

Block

3

TOOLS AND METHODS OF DATA COLLECTION

UNIT 1

Methods of Sampling **5**

UNIT 2

**Research Tools: Questionnaires, Rating Scales,
Attitudinal Scales and Tests** **27**

UNIT 3

Interview, Observation and Documents **46**

UNIT 4

Data Collection **59**

BLOCK INTRODUCTION

“**Tools and Methods of Data Collection**” is the third block of the course on Social Work Research. This block consists of four unit and each units provide you information regarding sampling and tools for data collection.

Unit 1 is on **Methods of Sampling**. It deals with basic concept of sampling, probability sampling, systematic sampling, proportionate stratified random sampling, disproportionate stratified random sampling, non probability sampling, combination of probability sampling and non-probability sampling and characteristics of a good sample.

Unit 2 is on **Research Tools: Questionnaire, Rating Scales, Attitudinal Scales**

and Tests. This unit will give you relevant information about measurement in social research, concept of measurement, levels of measurement, nominal, ordinal, interval and ratio level, tools of data collection, rating and attitude scale.

Unit 3 is on **Interview Observation and Document**. It deals with types of tools and their uses, interview, observation and documentations which are essential for empirical study in social work.

Unit 4 is on **Data Collection**: In this unit we have discussed about the concept of data, methods of data collection, utilization of existing records and ensuring the quality of data.

Every student of social work at post graduation level must have adequate knowledge and information on data collection. This will be of great use at some point of time as a social work, teacher or practitioner.

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UNIT 1 METHODS OF SAMPLING

Structure

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Concept of Population and Sample
- 1.3 Methods of Sampling
- 1.4 Choice of the Sampling Method
- 1.5 Characteristics of a Good Sample
- 1.6 Determination of Sample Size
- 1.7 Let Us Sum Up
- 1.8 Glossary
- 1.9 Check Your Progress: The Key
- 1.10 Further Readings and References

1.0 OBJECTIVES

On the completion of this Unit, you should be able to:

- define the terms population and sample;
- describe the steps in the sampling process and the various methods of sampling;
- define a probability sample and describe the various types of probability sample;
- define a non-probability sample and describe the various types of non probability sample; and
- describe the characteristics of a good sample.

1.1 INTRODUCTION

We collect data in order to make generalisation. For example, ‘Are professional social workers today more progressive than they were in nineties?’ Question of this kind calls for generalisation. But only rarely does a study include observations of all respondents that are defined by the research problem. A familiar example is the elections. To predict the outcome of the elections, pollster interviews a subset of the total electorate and predicts the behaviour of the entire set (the electorate or population). Similarly, suppose that, as a researcher, you want to study the effects of social work intervention on HIV/AIDS patients in your city. For this, you do not have to select all the HIV/AIDS patients in your city. Instead, you may select a few patients from your city and assess the effects of the programme. The process of selection demands thorough knowledge of various sampling methods. In this chapter, we shall familiarize you with the concepts of sample and population. We shall also discuss the characteristics of good sample and various methods of sampling.

1.2 CONCEPT OF POPULATION AND SAMPLE

Sometimes it is not feasible to study a whole group or an extremely large group. For example, social work researchers might be interested in learning about the mentally challenged children, mentally ill, prison inmates, street children or some other large group of people. It would be difficult rather impossible to study all members of these groups. Here comes a process called *sampling* which allows us to study a manageable number of people from the large group to derive inferences that are likely to be applicable to all the people of the large group.

Another reason why we should study a sample is, the results obtained from a sample are more precise and correct than the results from the study of the whole group. Cost involved in studying all units of a large group is yet another factor which suggests us to study a small group of people instead. Associated with cost, there are certain other factors such as time available for the study and accessibility of the units of study. Above all, the point to be kept in mind is, if we can get results of almost same dependability by studying a carefully selected small group of people why should we study the large group at all.

A single unit of study is referred to as an element of population. When we select a group of elements for studying a particular phenomenon, we refer to that group of elements as a *sample*. The aggregate of all the elements that conform to some defined set of definitions is called population. Thus, by the term college students of a city we define a population consisting of all the students studying in various colleges of the city. We may similarly define populations consisting of all the mentally challenged children in the city, all the women workers in a particular slum in a city, all the child workers in a given community less than sixteen years of age who work in hotels, or all the case records in a file. A single unit of a population is referred to as an element of the population. To get the desired information, generally, we study some of the elements rather than all. It is generally much more economical in time, effort and money.

By the logic of sample selection, it is presumed that the results obtained from the sample are true of the total population of the universe as a whole. In reality, this may or may not be true. How closely the sample statistics correspond to the population depends largely on the way the sample is selected. (Kidder, 1981)

For instance, suppose we want to know what percentage of a population agrees with a statement: "Child labour should be banned". We might put the statement to a sample, compute the percentage of those who agree with the statements, and take this result as an estimate of the percentage of the population who agrees. We can devise a sampling plan that will carry the assurance that our sample estimates will not differ from the corresponding true population parameters by, say, more than five percent; the estimates will be correct within the limit of five per cent (commonly known as "margin of error" or "limit of accuracy") 95 per cent of the time (commonly termed as the "probability" or "confidence level"). We can similarly employ another sampling procedure, which will produce results within the limits of one per cent 99 per cent of the time.

The sampling procedures, which ensure that the sample statistics will be correct within certain limits, are referred to as a "representative sampling plan." Here the usage of the word "representative" does not qualify sample, but sampling plan. A representative sampling plan ensures that the selected sample is sufficiently

representative of the population to justify our running the risk of taking it as representative. (Kidder, 1981).

Based on this assumption, probability sampling makes it possible to select a sample which will be representative. This helps researchers to estimate the extent to which the sample statistics are likely to differ from population parameters. This means, if probability sampling method is used, it is possible to ascertain the size of the sample that will be needed if we want to have a given degree of accuracy that their sample results do not differ by more than a specified value from those of the population parameters.

There are a number of sampling techniques which decrease the likelihood of misleading generalisations based on sample statistics. These techniques assure the inclusion of diverse elements of the population in the sample by controlling the proportions of the various types of elements. Alternatively, statistical procedures are used in the analysis of the data.

Another important factor, which affects the representativeness of samples, is data collection procedures used in the study. This is the reason why the sample study of a large population can, in practice, produce more valid and reliable results than can a census. For instance, it is always difficult to get skilled interviewers in large numbers to cover wide-spread area of study. Even if we manage to get required number of skilled interviewers, it is not possible to get anything beyond the most superficial data in a census study. Moreover, the reliability of such data is also not beyond doubts. On the contrary, in a sample study, which requires lesser number of skilled interviewers, not only can we probe thoroughly by spending more time with each respondent but can also depend on the quality of data collected. In addition to this, a sample study reduces the large expenses required for a census study to a large extent.

Thus a “sample” is a miniature representation of and selected from a larger group or aggregate. In other words, the sample provides a specimen picture of a larger whole. This larger whole is termed as the “population” or “universe”. In research, this term is used in a broader sense; it is a well defined group that may consist of individuals, objects, characteristics of human beings, or even the behaviour of inanimate objects, such as, the throw of a dice or the tossing of a coin.

Suppose there are 60 wards in your city and we include all the wards in our study, it would not only be expensive but also cumbersome and time consuming. So, we select a few wards. The selected wards are termed as constituting a sample. The total number of wards is called ‘population’ or ‘universe’. This process of selecting few wards is known as sampling.

Representativeness and Adequacy

Basically, there are two requirement of a sample: it has to be ‘representative’ and adequate. If the nature of the population has to be interpreted from a sample, it is necessary for the sample to be truly representative of the population. Moreover, it calls for drawing a representative ‘proportion’ of the population. The population may contain a finite number of members or units. Sometimes, the population may be ‘infinite’. Therefore, a population has to be defined clearly so that there is no ambiguity as to whether a given unit belongs to the population or not. Otherwise, a researcher will not know what units to consider for selecting a sample.

The second issue related to the representation of a sample is to decide about the 'sampling frame', i.e., listing of all the units of the population in separate categories. In a study, there can be different sampling frames, such as male/female students, employed/unemployed students, etc. The sampling frame should be complete, accurate and up-to-date, and must be drawn before selecting the sample.

Thirdly, a sample should be unbiased and objective. Ideally, it should provide all information about the population from which it has been drawn. Such a sample based on the logic of induction, i.e., proceeding from the particular to the general, falls within the range of random sampling errors. This leads us to the results expressed in terms of "probability".

A sample should not only provide representativeness, but should also be adequate enough to render stability to its characteristics. What, then, is the ideal size of a sample? An adequate sample is the one that contains enough cases to ensure reliable results. If the population under study is homogenous, a small sample is sufficient. However, a much larger sample is necessary, if there is greater variability in the units of population. Thus the procedure of determining the sample size varies with the nature of the characteristics under study and their distribution in the population. Moreover, the adequacy of a sample will depend on our knowledge of the population as well as on the method used in drawing the sample.

Check Your Progress 1

1) Define Sampling.

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1.3 METHODS OF SAMPLING

In the previous section, we suggested that the method used for drawing a sample is significant to arrive at dependable results or conclusions. With this fact in view, here in this section, we shall now talk about the various sampling methods. Sampling methods can be broadly classified into two categories:

- i) Probability Sampling, and
- ii) Non-probability Sampling.

Probability Sampling

Probability sampling is based on random selection of units from a population. In other words, the sampling process is not based on the discretion of the researcher but is carried out in such a way that the probability of every unit in the population of being included is the same. For example, in the case of lottery, every individual has equal chance of being selected. Some of the characteristics of a probability sample are:

- i) each unit in the sample has equal probability of entering the sample,
- ii) weights appropriate to the probabilities are used in the analysis of the sample, and
- iii) the process of sampling is automatic in one or more steps of the selection of units in the sample.

Probability sampling can be done through different methods, each method having its own strengths and limitations. A brief account of these is given below:

Simple Random Sampling

Simple random sampling is a method of selecting a sample from a finite population in such a way that every unit of population is given an equal chance of being selected [see item (I) above]. In practice, you can draw a simple random sample unit by unit through the following steps:

- i) Define the population.
- ii) Make a list of all the units in the population and number them from 1 to n .
- iii) Decide the size of the sample or the number of units to be included in the sample.
- iv) Use either the 'lottery method' or 'random number tables' to pick the units to be included in the sample.

For example, you may use the lottery method to draw a random sample by using a set of 'n' tickets, with numbers '1 to n' if there are 'n' units in the population. After shuffling the tickets thoroughly, the sample of a required size, say x , is selected by picking the required x number of tickets. The units which have the serial numbers occurring on these tickets will be considered selected. The assumption underlying this method is that the tickets are shuffled so that the population can be regarded as arranged randomly. Similarly, to select five wards from the total number of wards (60 wards) in the city you will write the serial numbers of all the wards on small pieces of paper, jumble the chits as well and then choose five numbers.

