate distribution, correlation coefficient is computed as follows by first calculating values of x^2, y^2 and xy.

X:	4	6	9	12	18	22	33	104
Y:	21	18	15	13	11	10	6	94
X^2:	16	36	81	144	324	484	1089	2174
Y^2:	441	324	225	169	121	100	36	1416
XY:	84	108	135	156	198	220	198	1099

$$r = \frac{n\Sigma xy - (\Sigma x)(\Sigma y)}{n\left(\sqrt{x^2}\right) - (\Sigma x)^2\, n\sqrt{\Sigma y^2 - (\Sigma y)^2}}$$

$$= 7(1099) - (104)(94)/7\ [\sqrt{2174 - (104)^2}]\ 7\ \sqrt{1416 - (94)^2}]$$

$$= -2083/66.35(32.80)$$

$$= -0.96$$

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7. Spearman's rank correlation coefficient is preferred to that of Pearson's formula in case of extreme observations.
8. The chi-square test is a statistical method to test whether two (or more) variables are: (i) independent or (ii) homogeneous.
9. A null hypothesis states that there is no difference between the expected and the observed result.

4.8 QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are measures of central tendency or averages?
2. What are measures of association?
3. How do statistics help us?
4. What are the merits of arithmetic mean?
5. In which cases does computation of mode present certain difficulties?

Long-Answer Questions

1. Name and explain the measures of central tendency.
2. How are correlation coefficient values interpreted?
3. Explain Karl Pearson's coefficient of correlation with an example.
4. Explain Spearman's rank correlation with an example.
5. What are the application, use and limitation of the chi-square test?

4.9 FURTHER READING/REFERENCE

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UNIT 5 REPORT WRITING

NOTES

Structure

5.0 INTRODUCTION

The last step in the research process is writing the research report. In a way, it is the most crucial step, because it is through this report that the findings of the study are communicated to the readers. The whole research enterprise can be disrupted if the report is not written logically and coherently. As Robert Burns says, 'extremely valuable and interesting practical work can be spoiled at the last minute by a researcher who is not able to communicate the results easily.' (1994: 229).

The quality of the report depends on many factors such as the writing skills and clarity of thought of the researcher, the ability of the researcher to express thoughts in a logical and sequential manner and the adequate knowledge base of the subject area. The use of statistical procedures reinforces the validity and cogency of the conclusions and arguments of the researcher. This is because they establish strong associations or relations among the variables, so that the readers can place confidence in findings of the researcher. The use of graphs and statistical methods to present the findings makes the information more easily understood by readers. A report should be absolutely accurate, clear, free of ambiguity, logical and concise. It should be devoid of ornamental and pompous language.

5.1 UNIT OBJECTIVES

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

- Estimate ways in which research findings are reported
- Explain the methods of reporting in quantitative and qualitative researches
- Compile research reports
- Write references/bibliography correctly, in accordance with standard practices

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5.2 PREPARATION OF RESEARCH REPORT

In exploring the writing process, it is useful to consider Denscombe's (2003: 286) suggestion that: 'There are some common themes and shared concerns that underlie formal reports of research across the spectrum of approaches within the social sciences'. Howard Becker in *Writing for Social Scientists* maintain:

> But that is our business: to arrange ideas in so rational an order that other persons can make sense of them. We have to deal with that problem on two levels. We have to arrange the ideas in a theory or a narrative, to describe causes and conditions that lead to the effects that we want to explain, and to do it in an order that is logically and empirically correct. Finally ... we want our prose to make the order we have constructed clear. We do not want imperfections in our prose to interfere with our readers' understanding. These two jobs converge and cannot separate.

S. Sarantakos in his book, *Working with Social Research* (1998) makes the following observations on report writing:

(i) Reporting relates to the dissemination of the information collected through this study.

(ii) Of the factors that affect the writing of the report, ethical considerations, the readers and the purpose of the report are most important.

(iii) The most common outlets of the results of a study are newspapers, newsletters, conferences, monographs, journal articles and books.

(iv) The structure of a report varies with the type and nature of publication.

(v) The main parts of a report are the abstract, introduction, method, results, discussion, conclusion, recommendation and references. Some of these parts are optional.

(vi) The criteria that mark a good report are clarity, precision, legibility, completeness, objectivity, fairness, verifiability, impersonality and ethics.

(vii) With regard to presentation, consideration must be given to whether to use the first or third person, active or passive voice, and past or present tense, and to the type of language. Requirements for the type of language are stated firmly in the text but other points are open to discussion.

(viii) Manuscripts must be subjected to vigorous self-assessment before they are submitted for publication.

(ix) The structure of a book may be similar to that of other reports but consideration must be given to its nature, scope and size.

(x) The politics of publishing constitutes a very important factor and requires adequate consideration.

5.2.1 Steps

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Before we start writing the report, it is important to develop an outline (chapterization). This means how we are going to divide the report into different units or chapters and planning about what will be written in each unit. In developing units, the objectives of the study provide immense guidance. The units should be divided around the main themes of the study. The title of each unit should be descriptive of the main theme, should communicate its main thrust and should be simple, clear and concise.

The first unit of the report should generally be the introduction. The introduction should contain the research proposal, the objectives of study, the study design, all the preparatory tasks undertaken to conduct the study and the measurement procedures. There are also several other dimensions of report writing that must be kept in mind while preparing a research report. Some of the prominent ones are:

(i) **Review of existing literature:** An essential component of research project is to go through all the relevant literature (books, journals, research papers, thesis, etc.) in order to acquaint oneself with the available body of knowledge in the area of research. A literature review has certain distinct functions. An overview of social, political, historical and cultural contexts are provided by it. It broadens the knowledge base in the research area and brings greater focus and clarity into our research project. A literature review also raises issues relating to methodology. For instance, it may examine how other studies make operational the major variables and such a review might also include a critique of the methodologies applied earlier by highlighting their lacunae and gaps.