The best method of drawing a simple random sample is to use a table of random numbers. These random number tables have been prepared by Fisher and Yates (1967). After assigning consecutive numbers to the units of population, the researcher starts at any point on the table of random numbers and reads the consecutive numbers in any direction horizontally, vertically or diagonally. If the read out number corresponds with the one written on a unit card, then that unit is chosen for the sample.

Let us, suppose that a sample of 5 wards is to be selected at random from a serially numbered population of 60 wards. Using a part of a table of random numbers reproduced here, five two digit numbers (as the total population of Blocks 60, is a two-digit figure) are selected from Table given below.

Table 1.1 : An Abbreviated Table of Random Numbers

Row							
Column	1	2	3	4	5	...	N
1	2315	7548	5901	8372	5993	...	6744
2	0554	5550	4310	5374	3508	...	1343
3	1487	1603	5032	4043	6223	...	0834
4	3897	6749	5094	0517	5853	...	1695
5	9731	2617	1899	7553	0870	...	0510
6	1174	2693	8144	3393	0862	...	6850
7	4336	1288	5911	0164	5623	...	4036
8	9380	6204	7833	6280	4491	...	2571
9	4954	0131	8108	4298	4187	...	9527
10	3676	8726	3337	9482	1569	...	3880
11	...	...	...	..	...	....	...
12	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...
15	...	....	...	...	...	...	...
n	3914	5218	3587	4855	4881	...	5042

If you start with the first row and the first column, 23 is the first two-digit number, 05 is the next number and so on. Any point can be selected to start with the random numbers for drawing the desired sample size. Suppose the researcher selects column 4 from row 1, the number to start with 83. In this way he/she can select first 5 numbers from this column starting with 83.

The sample, then, is as follows:

83 75
 53 □ 33 □
 40 □ 01 □
 05 □ 26

Now, in selecting the sample of 5 wards, two numbers, 83 and 75, need to be deleted as they are bigger than 60, the size of the population. The processes of selection and deletion are stopped after the required number of five units gets selected.

The selected numbers are 53, 40, 05, 33, and 01. If any number is repeated in the table, it may be substituted by the next number from the same column. The researcher will go on to the next column until a sample of the desired size is obtained.

Simple random sampling ensures the best results. However, from a practical point of view, a list of all the units of a population is not possible to obtain. Even if it is possible, it may involve a very high cost which a researcher or organisation may not be able to afford. Therefore, simple random sampling is difficult to realize. Also, in case of a heterogeneous characteristic of the total population, even though all selected units participate in the investigation. An efficient alternative to random sampling in which every Xth element in the sampling frame list-after a random start - is chosen for inclusion in the sample.

Systematic Sampling

Systematic sampling provides a more even-spread of the sample over the population list and leads to greater precision. The process involves the following steps:

- i) Make a list of the population units based on some order – alphabetical, seniority, street number, house number or any such factor.
- ii) Determine the desired sampling fraction, say 50 out of 1000; and also the number of the K^{th} unit. [$K = N/n = 1000/50 = 20$].
- iii) Starting with a randomly chosen number between 1 and K , both inclusive, select every K^{th} unit from the list. If in the above example the randomly chosen number is 4, the sample shall include the 4th, 24th, 44th, 64th, 84th units in each of the series going up to the 984th unit.

This method provides a sample as good as a simple random sample and is comparatively easier to draw. If a researcher is interested to study the average telephone bill of an area in his/her city, he/she may randomly select every fourth telephone holder from the telephone directory and find out their annual telephone bills. However, this method suffers from the following drawbacks because of departure from randomness in the arrangement of the population units.

i) Periodic Effects

Populations with more or less definite periodic trends are quite common. Students' attendance at a residential university library over seven days in a week, sales of a store over a twelve months in a year and flow of road traffic past a particular traffic point on a road over 24 hours are a few examples to show periodic trend or cyclic fluctuation in a given population. In such cases systematic sample may not represent the population adequately or remain effective all the time.

ii) Trend

Another handicap of systematic sampling emerges from the fact that very often 'n'

is not an integral multiple of 'k'. This leads to a varying number of units in the sample from the same finite population.

Suppose a population of 100 beneficiaries is listed according to seniority and a researcher wants to select a sample of 20. First he/she divides 100 by 20 to get 5 as the size of interval. Suppose he/she picks 4 at random from 1 to 5 as a starting number. Then, he/she selects each 5th name at 9, 14, 19,until he/she draws the desired 20 names. If he/she picks 2 as the starting point, next sample units would be 2, 7, 12, In the latter sample each beneficiary's seniority is lower than his/her counterpart in the former sample. The mean average of these two samples would be significantly divergent as regards seniority and other associated variables. Many such samples can be drawn by taking different starting points but there will be greater variation among them.

Thus, the 'periodic effects' and 'trend' of the listed population unduly increase the variability of the samples, and calculations made from such samples cannot show the sources of variability. The main advantages of systematic sampling are:

- a) It involves simple calculations.
- b) It is less expensive than random sampling.

Stratified Sampling

Stratified random sampling takes into account the stratification of the main population into a number of sub-populations, each of which is homogenous with respect to one or more characteristic(s). Having ensured this stratification, it provides for selecting randomly the required number of units from each sub-population or any mode of selection. The steps involved in the stratified sampling are given as follows:

- i) Deciding upon the relevant stratification criteria such as sex, geographical region, age, courses of study, etc.
- ii) Dividing the total population into sub-population based on the stratification criteria.
- iii) Listing the units separately in each sub-population.
- iv) Selecting the requisite number of units from each sub-population by using an appropriate random selection technique.
- v) Consolidating the sub-samples for making the main sample.

Thus, stratification improves the representativeness of a sample by introducing a secondary element of control. However, the efficiency of the stratified random sample depends on the allocation of sample size to the strata. Rendering proportional weightage to each criterion improves it further by allowing the use of a smaller sample and by helping in achieving higher efficiency at a reduced cost.

Stratified random sample is very useful when lists of units or individuals in the population are not available. It is also useful in providing more accurate results than simple random sampling. For example, while selecting a sample of undergraduate student of the Open University in your country, the researcher may divide the whole population of undergraduate students as constitutive of males and

females, of those drawn from north, east, south, and west regions of the country. All these will be different strata. From each stratum researcher may select 50 students as a sample.

Sometimes stratification is not possible before collecting the data. The stratum to which a unit belongs may not be known until the researcher has actually conducted the survey. Personal characteristics such as sex, social class, educational level, age etc., are examples of such stratification criteria. The procedure in such situations involves taking a random sample of the required size and then classifying the units into various strata. The method is quite efficient provided the sample is reasonably large, i.e., more than 20 in every stratum.

Proportionate Stratified Random Sampling

In the sampling plan the sample will have specified characteristics in exact proportion to those characteristics which are distributed in the population. To understand this sampling plan we will consider the following example.

Let us consider the students of college of social work. The researcher wishes to have proportionate stratified random sample of them taking year of study in the college as the basis of stratification. Let us suppose that the students at this college are distributed as is shown in given Table.

Table 1.2 : Distribution of Students According to Year in College

Year	Population	Proportion of each class
BSW I	50	.25
BSW II	40	.20
BSW III	30	.15
MSW I	40	.20
MSW II	40	.20
Total	200	1.00

Further, we suppose that the researcher decides to have a sample of 60 students. First, he determines the proportion of students in each class (as shown in the second column). Then he calculates the composition of the sample taking each proportion of the stratifying characteristics in the population and multiplying it by the desired size of the sample. Thus, he multiplies 60, the desired sample size by .25, the proportion of BSW first year students in the population or $(60) (.25) = 15$

As such, he has to include 15 students from the BSW first year in his sample. This precedence is repeated for each year as described below: $(60) (.25) = 15$, $(60) (.20) = 12$, $(60) (.15) = 9$, $(60) (.20) = 12$, $(60) (.20) = 12$ **Sample Size (N) = 60**

Table 1.3 : Distribution of Students by Proportion

Year	Sample Break-up	Proportion
BSW I	15	.25
BSW II	12	.20
BSW III	9	.15
MSW I	12	.20
MSW II	12	.20
Total Sample (n) =	60	1.00

After having determined the sample size from each sub-category, the researcher uses simple random sampling for drawing the desired number of elements from each category.

Disproportionate Stratified Random Sampling

This sampling plan is almost similar to proportionate stratified random sampling except that the sub samples are not necessarily distributed according to their proportionate weight in the population from which they were drawn. It is possible that some sub samples are over represented while other sub groups are under represented.

Let us suppose that the researcher stratifies the population into two sub strata using sex as the criteria. He would get, the following break-up of the population:

Table 1.4 : Distribution of Students by Sex

Sex	No. of Students	Percentage
Male	160	80
Female	40	20
Total	200	100

If the researcher wants to draw a disproportionate stratified random sample of 60 from this population, stratified by sex, then he has to draw 30 from each substrata, this means male students (30) will be under- represented and female students (30) will be over represented in the sample. In other words disproportionate sampling gives equal weights to each substratum.

Cluster Sampling

In case the area of study is markedly wide-spread, large expenses are involved if simple and stratified random samplings are used. For example, in the preparation of sampling frame from the population and in covering the widespread areas by interviewers a large amount of expenditure is required. The more widely spread the area of study, the greater are the travel expenses, the greater is the time spent in traveling, and hence expensive-and the tasks of administering, monitoring and supervision of the research project and in particular supervising the field staff become more complicated. Cluster sampling may be used when it's either impossible or impractical to sample an exhaustive list of the elements that make up the target

population. For the reasons mentioned above and few other reasons, large scale research studies make use of the methods of cluster sampling.

In cluster sampling, first the whole research area is divided into sub areas, more commonly known as “clusters”. The simple random or stratified method is used to select clusters. Finally, researcher arrives at the ultimate sample size to be studied by selecting sample from within the clusters which is carried out on a simple or stratified random sampling basis.

Let us suppose, for example, that we want to do a survey of beggars in urban areas of a state. We may proceed as follows: prepare a list of districts and group them into clusters, and then select a simple or stratified random sample from each cluster. For each of the districts included in the sample, list the cities/towns and take a simple or stratified random sample of them. If some or all of the towns/cities thus selected for the sample have more number of beggars can be studied, we may take a sample of these towns/cities in each district. The questionnaires may then be administered to all the beggars in these towns/cities or, if it is desirable and administratively feasible to do so, to a sample of the beggars.

Characteristically, the procedure moves through a series of stages-hence the common term, “multistage” sampling-from more inclusive to less inclusive sampling units until we finally arrive at the population elements that constitute the desired sample.

Random Selection – Representativeness & Probability of Selection

The reason for using simple random sampling selection methods are two fold. First, this procedure serves as a check on conscious or unconscious bias on the part of the researcher. The researcher who selects cases on an intuitive basis might very well select cases that would support his/her research expectations or hypothesis. Random selection eases this danger.

More important, random selection offers access to the body of probability theory, which provides the basis for estimating the characteristics of the population as well as estimates of the accuracy of samples.

Probability Sampling in Review

CE Probability sampling avoids conscious or unconscious biases in element selection on the part of the researcher. If all elements in the population have an equal (or unequal & subsequently weighted) chance of selection then there is an excellent chance that the selected sample will closely represent the population of all elements.

CE Probability sampling permits estimates of sampling error. Although no probability sample will be perfectly representative in all respects, controlled selection methods permit the researcher to estimate the degree of expected error.

Non-probability Sampling

Non-probability sampling is based on the judgement of the researcher. The guiding factors in non-probability sampling include the availability of the units, the personal experience of the researcher and his/her convenience in carrying out a survey. Since these samples are not prepared through random sampling techniques, they are known as non-probability samples. Depending on the technique used, non-probability samples are classified into accidental, quota and purposive samples. A brief description of these samples is given below.

Accidental Sampling

Accidental sampling refers to a method of selecting respondents who happen to meet the researcher and are willing to be interviewed. Thus, a researcher may take the first hundred people he meets who are willing to be interviewed.

For example, let us consider the situations where a programme director, wishes to make some generalisation about the programme in progress, selects beneficiaries who have come to the agency for a service or a community organiser, trying to know how “the people” feel about the status of health in that community, interviews available community members like shop-keepers, daily wage earners, barbers and others who are presumed to reflect public opinion. In both the situations those who are available for study are included in the samples. This is exactly what we call *accidental sampling*. It is very obvious that the sample so collected are biased and there is no known way (other than by doing a parallel study with a probability sample) of evaluating the biases introduced in such samples. However, in the situation illustrated above, most probably, accidental sampling is the only way out because of the reason that the population parameters of the beneficiaries or the community people are not available with the researcher.

Quota Sampling

Quota sampling ensures inclusion of diverse elements of the population in the sample and make sure that these diverse elements take account of the proportions in which they occur in the population. For example, we take a sample from a population with equal number of boys and girls. And that there is a difference between the two groups in the characteristic we wish to study but we fail to interview any girls. The results of such a study would almost certainly provide us with extremely misleading generalisations about the population. In practice, elements in small numbers are frequently under represented in accidental samples. In anticipation of such possible exclusion of small groups, *quota sampling* ensures inclusion of enough cases from each stratum in the sample. It should be noted here that the major goal of quota sampling is the selection of a sample that is a replica of the population to which one wants to generalise.

Hence it should be clear that the critical requirement in quota sampling is not that the various population strata be sampled in their correct proportions, but rather that there be enough cases from each stratum to make possible an estimate of the population stratum value (Kidder, 1981, p.426). Quota-sampling, however, is more or less similar to the earlier described accidental sampling procedure except that it ensures the inclusion of diverse elements of the population.

Purposive Sampling

Purposive sampling is based on the presumption that with good judgment one can select the sample units that are satisfactory in relation to one's requirements. A common strategy of this sampling technique is to select cases that are judged to be typical of the population, in which one is interested, assuming that errors of judgment in the selection will tend to counterbalance each other. For example, if a researcher were conducting a study of patients who are not regular in attending out-patient department, it might be desirable to choose patients for the sample from among those who are frequently irregular. Because, the causes of irregularity can be described by irregular patients only. If he selects a random sample he would have got patients who are regular and that might influence the findings of

the study. It is also possible that in a truly random sample, the regular patients would nullify the effects of irregular patients. Researcher conducting qualitative studies are often particularly interested in studying deviant cases – cases that don't fit into fairly regular patterns of attitudes & behaviours – in order to improve their understanding of the more regular pattern. This approach is called Deviant Case Sampling and it is another form of purposive sampling.

Snowball Sampling

Snowball sampling is externally helpful in studying some special sampling situation like getting a sample of drug abusers, or alcoholics or pickpockets. In snowball sampling we start with a few respondents of the type we wish to include in our study, who in turn are expected to guide us to get more respondents and so on. Like the rotating snowball, sample increases in its size as we continue to get more units of study. The technique is especially useful in the investigation of sensitive topics mentioned above because this sampling technique depends on sampled cases having knowledge of other similar cases. Another argument in favour of using this sampling technique is that, the victims might be hesitant to identify themselves if approached by a stranger but might be friendly to someone whom they know and share their experiences with (Gelles, 1978).

Special Applications of Non-probability Sampling

In general, the major advantages of non-probability sampling are convenience and economy. However, in social work research, most often we have no option other than non-probability sampling. For example, a social worker who is interested to study why cancer out-patients are not regular in reporting to the doctor or what are the problems of the parents of the mentally challenged children and the like, will have to use any one of the non-probability sampling plans. It is likely, therefore, that many sampling operations in social work research will be conducted according to non-probability principles. Social work researchers are convinced that these sampling procedures work reasonably well, despite the fact that they do not provide any basis for estimating how far the sample results are likely to deviate from the true population figures. Social work researchers, in other words, will continue to use non-probability methods and to justify their use on the grounds of practical experience, even while conceding the representativeness in principle of probability sampling. Moreover, many researchers argue that, many a time, this so-called representativeness exists only on paper. They believe that there is a difference between the sampling plan and its actual implementation; there can be many a slip in the implementation of the plan, which would nullify its theoretical merits.

For example, in situations where investigators may fail to follow the instructions in selecting respondents, or some of the selected respondents may refuse to be interviewed or not be available, investigators are allowed to substitute other respondents when those selected for the sample are not available for interview. Truly speaking, the sample thus obtained hence may not be the probability sample as it was planned to be.

In fact, there are situations in social work practice, in which probability sampling is unnecessary or inappropriate. One such situation arises from the fact that many a time, social work researchers do not necessarily carry out studies of samples only for the purpose of generalisation to the populations from which samples have

been drawn. If samples are used for other reasons, ability to evaluate the likelihood of deviations from the population values is irrelevant.

For example, a social worker who wants to study the problems of parents of mentally challenged children would be interested in obtaining ideas, good insights and critical appraisals rather than assessing the status of opinion among the parents. In this situation researcher has to select a non-probability sample most probably a purposive sample. The situation is almost exactly analogous to one in which a social worker tries to evaluate the effectiveness of a new technique of educating alcoholic patients. The alcoholics-also a purposive sample-are not called in order to get an average opinion that would correspond to the average opinion of the entire alcoholic population. They are called in precisely because of their special problems.

Another example of sampling is for diagnosing the problems of a group of delinquent children rather than for the estimation of population values may be provided by the single subject research known as evaluative research. The typical problem of evaluative research is to find out something about motives, attitudes, and associations that are evoked by certain social conditions, but that may not be obvious even to the respondents themselves. The results of such studies are reported to agencies, which make use of them in developing treatment plans for their inmates. Interestingly, the evaluative researchers are quite happy with accidental samples, or with purposive samples selected in such a way as to maximize the likelihood of differences among the elements in the sample. They are looking for causative factors to transmit to the agency people, not for correct estimates of population distributions.

Combinations of Probability and Non-probability Sampling

If sampling is carried out in a series of stages, it is, of course, possible to combine probability and non-probability sampling in one design. That is, one or more of the stages can be carried out according to probability sampling principles and the remaining by non-probability principles.

The investigators may select clusters by probability cluster-sampling techniques, but, at the final stage, select the elements as a quota sample. Thus, it is possible to select a probability sample of districts in a state, within each of these districts, a probability sample of towns: and within each of the selected towns, a quota sample controlled for say, age and sex.

The advantage of such a design is the cost of obtaining cases for the sample. It is relatively inexpensive to select the areas within which the final stage of sampling will take place by probability sampling, and we thereby gain the advantages of probability sampling, at least for the areas. There is some evidence, for instance, that quota samples built up in selected areas are more successful in controlling such variables as socio-economic status than quota samples in which the control of these variables depends on the judgments of the interviewers (Kish, 1965).

The second example of combining probability and nonprobability sampling involves the opposite strategy. The investigator takes a probability sample of elements within a non-probability sample of areas. The areas are selected as a purposive sample. For example, a number of districts may be selected on the grounds that they have lower rate of literacy. Within each of the "typical" districts, the investigator selects a probability sample of respondents.

Social work researchers do not, generally, engage in sampling process like those used for conventional research process. Yet, the process of sampling in social work practice is based on principles of sampling discussed in this chapter. Though the needs and characteristics of the clientele groups typically guide the evaluations of social work programmes, the inferences about the client's problems are guided by research principles.

In social work practice setting, most of the times, it is unlikely that we use probability sampling. Irrespective of whether one's clients are mentally challenged children, delinquent children, street children, abused children or drug addicts we have no way of knowing whether all people with such characteristics had a chance to be in our sample. That much, we are most likely to deal with non-probability samples with their limitations. Most often, we have people who have happened to come to our agency to have our services. As such, social work researchers have to be careful while making generalisations about the findings. Nevertheless, there is no reason to despair. One simply has to keep in mind the limitations of non-probability samples and use care in generating the required sample (Monette, et. al. 1986).

1.4 CHOICE OF THE SAMPLING METHOD

The choice of sampling method depends on several considerations unique to each individual project. These include issues related to the definition of population, availability of information about the structure of the population, the parameters to be estimated, the objectives of the analysis including the degree of precision required, and the availability of financial and other resources. This calls for appropriate selection of a sample for the conduct of any research study.

1.5 CHARACTERISTICS OF A GOOD SAMPLE

A good sample should have the characteristics of (i) Representativeness and (ii) Adequacy.

It is essential that the sample should be 'representative' of the population if the information from the sample is to be generalized for that population. The term representative sample means an ideal 'miniature' or 'replica' of the population from which it has been drawn.

A good sample should also be 'adequate' or of sufficient size to allow confidence in the stability of its characteristics. An adequate sample is considered to be one that contains enough cases to ensure reliable results. Hence, planning the size of the sample in advance is very important. It varies with the nature of the characteristics under study and its distribution.

It may be mentioned that representativeness and adequacy do not automatically ensure accuracy of results. The sampling and data collection techniques need to be selected and employed carefully to obtain higher degrees of precision in results and generalizations about the population.

1.6 DETERMINATION OF SAMPLE SIZE

Most researchers find it difficult to determine the size of the sample.

Krejcie and Morgan (1970) have given a table in which no calculations are needed to determine the size of the sample. The table is reproduced here for the facilities of all of you.

Table for Determining Sample Size from a Given Population

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	396
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	341
N	S	N	S	N	S
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	361
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note: N is population size, S is the required sample size

Let us take one example. If you want to know the sample size required to be representative of the opinions of 300 beneficiaries, refer table at N=300. The sample size representative of the beneficiaries in this case will be 169. The table given above is applicable to any defined population.