It should be noted that it is better to review literature always under their respective themes and headings. A separate section on review of literature would involve duplication and verbosity and make the project unnecessarily unwieldy. Wherever we discuss a particular theme, the review of all relevant literature should be done there. For instance, literature pertaining to the research instruments should be dealt under the 'measurement procedures' and those pertaining to study design should be done under the 'research design'.

(ii) **Have a clear objective:** The objective of the research, the hypotheses to be tested and the research design should be laid out succinctly and clearly. There should be no ambiguity in them. Another critical dimension of report writing is to present very lucidly the relationship between variables which are being examined. Use of statistical techniques such as graphs, tables, frequency polygons, cross-tabulations, etc., should be preferred to present, quite distinctly, the analysed data and to establish the association or correlation between variables examined. An assertion on causal relationship among variables gets stronger and fortified if they are presented statistically.

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(iii) **References/Bibliography:** The references are cited either at the end of each unit or in the footnotes. The bibliography is added at the end of the report. There are several standard practices of writing references.

(iv) **Conclusion:** Along with the introduction, the conclusion is often considered the most difficult part of the report to write. It signifies the end of a lot of hard work. Henn Weinstein and Foard (2006: 240) say that the conclusion should reiterate the main points of the research and should address the following questions:

(a) What were the main findings of the research?
(b) How are these findings structured within the context of theory?
(c) What are the implications of the research?
(d) What lessons can be learnt from the experience of carrying out the research?
(e) What can be learnt from the way methods are employed?
(f) What areas are open for future research?

5.2.2 Content

Tables and graphics that are easy to understand enhance the readability of a report. These tables and graphics, as a rule, should be clearly labelled and numbered throughout the report with reference callouts appearing in the text. The numbers in tables and graphics should correspond to the list of tables and figures provided in the report. Appropriate columns and row labelling for the legends of the tables and figures is a must for all impressive reports. Tables may be directly typed on the soft copy of the report using a typewriter or a word processor. However, more complicated reports must be produced with the help of Lotus 123 or MS Excel.

5.2.3 Style

A report on qualitative social research is quite difficult to write, unlike a quantitative report. This is because a qualitative report has an informal structure and fewer guidelines. The data presented in a qualitative report is difficult to condense as they are in the form of words, sentences and pictures. A qualitative research gathers data through techniques that are not standardized. Thus, researchers need to create analytical categories and organize evidences in their own way.

The qualitative research reports are informal in tone and rarely follow a standard format with dedicated sections. Generalizations are mostly intertwined in the data and not presented separately. The qualitative researchers create empathy in the readers towards the subject being discussed along with a presentation of data. They also provide analytical findings and evidences to support their research. A comprehensive description of the setting ropes in the readers for a further detailed discussion of the various sections of the report among readers in addition to presenting factual evidence and analytical interpretations. Detailed descriptions of specific settings and situations help readers better understand or get a feel of

settings. Researchers attempt to transport the reader into the subjective worldview and meaning system of a social setting.

CHECK YOUR PROGRESS

1. According to Sarantakos, what are the main parts of a report?
2. What are the criteria that mark a good report?
3. In a report, what should the first unit generally be?
4. Where are references cited in a report?

NOTES

5.3 SUMMARY

- A research report is a written document or oral presentation based on written matter that communicates the purpose, scope, objectives, hypothesis, methodology, findings, limitations and finally recommendations of a research project to others.
- Before preparation of a report, the problem or the key research area should be clearly defined.
- The research design and methodology should be in place.
- Data analysis for a report should be followed by a clear interpretation of the research findings.
- Effective report writing is an art. The most important characteristic of a report is that it should be easy to follow and understand.

5.4 KEY TERMS

- **Bibliography:** A list of writings with their time and place of publication
- **Quantitative research:** Research that is objective and relies on statistical analysis, such as surveys
- **Qualitative research:** Research that is conducted to determine subjective information about a company, product or an advertisement campaign
- **Manuscript:** Any document which is transcribed by hand
- **Theoretical framework:** A basic conceptual structure that is organized around a theory
- **Verbosity:** The excess use of words
- **Hypotheses:** A proposed explanation for an observable phenomenon

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5.5 ANSWERS TO 'CHECK YOUR PROGRESS'

1. The main parts of a report are the abstract, introduction, method, results, discussion, conclusion, recommendation and references.
2. The criteria that mark a good report are clarity, precision, legibility, completeness, objectivity, fairness, verifiability, impersonality and ethics.
3. The first unit of the report should generally be 'Introduction'.
4. The references are cited either at the end of each unit or in the footnotes.

5.6 QUESTIONS AND EXERCISES

Short-Answer Questions

1. What are the factors on which the quality of a report depends?
2. What is the most important thing to be done before writing a report?
3. What is an essential component of a research project?
4. What are the distinct functions of a literature review?

Long-Answer Questions

1. What were Sarantakos's observations on report writing?
2. List and explain some prominent dimensions of report writing.
3. Discuss the common styles of writing a research report.

5.7 FURTHER READING

Becker, Howard S. 1986. *Writing for Social Scientists: How to Start and Finish Your Thesis, Book or Article.* Chicago: University of Chicago Press.

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