Check Your Progress 3

1) Describe the various types of non-probability sample

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2) Discuss the characteristics of a good sample.

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1.7 LET US SUM UP

A population is a well-defined group of units: individuals, objects, attributes, qualities, characteristics, traits of human beings, etc. A sample is a small representation of a population. It is a miniature picture of the entire group from which it has been selected. To obtain a representative sample, you must select the unit in a specified way. This process is called sampling. It usually involves the following four steps: (i) Defining the population; (ii) Listing the population; (iii) Selecting a representative sample, and (iv) Obtaining an adequate sample.

Sampling methods can be classified into two broad categories: (i) Probability sampling and (ii) Non-probability sampling.

In *probability sampling*, the units of the population are not selected at the discretion of the researcher but by means of certain procedures which ensure that every unit of population has the same probability of being included in the sample.

Simple or unrestricted random sampling, systematic sampling, stratified sampling, cluster sampling, multi-stage sampling and probability proportion to size sampling are the six main types of probability sampling. In all these types each unit in the sample has some known probability of entering the sample. In simple or unrestricted random sampling each unit of the population is given an equal chance of being selected, and the selection of any one unit is in no way tied to the selection of any other. The law of chance is allowed to operate freely in the selection of such samples and carefully controlled conditions are created to ensure that each unit in the population has an equal chance of being included in the samples. The researcher may use the lottery method or a table of random numbers for drawing a simple

random sample. Simple random sampling ensures best results. However, it is neither feasible nor possible if the lists of units do not exist or if such lists are incomplete. If there is more heterogeneity among the units of population, a simple random sample may not necessarily represent the characteristics of the total population even if all selected units participate in the investigation.

In *systematic sampling*, a researcher generally starts with a list in which all the N units of the population are listed in alphabetical or in any other order. To select a sample of size n , the researcher has to select a unit at random from the first $k = (N/n)$ units of the list and then every subsequent k^{th} unit is selected. A systematic sample is as good as a simple random sample and is comparatively more convenient to draw. However, the characteristics of “trend”, “cyclical fluctuations” and “periodic effects” of a listed population unduly increase the variability of samples.

When the units in a sample are proportional to their presence in the population, the sampling is said to be stratified. When a population is stratified, the units within each stratum are more or less homogeneous than the units within the entire population. Stratified random sampling is very useful when lists of units in the population are not available. The method has been found practical even for small finite populations when cent percent response is difficult to secure within the desired time. Stratified random sampling provides more accurate results than simple random sampling only if stratification results in greater homogeneity within the strata than in the whole population taken as one unit. It is particularly useful in opinion survey studies. When the units vary in size, it is better to select a sample in which the probability of selection of a unit is proportional to its size. This sample is known as proportionate stratified sample.

Cluster sampling is used when the population under study is infinite, where a list of units of the population does not exist, when the geographical distribution of units is scattered, or when sampling of individual units is not convenient for various practical purposes. Cluster sampling involves division of the population of elementary units into groups of elements or clusters instead of individual members or items in the population. Cluster sampling is economical, especially when the cost of measuring a unit is relatively small and cost of reaching it is relatively large.

Non-probability sampling is based on the judgement of the researcher. Its guiding principles are: (i) availability of sampling units, (ii) personal experiences of the researcher, and (iii) the researcher’s convenience in conducting the research. Since this type of sampling does not involve the principle of probability, it is called non-probability sample. Non-probability sampling provides (i) *purposive* samples, (ii) *incidental* samples, and (iii) *quota* samples.

A purposive sample is arbitrarily selected because there is good evidence that it is a representative of the total population. The evidence is based on researcher’s experience. An incidental sample is generally used with those groups which are selected because of the easy or ready availability of sample units.

A quota sample involves selection of the sample units within each stratum or quotas on the basis of the judgement of the researcher rather than on calculable chance of being included in it.

Non-probability samples are very convenient in situations where the sample to be selected is very small and the researcher wants to get some idea of the characteristics of a population in a shorter time. Non-probability samples have

certain limitations. No valid generalisations can be made beyond the sample studied. These samples depend exclusively on uncontrolled factors and the researcher's insight. Hence, the sampling error of such samples is hardly determinable.

The choice of an appropriate sampling method by a researcher depends upon many factors. These include (i) defining the population, (ii) availability of information about the structure of population, (iii) the parameters to be estimated, (iv) the objectives of the analysis, including degree of precision required, and (v) the availability of financial and other resources.

Representativeness and adequacy are the major characteristics of a good sample.

1.8 GLOSSARY

- Population** : A population is any group of individuals or units that have one or more characteristics in common and are of interest to the researcher. It may consist of all the units or individuals of a particular type or a more restricted part of that group.
- Sample** : A sample is a small proportion of a population selected for analysis. By observing the sample, certain inferences may be drawn about the population. Samples are not selected haphazardly, but deliberately, so that the influence of chance or probability can be estimated.
- Probability** : Probability is the ratio of the number of ways in which a favoured way can occur to the total number of ways the event can occur. It may range from zero, when there is no chance whatsoever, of the favoured event, to 1.0, where there is absolute certainty that nothing else could happen.
- Probability Sampling** : In probability sampling, the units of a population are not selected at the discretion of the researcher but by means of certain procedures which ensure that every unit of the population has one fixed probability of being included in the sample. It is a procedure of drawing the units of a population in such a way that every unit has an equal and independent chance of being included in the sample.
- Non-probability Sampling** : In non-probability sampling, the units are selected at the discretion of the researcher. The researcher uses his/her judgement or experience while selecting the sample.

- Sampling Frame** : A complete, accurate, and up-to-date list of all the units in population is called a sampling frame.
- Representative Sample** : A representative sample is one that matches with its corresponding population with respect to the Characteristics important for the research.
- Parameter** : Measures which describe a population are called parameters.
- Statistics** : The measures estimated from the samples are called statistics.
- Sampling Error** : The ‘statistics’ estimated from samples tend to differ more or less from sample to sample drawn from the same population due to sampling fluctuations. On the other hand, the ‘parameter’ is considered to have a fixed reference value. It is not possible to compute parameter but there is a statistical procedure to forecast the parameter from sample statistics provided certain conditions have been satisfied. The difference between the sample estimate (statistics) and the population value (parameter) is called the ‘sampling error’.
- Biased Sample** : A sample that is not representative is known as a biased sample. Biases may be due to imperfect tools or instruments, personal qualities of the researcher, defective techniques or other causes.

1.9 CHECK YOUR PROGRESS: THE KEY

Check Your Progress 1

Sampling is the process of selecting a sample which is a small representation of a larger whole or group. A sample should represent truly and adequately the larger whole. A sampling frame should be complete, accurate, up-to-date, unbiased and objective.

Check Your Progress 2

Sampling or unrestricted random sampling, systematic sampling, stratified sampling, cluster sampling, multi-stage sampling and probability proportion to size sampling (PPS) are the important types of probability sampling.

Check Your Progress 3

- a) Non-probability sampling includes (i) purposive sample, (ii) incidental sample and (iii) quota sample.

- Purposive sample is useful when we have to include a very small number of units in a given sample.
 - Incidental sample is generally applied in the case where units are easily or readily available.
 - Quota sample involves the selection of sample units within each stratum or quota on the basis of the judgement of the researcher. Sample units are not included accidentally or at random.
- b) A good sample must be
- representative of the population chosen
 - adequate and
 - accurate.

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UNIT 2 RESEARCH TOOLS: QUESTIONNAIRES, RATING SCALES, ATTITUDINAL SCALES AND TESTS

Structure

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Measurement in Social Research
- 2.3 Tools of Data Collection
- 2.4 Let Us Sum Up
- 2.5 Glossary
- 2.6 Check Your Progress: The Key
- 2.7 Further Readings and References

2.0 OBJECTIVES

On the completion of this Unit, you should be able to:

- state the use of scales used for measurement in social research;
- describe the characteristics of a good research tool;
- define a questionnaire and describe its various types;
- describe the characteristics, uses and limitations of a questionnaire;
- define a rating scale and describe its types, uses and limitations;
- define an attitude scale and describe its types, uses and limitations;
- define a test and describe the types, uses and limitations of tests; and
- choose appropriate tool and use them efficiently in your research project.

2.1 INTRODUCTION

One of the important stages of research process is data collection. In order to collect the requisite data for any type of research, you have to devise appropriate tools and use suitable measuring techniques, and decide on the relevant attributes of the samples drawn. There are several research tools, varying in design, operation, complexity of features, and interpretation. In certain situations, you may select from a list of available tools. In other situations, you may find that existing research tools do not suit your purpose or objective of research and, therefore, you may like to modify them or develop your own. Each tool is appropriate for collecting a particular type of data or information which lends itself to a particular type of analysis and interpretation for drawing meaningful conclusions and generalisations. For this, you need to familiarise yourself with the nature, merits and limitations of

various research tools. In this chapter we focus on the characteristics, types, uses and limitations of some commonly used research tools – questionnaires, rating scales, attitude scales and tests.

2.2 MEASUREMENT IN SOCIAL RESEARCH

The Concept of Measurement

The concept of measurement refers to the process of describing abstract concepts in terms of specific indicators by assigning numbers to these indicators in accordance with rules. Measurement of social phenomena has become an essential prerequisite because of a number of reasons. One of the important reasons for measuring social phenomena is to allow the researcher the opportunity of using these phenomena in hypotheses to determine the effects of a set of variables on others. (Black and Champion, 1976)

Let us consider the following hypothesis: “the adults who are lower in their self-esteem will tend to become chronic absentees in adult literacy classes than the adults with higher self-esteem” (a social psychological component of personality). Testing of this hypothesis needs a formal theoretical scheme where ‘self-esteem’ would be related systematically to ‘absenteeism’ in a causal fashion. One part of the testing process would consist of determining rank of absentees of the adults from the attendance records. We would match those adults with another group of adults selected randomly; from the same village who are regular in attending their classes. To ensure comparable samples of “absentees” and “regulars”, the groups could be matched according to several other characteristics such as age, sex, year of education, socio-economic background, education and occupation of parents and others.

Other part of testing of hypothesis requires assessment of socio-psychological variable ‘self-esteem’. How do we determine that a particular adult learner who is a chronic ‘absentee’ or ‘regular’ has more or less of this trait than the others? We cannot test the hypothesis mentioned above, until and unless we can quantify the variable ‘self-esteem’. To test the hypothesis it is essential that the variable ‘self-esteem’ is measured empirically. We must be able to say that adults vary according to this variable, and further more, we should specify the degree to which each adult possesses this variable. Only then we will be able to test our hypothesis. Measurement allows the researcher the opportunity of using variables in hypothesis to determine their effects on others.

Let us examine the following questions?

- 1) Do you save money? Yes/No, If yes, how much?
- 2) “Child labour in our country must be banned”.

Strongly Agree/Agree/Undecided/ Disagree / Strongly Disagree

The first question measures one aspect by determining the presence or absence of a characteristic ‘saving habit’ among child labour. The second question tries to measure in a more specific way involving the amount saved thus trying to determine the degree or intensity of saving. Finally, a reaction or comment to a statement is in a sequence of responses, which in turn can be converted into scores and would measure the phenomena in question more specifically.

Levels of Measurements

Social phenomena can be measured in various ways, such as by asking questions or noting/observing behaviour. Variables can be operationally defined at one or more of four levels of measurement; nominal, ordinal, ratio and interval. Level of measurement refers to a set of rules that defines permissible mathematical functions that can be performed on numbers/scores produced by a measure.

Nominal Level of Measurement

At the nominal level of measurement are defined in terms of qualitative attributes that are categorical only. For example: defining social adjustment in terms of whether a person is receiving social services (Yes/No) is at the nominal level of measurement. Other examples of variables at nominal level of measurement are - gender, ethnicity and birthplace. It makes no sense to assess how much a person is male or born in India. they either 'are' or they 'are not'.

Ordinal Level of Measurement

Variables at the ordinal level of measurement can be rank-ordered in that different attributes represents relatively more or less of the variable. But the differences between the attributes are not precise. At the ordinal level, we know only whether one case has more or less of something than another case, but we don't know how much more.

For example, customers say they are very satisfied with service 'A' but only slightly satisfied with service 'B', then we have an ordinal measure because we don't know the precise difference in degree of satisfaction.

Interval Level of Measurement

At the interval level of measurement, difference between different levels have the same meanings thus the difference between IQ scores of 95 and 100 is considered to be if the same magnitude as the difference between 100 and 105 IP social adjustment is defined in terms of a ..ractionors ruling of low medium, and hi. It is no longer at the nominal level, because the difference categories represent higher or lower degree of adjustment. However, it would not be at the interval level because of the difference between low, medium an dhigh are quite imprecise. It would be at the ordinal level because we cannot assume that the difference between low an dmedium is the same as the difference between medium and high.

Interval-level between the categories of measurement have equal spacing in addition to the characteristics of nominal level (mutually exclusive) and ordinal level (having fixed order). In interval measures the positions are not only ordered either in ascending order (lower, middle and higher) or in descending order (higher, middle and lower) but the intervals of measurement are also equal. In other words, the distance between the positions is equal, such as the degrees of a temperature scales. The examples of true interval scales are Fahrenheit and Celsius temperature scales. The units of measurement of both the scales are *degree* and are based on equal spacing characteristics of interval- level of measurement.

In an interval scale an equal distance between units will be found. That means, 2 has the same distance from 3 as 6 has from 5 and so on. For example, in thermometer having Celsius as unit of measurement, 60 degrees is 10 degrees more than 50 degrees. However, we cannot compare the ratios of two temperatures.

It would be erroneous to infer that 100-degree is twice as hot as 50 degrees. This is because, internal scale does not have an absolute zero.

Ratio Level of Measurement

Variables at the ratio level of measurement have the same attributes as interval measures but in addition have a true 'zero point'. Thus, a person can have no arrests, one arrest, two arrests and so on. Because there is a true zero point, we know the person with four arrests has been arrested exactly twice as many times as the person with two arrests.

For example, income can be measured at ratio level of measurement because it has an absolute zero (no income, at least in money terms, not in term of economic status). Hence, a person with monthly income of Rs. 1,500 has thrice as much as a person earning Rs. 500. Most of the function can be performed on data measurement on interval scales.

In social science research, we have very few measures clearly of interval level. One such measure that is relevant to social work is measurement of intelligence by intelligent quotient (IQ) tests. Units of measurement on IQ test are specific and each point on the scale is mutually exclusive. In addition, the distances between IQ scores of 90 and 100 and 100 and 110 are equal. However, since the zero point on the interval scale is arbitrary, we cannot say that a person with an IQ of 130 is twice as intelligent as a person with an IQ of 65.

Ratio level of measurement is the highest level of measurement. This level of measurement has all the characteristics of interval level of measurement except that the zero point is absolute in this case rather than arbitrary as in interval level of measurement. This means the ratio level of measurement contains the characteristics of nominal level of measurement (mutually exclusive) ordinal level of measurement (fixed order) and interval level of measurement (equal spacing, in addition to an absolute zero).

In social work research we rarely come across a situation where ratio level of measurement is warranted mostly because it is really difficult to arrive at absolute zero while measuring social phenomena. However, to understand the ratio level of measurement we will consider the measurement of income with which researchers are likely to deal with. Though there is considerable controversy on whether 'no income at all' can be considered as an absolute zero point of the scale, and whether there is equal spacing between the units. We will consider the measurement of income on this scale for the sake of better understanding.

Since the ratio level of measurement facilitates the equality of ratio, we can make statements like an income of Rs. 30,000 is thrice as much as Rs. 10,000 but only one-third as much as Rs. 90,000. However, one has to keep in mind that income, as ratio measure is only an indicator of the amount of money available to a person not as the measure of person's socio-economic status. For example, a difference between Rs. 1,00,000 and Rs. 1,10,000 does not necessarily indicate a change in socio-economic status equivalent to that between Rs. 20,000 and Rs. 30,000. It should be finally noted that the variables capable of being measured at high levels are always better than the variables capable of being measured at lower levels.

2.3 TOOLS OF DATA COLLECTION

Questionnaires, interviews, rating and attitude scales and tests are the major tools of data collection. In the following sections and sub-sections we shall discuss these research tools.

Questionnaire

‘Questionnaire’ is a commonly used tool for collecting a variety of data. A questionnaire may include a series of questions pertaining to psychological, social, educational or any such issues which are sent to an individual or a group, with the aim of obtaining relevant data on the topic of research.

Types of questionnaires

Questionnaires can be classified in various ways. Here, we confine ourselves to structured and unstructured questionnaires.

Structured questionnaires are those which pose definite, and concrete questions. These are prepared well in advance and not on the spot. Additional questions may be used only when there is a need to clarify vague or inadequate replies by respondents or when further details are needed. The form of questions may require responses which are either *closed* or *open-ended*.

Closed form of questionnaires are used when categorised data are required. They include a set of questions to which a respondent can reply in a limited number of ways—‘yes’, ‘no’, ‘no-opinion’, or an answer from a short list of possible responses. He/she is asked to put a tick (✓) mark in a space provided on the answer sheet or is requested to underline a response. Sometimes he/she is asked to insert brief answers of his/her own. The open-ended responses on the other hand are free and spontaneous expressions by the respondent to the questions posed to him/her. The open-ended responses are used mainly for intensive study of a limited number of cases or preliminary exploration of new problems and situations. At times, the respondent is asked to write a descriptive essay and express his/her viewpoints or report on details and events without restrictions imposed as in the case of closed questions.

Unstructured questionnaires are frequently referred to as interview guides. They also aim at precision and contain definite issues that are covered while conducting an interview. Flexibility is the chief advantage of the unstructured questionnaire. It is designed to obtain viewpoints, opinions, attitudes and to show relationships between various types of information which might escape notice under more mechanical types of interrogation. No predetermined responses are provided: instead, free responses are solicited.

Characteristics of a Good Questionnaire

The characteristics of a good questionnaire can be analyzed by its:

1) *Purpose*

A good questionnaire must serve two purposes. First, it must translate the objectives of an investigation into specific questions, the answers to which will provide the data necessary to test the hypotheses and explore the area defined by the objectives. Each question should relate the corresponding objective so that the response

obtained can be analysed and interpreted accordingly. The research objectives and specifications of the data required must precede the construction of questionnaire. Secondly, the questionnaire must motivate the respondents to communicate the required information. It is essential to include a courteous and carefully constructed covering letter to explain the purpose and importance of the study. The covering letter should assure the respondent that delicate information will be held in strict confidence.

2) *Language*

The language of a good questionnaire should be concise and directed towards producing uniformity of understanding among the respondents. The vocabulary should be simple and within the easy grasp of the least intelligent of the group under study. The syntax should be clear and straightforward. Vague phrases and expressions should be avoided. Technical expressions should be used only if the inquiry is directed to a select group which is well-versed in the technical language used. Proverbs and quotations should be avoided. Subjective words, such as 'bad', 'good', 'fair' and the like do not lend themselves to quantitative measurements nor qualitative analysis unless they are used for comparisons on a rating scale.

3) *Frame of Reference*

The respondent's frame of reference influences his/her answers. Complex questions that require the respondent to go through several steps of reasoning before answering are undesirable and have often resulted in misleading information. For example in a question like 'should study centers modernise their teaching', the word 'modernise' may have different connotations for different people.

Questions on controversial issues should be broken down into components, so that the researcher can determine the respondent's feeling about various aspects of the problem, including those which he/she refuses to comment upon. A series of specific questions is needed so as to uncover degrees of intensity of feeling or conviction. For example, questions to understand people's attitude towards the reservation policy have to be broken into issues like equality, equity, equal opportunities, etc.

The required answers should be within the informational domain of the respondents. For example a question 'Do you read 'Times'' may not bring the desired responses as many respondents may not know about this magazine. The length of the questions and statements used should be governed by a reliable estimate of the respondents' comprehension level.

4) *Sequence of Questions*

The arrangement or ordering of questions should receive special attention. It should appear logical to the respondents. The questions placed first in the questionnaire should be the easiest to answer. 'Interest-generating' questions should be asked at the beginning. A proper sequence of questions proceeds from the general to specific, from simple to complex one, from those that will create favourable attitude to those that may be somewhat delicate or sensitive.

5) *Length of the Questionnaire*

A questionnaire should not be longer than absolutely necessary. The

total number of questions must not be too large to tire or bore the respondents. If too many questions are asked and the respondent becomes tired, the questions at the end of the series may not be well answered. If it is necessary to include a large number of questions, it is advisable to have separate questionnaires.

6) *Form of Response*

The form in which the responses are recorded must be integrated with the form of the questions. There should be no hesitation in asking for responses in different forms in the same questionnaire, since it is frequently found that one form is better than another for questions about different aspects of the same subject. Questions requiring answers like “Yes” or “No” are subject to least bias. These responses are easy to tabulate. However, they do not always yield sufficient information on the subject under study. In such cases, the use of *multiple-choice responses* is desirable. Questions that present multiple choices to the respondent are effective when the choices are few and easy to follow.

Uses of Questionnaire

- 1) A questionnaire is a popular means of collecting different kinds of data in research. It is widely used in Social Work research to obtain information about certain conditions and practices and to inquire into opinions of an individual or a group.
- 2) A questionnaire is administered personally either individually or to a group of individuals or is mailed to them to save a great deal of time and money in travel. In the former situation, the person administering the tool has an opportunity to establish rapport with the respondents, to explain the purpose of the study to the respondents and to explain the meaning of questions which may not be clear to them. In the latter situation, mailed questionnaire is mostly used when the individuals cannot be contacted personally. The range of administration of a mailed questionnaire may be national even international.
- 3) Questionnaires are used both to initiate a formal inquiry and also to supplement and check data previously accumulated. They may pertain to studies of economic or social problems, measurement of opinion on public issues or events, studies of administrative policies and changes, studies on the cost of living, consumer expenditure, child welfare, and numerous other issues.

Limitations of Questionnaires

- 1) A questionnaire cannot be used with children and illiterates.
- 2) The return of the mailed questionnaires is often as low as 40 per cent to 50 per cent or it could even be lower than that. As a result of this poor response, the data obtained are sometimes of limited validity. The respondents who return the questionnaires may not be representative of the entire group. It will make the sample a biased one and thus vitiate the findings.
- 3) Sometimes respondents may not like to respond in writing to questions of intimate and confidential nature or to questions involving controversial issues. It is sometimes difficult to formulate the phrase questions on certain complex and delicate problems.
- 4) There is no check on the respondent who misinterprets a question or gives incomplete or indefinite response.

- 5) Sometimes the respondent may modify his/her earlier/original responses to the questions when he/she finds that his/her responses to latter questions are contradicting the previous ones.

Check Your Progress 1

- 1) Describe briefly the characteristics of a good questionnaire.

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Rating Scale

‘Rating’ is a term applied to an expression of opinion or judgement regarding some situation, object, character, or an attribute. ‘Rating scale’ refers to a ‘scale’ with a set of points which describe varying degree of an attribute under investigation.

Rating scales are broadly classified into five categories:

- i) numerical scales,
- ii) graphic scales,
- iii) standard scales,
- iv) rating by cumulative point, and
- v) forced choice ratings.

We discuss them below in the same order.

Numerical scales

In a typical numerical scale, a sequence of defined numbers is supplied to the rater or the observer. He/She assigns to each stimulus to be rated, an appropriate number in line with these definitions or descriptions of the event or the stimulus. For example, the following scale may be used in obtaining ratings of the affective values of colours:

- 1) Extremely pleasant
- 2) Moderately pleasant
- 3) Indifferent

- 4) Moderately unpleasant
- 5) Extremely unpleasant

The use of negative numbers is not favoured as those observers or raters who are not well versed in Algebra find it difficult to manage negative members.

Numerical rating scales are the easiest to be constructed. They are also the simplest in terms of handling the results. However, numerical scales have the limitations of biases.

Graphic Scales

The graphic scale is the most popular and the most widely used type of rating scale. In this scale, a straight line is shown, vertically or horizontally, with the various clues to help the rater. The line is either segmented into units or continuous. If the line is segmented, the number of segments can be varied from case to case. Given below is an example of such a scale.

How effective was the tutor in the class?

<i>Very</i>	<i>Slightly</i>	<i>Average</i>	<i>Slightly</i>	<i>Very</i>
Effective	Effective	Ineffective	Ineffective	

There are many advantages in graphic scales. They are simple and easy to administer. Such scales are interesting to the rater and require little added motivation. However, scoring in the case of some formats of graphic scale is rather laborious.

Standard Scales

In standard scales, a set of standards is presented to the rater. The standards are usually objects of the same kind to be rated with pre-established scale values. This type is like that of the scales for judging the quality of handwriting. The scales of handwriting provide several standard specimens that have previously been spread over on a common scale by some standardised procedure like equal-appearing intervals. With the help of these standard specimens, a new sample of handwriting can be equated to one of the standards, judged as being between two standards. The ‘man-to-man scale’ and the ‘portrait-matching’ scale are the other two forms that conform more or less to the principles of standard scales.

Rating by Cumulated Points

The unique and distinctive feature of rating by cumulative points is its immense use and ease of scoring. The rating score for an attribute object or individual is the sum or average of the weighted or unweighted points. The ‘check-list method’ and the ‘guess-who technique’ belong to this category of rating. ‘Check list methods’ are applicable in the evaluation of the performance of personnel in a job. The weights of 1 and –1 are assigned to every favourable and unfavourable trait, characteristic or attribute and the individual’s score is the algebraic sum of the weights. In ‘guess-who technique’, some statements like “here is the one who is always doing the wrong things to make others sad”, are constructed and each individual is asked to list all the members of his/her group who fitted such description, mentioning the same individual as many times as necessary. Each individual scores a point for each favourable or unfavourable description applied to him/her, and the total score is the sum total of all such points.

Forced Choice Ratings

In 'forced-choice rating' methods, the rater is asked, not to say whether the ratee has a certain trait or how much of it the ratee has, but to essentially say whether he/she has some or one trait or another of a pair. For example instead of deciding whether individuals' leadership qualities are superior or above average, it may be asked if the person:

- exerts strong influence on his/her associates,
- is able to make others act, and
- asserts during functions.

Uses of Rating Scales

The uses of rating scales are described below:

- i) Rating methods consume much less time than other method of scaling like 'pair comparison' and 'rank ordering'.
- ii) Rating methods are quite interesting to the raters, especially if graphic methods are used.
- iii) Best ratings can be obtained by presenting one stimulus to a rater at a time.
- iv) Rating scales can be used with large numbers of stimuli to a rater at a time.
- v) Rating scales can be used with raters who have very little training for the purpose.
- vi) Rating methods can be used with large numbers of stimuli.
- vii) Rating scales have much wider range of applications and can be used for tutor-ratings, personality ratings, school appraisal, sociological surveys, etc.

Limitations of Rating Scales

Rating scales have several limitations. Some of them are discussed as follows:

- i) *Error of leniency*: There is a constant tendency among the raters to rate those whom they know well, higher than they should. Such raters are called 'easy raters'. Some raters become aware of their easy rating and consequently rate individuals lower than they should. Such raters are called 'hard raters'. The leniency error refers to a general and consistent tendency for a rater to rate too high or too low for whatever reasons.
- ii) *Error of central tendency*: Most of the raters hesitate to rate the individuals on the extremes of the scales, instead they tend to rate the individuals on the middle of the scale. Obviously, the results get distorted.
- iii) *Halo-effect*: Halo-effect is an error which obscures the clusters of traits within an individual. The rater forms a general opinion about the person's merit and his/her ratings on specific traits are greatly influenced by this general impression. It results in a spurious positive correlation among the traits which are rated. If a learner likes a tutor, he/she will rate the tutor high on all traits without considering the meaning attached to a particular trait.

- iv) *The logical error*: The logical error is due to the fact that judges are likely to give similar ratings for traits which they feel are logically related to each other.
- v) *The contrast error*: The contrast error is due to a tendency of a rater to rate others in the opposite direction (contrasting) from himself/herself in a trait.
- vi) *The proximity error*: It has been seen that adjacent traits on a rating scale tend to inter-correlate higher than the remote ones, their degree of actual similarity being approximately equal. This error may be countered to some extent by placing similar traits farther apart and the dissimilar ones closer.

Check Your Progress 2

1) List the types of rating scale.

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Attitude Scale

‘Attitude’ is defined as the degree of positive or negative effect associated with a certain psychological entity. In other words it is the pre-disposition of an individual towards a psychological entity—may be an institution, ideal, symbol, phrase, slogan, job or idea towards which people respond positively or negatively. The inquiry form that attempts to assess the attitude or belief of an individual is known as Attitude Scale.

Types of Attitudes Scales

Various scaling techniques have led to the development of different types of attitude scales which provide quick and convenient measure of attitudes. However, the method of ‘equal-appearing intervals’ (Thurstone Scales) and ‘method of summated ratings’ (Likert Scales) have been extensively used in attitude or opinion research. The attitude scales that are developed using these scaling techniques consist of a number of carefully edited and selected items called ‘statements’.

The method of ‘equal-appearing intervals’ was originally developed by Thurstone and Chave (1929). The attitude score of an individual obtained by this method has an absolute interpretation in terms of the psychological continuum of scale value of the statements making up the scale. If this score falls in the middle range of the psychological

continuum, the attitude of the individual is described as “neutral”. If it falls towards the favourable end of the continuum, it is described as “favourable” and if it falls towards the ‘unfavourable’ end, it is described as “unfavourable”.

In the ‘method of summated ratings’ developed by Likert, the item score is obtained by assigning arbitrary weights of 5, 4, 3, 2, and 1 for strongly agree (SA), agree (A), undecided (U), disagree (D), and strongly disagree (SD) respectively, for the statements, favouring a point of view. On the other hand, the scoring weights of 1, 2, 3, 4, and 5 are given for the respective responses for statements opposing this point of view. An individual’s score on a particular attitude scale is the sum of his/her rating on all the items.

Uses of Attitude Scales

- i) Attitude scales are used to measure the degree of positive or negative feeling associated with any slogan, person, institution, religion, political party, etc.
- ii) Attitude scales are used in public-opinion-surveys in order to make some important and crucial decisions. Industrial, political, educational and other leaders seek knowledge of public opinions and attitudes. Educationalists, for example, conduct opinion surveys to find out how people feel about educational issues. Business firms make public opinion surveys to find out what type of product, packaging or advertising appeals to the purchasers. Politicians conduct opinion surveys to predict how people will vote or what programmes they are likely to favour.

Limitations of Attitude Scales

The process of assessing attitude with the help of attitude scales has various limitations.

- i) An individual may conceal his/her real attitude, and express socially acceptable opinions only.
- ii) An individual may not really know how he/she feels about social issues and he/she may never have given the idea a serious consideration.
- iii) An individual may not be able to express his/her attitude towards an abstract situation unless he/she actually confronts with it in his/her real life.

Check Your Progress 3

- 1) Describe briefly the uses and limitations of attitude scales.

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Tests

A test, in the narrowest sense, connotes the presentation of a standard set of questions to be answered. We obtain a measure (a numerical value) of a characteristic or attribute of a person pertaining to his/her potential knowledge of, say mathematics, honesty, perseverance, creativity from his/her answers to such a series of questions.

Types of Tests

Tests may be classified in different ways, some of which are described as follows:

A) *On the basis of administration*: We have three categories under this classification:

- i) *Power vs. Speed tests*: A 'power test' is a test in which every subject has a chance to attempt each item of the test. It has no time limit and the subject goes on attempting test items till he/she can no longer continue successfully. On the other hand, a 'speed test' is defined as one in which no subject has enough time to attempt all items. Most entrance tests held for admission into various university courses are speed tests. A large number of items are given to be attempted within a fixed time.
- ii) *Individual vs. Group tests*: The tests which are administered on one individual at a time are known as 'individual tests'. These tests are useful in situations where a precise and detailed assessment of some characteristics of an individual is desired.

The test which is administered to many subjects at the same time is termed as a 'group test'. These tests are particularly useful when large number of subjects have to be tested at the same time

- iii) *Paper-pencil and Performance tests*: 'Paper-pencil tests' require the subject to respond to the item by writing his/her replies. They pose questions in the form of sentences, or designs, and require the subject to record his/her answer either by underlining, ticking or encircling one of the alternative answers or by writing a word, phrase or sentence in the blank space provided for this purpose.

On the other hand, in 'performance tests', problems are presented in a correct form and the subject is required to respond not by writing but by manipulating toys, blocks or picture cards, etc., depending on the level of the test administrator.

B) *On the basis of standardisation*: On the basis of standardisation, tests can be classified into two categories:

- i) Non-standardised teacher-made tests and
- ii) Standardised tests.

Teachers use their own tests in classroom situations to assess the achievement of learners in different subjects/disciplines. Such tests are designed for specific use and their reliability or validity is not established by careful statistical controls. By contrast, in standardised tests each item and total score are carefully analysed. The content, administration and scoring in these tests are standardised.

C) *On the basis of traits and abilities to be measured:* Tests can also be classified in terms of their purpose, that is, the types of abilities and psychological traits they describe and claim to measure. By this standard, we may distinguish five major classes of tests, each with many sub-classes:

- i) the tests of general mental ability or intelligence,
- ii) the tests of special abilities or aptitudes,
- iii) the tests of creativity,
- iv) the tests of attainment and
- v) the personality measure.

i) Tests of General Mental Ability or Intelligence

Tests of general mental ability measure which enter into performance of all activities and which differs in magnitude from individual to individual. The items in such tests assess the subjects' ability to perceive relationships, solve problems and apply knowledge in a variety of ways. Intelligence tests are classified as verbal and non-verbal tests, paper-pencil and performance tests, speed and power tests and individual and group tests.

ii) Tests of Special Abilities or Aptitudes

Although intelligence tests seek to measure abilities which are valuable in almost any type of mental applications, effective educational/vocational guidance and proper placement calls for tests directed at specialised abilities. Such types of test are called tests of special abilities or aptitudes. These tests are used mainly to predict success in some occupation, academic or training course. For example, for selecting clerks for a bank, clerical aptitude tests have to be administered. Similarly for admitting learners to a social work course, social service aptitude test has to be administered.

iii) Tests of Creative Thinking

There are two distinct types of thinking ability: namely, convergent thinking and divergent thinking. Convergent thinking involves the generation of ideas and facts from available information and in test of convergent thinking (tests of general intelligence and aptitude), the subject is asked to define a word, solve an arithmetical problem, find the next number to continue a series, etc. Divergent thinking involves generation of novel responses to situations; responses that are original, unusual and varied. This thinking generally goes by the name 'creativity' and tests which are used to measure it are called tests of creative thinking or creativity. In such tests, the subject is encouraged to generate multiple responses to a problem. The responses are evaluated in terms of fluency (number of responses), flexibility (number of different categories of responses), and originality (number of responses given). For example, the respondents may be asked to name objects that are round in shape. Large and varied responses are expected to this question. Such items are included in a creativity test.

iv) Tests of Attainment or Achievement

Tests which are conducted to measure present performance vis-à-vis the skill or knowledge that has been acquired as a result of training are called attainment or

achievement tests. They are designed to measure an individual's level of learning in a particular discipline, subject or course at the end of instruction. If an achievement test is developed to assess whether a student possesses required skills in terms of a specified criterion at a particular time, the test is designed as 'criterion-referenced mastery test'. If, on the other hand, the test is to assess the student's relative position in a group, the test is called 'discriminatory or norm-referenced test'

Achievement tests may be classified as traditional or essay-type, and new-type or objective tests. New type or objective tests include multiple-choice, true-false, completion, matching and short answer items.

v) **Personality Measures**

Personality measures are obtained by either projective or non-projective techniques.

Projective techniques are used to make an assessment of various aspects of personality which cannot be measured easily by any other means.

The non-projective techniques of personality measurement include personality inventories, interest inventories, value inventories, etc. An inventory is constructed in the form of a questionnaire. It consists of a series of questions or statements to which subjects respond by answering 'yes' or 'no', 'agree' or 'disagree' to indicate preferences that describe their typical behaviour(s).

Uses of Tests

The major role of educational institutions is to facilitate certain types of student learning. The tutor should encourage activities that promote desirable student learning and discourage that do not promote such learning. Tests help in identifying such types of activities.

- i) They help in (a) providing knowledge concerning the learners entry behaviour, (b) setting, refining, and clarifying realistic goals for each learner, (c) evaluating the degree to which the objectives have been achieved, and (d) determining, evaluating, and refining the instructional techniques. There are many ways through which we can obtain information about entry behaviour of the learners. Aptitude and intelligence tests provide information about the entry behaviour of learners. Aptitude and intelligence tests provide information concerning the speed and the ease with which a learner can be expected to learn. Achievement tests provide information as to whether a learner is weak or strong in a particular discipline/subject. For more information regarding deficiencies, diagnostic tests are used.
- ii) Tests serve various purposes in the process of counselling and guidance. Sometimes test results are used to confirm a learner's ideas about his/her skill, abilities or personality characteristics. Tests may also be used to provide an estimate of the learners probable success in a particular educational or vocational field.
- iii) Many uses of psychological tests in business and industry pertain to decisions about personnel. For example, tests may be used for selecting candidates from the among applicants, for placement of workers on jobs, and for determining whether a worker is suitable for promotion. Tests may be used in either of the two ways: (i) to measure an individual's abilities and

characteristics in order to predict his/her performance on the new job, or (ii) as proficiency measures to establish whether the individual possesses the knowledge and skills as outlined in the job-specifications. Such tests are also used in training programmes, both as criterion measures and as learning experience. Besides, they may be used to study the nature of jobs, to determine the abilities and characteristics that suit workers on various jobs and how these characteristics influence the different ways the job is performed.

Limitations of Tests

- i) Tests of intelligence or special aptitude should not be considered as the absolute measure of pure intelligence or creative thinking because the performance in such tests is partly determined by one's background and schooling.
- ii) Inventories used for personality assessment have low predictive validity especially when the subjects tested are below seventeen years of age.
- iii) Tests measuring cognitive processes can hardly measure higher mental processes such as ability to discover scientific laws and principles.
- iv) The strength and depth of understanding of individual and appreciative reactions in ethical, social or aesthetic fields are hardly measured by tests.

2.4 LET US SUM UP

In this Chapter, we have described the various types of research tools and their uses and limitations.

- Questionnaires, interviews, rating scales, attitude scales, and tests, are the main data-gathering research tools or techniques.
- Questionnaires consist of a series of questions dealing with psychological, social, educational, and other related issues. Questionnaires are either structured or unstructured. A good questionnaire is specific in purpose, simple in language, logical in arrangement of questions and moderate in length. It is administered personally or mailed to individuals.
- Rating scales are used to obtain judgement on a set of points which describe varying degrees of an attribute under observation. Numerical scales, graphic scales, rating by cumulative points and forced choice ratings are the commonly used rating techniques. Leniency error, central tendency error, halo-effect, logical error, contrast error and proximity error are the major error types which are faced in of using rating scales.
- Attitude scales are used to assess the attitude of an individual towards another individual, slogan, religion, institution, a different mode of teaching etc. they are mostly used in opinion surveys. Thurstone's method of 'equal appearing intervals' and Likert's method of 'summated ratings' are extensively used in the construction of attitude scales.
- A test is a standard set of questions which is used to obtain a measure (a numerical value) of an attribute or a characteristic of a person pertaining to his/her academic achievement, interests, values, personality traits, intelligence, etc.

2.5 GLOSSARY

- Tool** : An instrument used for gathering data or information pertaining to certain attributes or characteristics of an individual or a group; issues relating to society, systems etc.
- Questionnaire** : Printed form containing a set of questions of 'open' and 'closed' types with spaces for filling in responses by the respondent.
- Structure Questionnaire** : A questionnaire in which questions are framed with a view to limiting the variety of responses made by the respondent.
- Ustructured Questionnaire** : A questionnaire in which the questions are left open with a view to providing freedom to respondents for giving responses.
- Rating** : A term applied to an expression of opinion or judgement regarding some situation, object or character.
- Rating Scale** : A scale with a set of points which describe varying degrees of the dimension of an attribute under observation.
- Attitude** : The degree of positive or negative affect associated with some psychological object. By psychological object we mean any institution, ideal, symbol, phrase, slogan, job or idea towards which people can differ in their opinion.
- Attitude Scale** : A device which provides a measure of attitudes. It consists of a series of short but carefully formulated statements or propositions dealing with several selected aspects or many appropriate aspects of issues, institutions or groups of people under study.
- Tests** : (i) Any tool by which the presence, quality or genuineness of anything is determined; (ii) A device to evaluate the performance and capabilities of a learner or class (for example, knowledge of a subject); (iii) A procedure for eliciting responses upon which appraisal of the individual can be based (for example, intelligence, creativity etc.)

2.6 CHECK YOUR PROGRESS: THE KEY

Check Your Progress 1

A good questionnaire must:

- Indicate its objectives through the questions,
- use a direct, concise and simple language,
- include a series of 'why', 'what', 'when' and 'how' questions,
- place questions in a logical order, and
- include a relatively small number of questions and demand several forms of responses.

Check Your Progress 2

Rating scales are broadly classified into five types:

- i) numerical scales,
- ii) graphical scales,
- iii) standard scales,
- iv) rating by cumulative points, and
- v) forced choice ratings.

Check Your Progress 3

Attitude scales:

Uses

- The degree of positive or negative feelings associated with a slogan, person, institution, etc. is measured easily using such scales.
- They help in taking decisions related to industrial, political and/or educational matters effecting public opinion.

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UNIT 3 INTERVIEW, OBSERVATION AND DOCUMENTS

Structure

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Types of Tools and their Uses
- 3.3 Let Us Sum Up
- 3.4 Glossary
- 3.5 Check Your Progress: The Key
- 3.6 Further Readings and References

3.0 OBJECTIVES

On the completion of this Unit, you should be able to:

- define an interview;
- describe the various types of interviews;
- describe the technique of interviewing;
- describe the uses and limitations of interviews;
- define the observation technique;
- describe the types of observation;
- describe the steps involved in the process of observation;
- describe the uses and limitations of observation;
- define documents;
- describe the uses of documents; and
- describe the uses of documents and journals.

3.1 INTRODUCTION

In previous chapter you read about the four important tools of data collection, namely: *questionnaires*, *attitude scales*, *rating scales*, *tests*, and the techniques of collecting relevant data through these tools and their strengths and limitations.

This chapter is a continuation of previous chapter. In this chapter we shall discuss a few more tools of data collection such as, interviews, observations, and documents. Each of these tools and techniques has a specific role in the process of collecting data and has its own uses and limitations.

Through interview schedule, the researcher can explain more explicitly the purpose of the investigation. Observation is a technique used to classify and record in a

planned manner the individual responses to real life situations. The documents describe the process of personal/group development or the occurrence of an event in accordance with legal or administrative regulations attached to that event. The documents and records are useful in bringing together data for a given time period for scientific analysis.

Types Of Tools And Their Uses

Interview

Interview is a process of communication or interaction in which the subject or interviewee gives the needed information verbally in a face-to-face situation. In a research situation it may be seen as an effective, informal conversation, initiated for a specific purpose as it focusses on certain specific areas. The main objective may be the exchange of ideas and experiences and eliciting of information.

Types of Interview

Interviews may be classified according to the purpose for which they are used and according to their design and structure.

For purposes of research, an interview may be used, as a tool for gathering data required by the researcher to test a hypothesis or to solve his/her problems. This type of interview is called 'research interview'.

Interviews may vary in design and structure. In some situations, an interviewer may interview one individual at a time. It is called an 'individual interview'. In a 'group interview', a group of individuals is interviewed at one and the same time.

Interviews are also classified as 'structured' and 'unstructured'. A 'structured interview' is one in which the whole situation is carefully structured and pre-empted and the major areas of inquiry are mapped out. However, the interviewee is given considerable freedom to express his/her description of the situation. In this type of interview, the interviewer uses a highly standardised tool and a set of pre-determined questions.

'Unstructured interview' is one where the interviewer does not follow a list of predetermined questions. The interviewees are encouraged to relate their concrete experiences with no or little direction from the interviewer, to dwell on whatever events seem significant to them and to provide their own definition of their social situations. Series of questions to be asked are allowed to emerge from the interview itself along with their form sequence in which the questionnaire to be asked.

Techniques of Interviewing

Although the interview as a research tool can be modified according to the needs of the research situation, there are certain techniques that need to be understood. These techniques deal with preparing for the interview, conducting the interview and recording the information gathered.

1) *Preparation for the Interview*

It is necessary to plan carefully for an interview. The interviewer must decide exactly what kind of data the interview should yield, whether the *structured* or *unstructured* type of interview will be more useful and how the results of interview should be recorded. It is advisable to try out the interview on some persons

before using it for actual investigation. This is helpful in revealing the deficiencies or shortcomings that need to be corrected before the interview is carried out. The interviewer must have a clear idea of the sort of information he/she needs, and may accordingly prepare a list of questions in the form of a “schedule”. Interview schedule is a device consisting of a set of questions, which are asked and filled in by an interviewer in a face-to-face situation with the interviewee. Since it is administered personally, it provides the researcher an opportunity to establish a rapport with the respondents. This helps the researcher to explain the nature and purpose of investigation and to make the meaning of the questions clear to the respondents in case they misinterpret a question or give incomplete or indefinite responses. The schedule also economises on time and expenses of investigation. The procedure of constructing a schedule is same as that of a questionnaire.

2) *Conduct of Interview*

In the conduct of an interview, a harmonious relationship between the interviewer and interviewee is most essential. A good rapport helps the interviewee to feel at ease and express himself/herself willingly. In order to establish a good rapport, the interviewer should greet the interviewee in a friendly manner so as to help him/her get settled in a relaxed manner. As an interviewer you should observe the following rules in order to elicit effective responses:

- i) Ask only one question at a time.
- ii) Repeat a question if necessary.
- iii) Try to make sure that the interviewee understands the questions.
- iv) Listen carefully to the interviewee’s answer.
- v) Observe the interviewee’s facial expressions, gestures, and tone or voice so as to derive meanings from his/her body language.
- vi) Allow the interviewee sufficient time to answer the question, but do not let the interview drag on and on.
- vii) Avoid suggesting answers to questions.
- viii) Do not show signs of surprise, shock, anger or other emotions if unexpected answers are given.
- ix) Maintain a neutral stance or attitude with respect to controversial issues during the interview.
- x) Take note of answers that seem to be vague, ambiguous, or evasive.
- xi) Use tact and skill in getting the subject back to an area of inquiry if he/she has strayed too far away from the original question.
- xii) In the unstructured interview, ask additional questions to follow up clues or to obtain additional information.

The interviewer should try to redirect the interview to more fruitful topics when he/she feels that the required information is not sufficient. He/She should wind up the interview before the interviewee becomes tired.

3) *Recording of the Interview*

The recording of the interview is obviously an essential step in interviewing. The interviewer may use a schedule, a structured format, rating scale or a tape recorder

to record the responses of the interviewee. The use of a tape recorder during the conduct of the interview not only eliminates the omissions, distortions, elaboration, and other un-warranted modifications of data usually found in written interview responses, but it also provides an objective basis for evaluating the adequacy of the interview data in relation to the performance of the interviewee. The use of a tape-recorder also permits the interviewer to devote full attention to the interviewee and save much of the time which he/she would otherwise use in writing down the responses during or after the interview. However, if a tape-recorder is not available, the interviewer has to take notes to record the responses.

Uses of the Interview

- i) An interview provides an opportunity to the interviewer to ask questions on various areas of inquiry. It permits greater depth in responses, which is not possible through any other means.
- ii) An interview is not an entirely exclusive tool of research for gathering information pertaining to feelings, attitudes or emotions. It is supplementary to other tools and techniques. A combination of interviewing, observations, and statistical techniques often yields the best results, but the balance of emphasis shifts with the frame of reference and objectives of the study. Since an interview is a highly flexible tool in the hands of skillful interviewers, it allows a more liberal atmosphere than in the use of other techniques of investigation. Questions not readily grasped by interviewees can be rephrased or repeated with proper emphasis and explanations when necessary.
- iii) An interview is an effective tool for a social scientist in the study of human behaviour. Through this technique, a researcher can secure very intimate and personal knowledge about the subject of his/her study, which is denied to the natural scientist, who cannot communicate with the subjects despite all the instruments of precision.

Limitations of the Interview

In spite of many uses of the interview method, it is not without limitations that may jeopardize its value, even when it is used as a supplementary research technique.

- i) Interview is a timeconsuming technique.
- ii) The effectiveness of the interview depends greatly upon the skill of the interviewer which everyone does not ordinarily possess. It takes time to master this skill.
- iii) There is always a danger of subjectivity on the part of the interviewer.
- iv) An interview is very difficult to employ successfully because even in the presence a skilled interviewer some interviewees do not respond freely, frankly and accurately.
- v) Since memory and retention are highly selective processes, interviewees generally provide accurate and vivid accounts of the most recent or intense experiences, or of situations that they encounter most frequently. Painful or embarrassing experiences are often forgotten or even consciously avoided by the interviewees. In such cases, the responses lack accuracy.

Check Your Progress 1

1) In what respects is an interview less useful than a questionnaire? Answer briefly in about 50 words.

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Observation

Observation may be defined as a process in which one or more persons observe some real-life situation and record pertinent occurrences. It is used to evaluate the overt behaviour of the individuals in controlled and uncontrolled situations.

Types of Observation

Observation may be classified into two types:

- a) Participant Observation
- b) Non-participant Observation

Participant observation: In the process of ‘participant observation’, the observer becomes more or less one of the group members and may actually participate in some or the other activity of the group. The observer may play any one of the several roles in observation, with varying degrees of participation: as a visitor, an attentive listener, an eager learner or as a participant observer.

Non-participant observation: In the process of ‘non-participant observation’, the observer takes a position where his/her presence is not felt by the group. He/ She may follow closely the behaviour of an individual or characteristics of one or more groups.

In this type of observation, a one-way ‘vision screen’ permits the observer to see the subject but prevents the subject from seeing the observer.

Observations may also be classified into the following two categories:

- i) Structured observation, and
- ii) Unstructured observation.

Structured observation: Structured observation is formal in character and is designed to provide systematic description to test causal hypothesis. It is executed

in controlled situations like classrooms or laboratory settings. This type of observation starts with relatively specific formulations. There is not much choice with respect to the content of observation. The observer sets up in advance the categories of behaviour in terms of which he/she wishes to analyse the problem, and keeps in mind the time limit within which he/she has to make the observation.

Unstructured observation: Unstructured observation is associated with participant observation and is often an exploratory exercise. In unstructured observation, it may not be possible to categorise behaviour before the observation. The observer considers aspects of behaviour in terms of their contexts or situations of which they are a part.

Stages in the Process of Observation

As a good research technique, observation needs proper planning, expert execution, and adequate recording and interpretation.

i) Planning for observation

Planning for observation includes definition of specific activities or units of behaviour to be observed; the nature of the groups of subjects to be observed; the scope of observation of the individual or group; determination of the length of each observation period and deciding about the tools to be used in making the observation and recording.

ii) Execution of Observation

The expert execution of observation includes:

- a) Proper arrangement of specific conditions for the subject or subjects to be observed,
- b) Assuming proper role or physical positions for observing,
- c) Focussing attention on the specific activities or units of behaviour under observation,
- d) Proper handling of recording instruments to be used, and
- e) Utilizing one's training and experience fairly effectively in terms of making the observation and recording the facts.

iii) Recording and Interpreting the Observation

Recording of the observation data should take place either simultaneously or soon after the observation. In the former case, the observer goes on recording his/her observation data simultaneously with the occurrence of the phenomenon observed. In the latter case, the observer undertakes to record his/her observations not simultaneously with the actual event, but immediately after he/she has observed for a certain period of time while the details are still fresh in his/her mind. In viewing, classifying and recording behaviour, the observer must take utmost care to keep out his/her personal influences, biases, attitudes and values from the observation report. The observer should know what he/she is looking for in a given situation and should carefully and objectively record the relevant data. Subjectivity on the part of an observer may partly be due to his/her emotional involvement, his/her selective perceptions and memory. In order to overcome these biases, various mechanical

instruments are used to obtain more accurate records of events. The use of cameras, tape-recorders, stopwatches, binoculars, audiometer, one-way vision screens, mirrors, etc., allows behaviour to be observed to a degree of accuracy which cannot be achieved by an unaided human observer. It is worthwhile to develop an “observation schedule” like a question-schedule for making and recording observations. The specific behaviours to be observed and recorded should be listed in this schedule.

Uses and Limitations of Observation

Uses

- i) Observation provides a direct method for studying various aspects of human behaviour. Indeed, it may be the only effective way to gather data in a particular situations e.g., behaviours of counsellors in actual counselling sessions.
- ii) Observation enables the researcher to record behaviour at the time of occurrence.

Limitations

- i) A subject may intentionally attempt to exhibit an artificial behaviour when he/she knows that he/she is being observed.
- ii) It is time-consuming and costly.

Check Your Progress 2

- 1) List the various types of observation and the steps involved in them.

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Documents

Documents are records which describe a process of personal/group development, or the occurrence of an event.

The content of the documents/records are normally reviewed in terms of the research problem before they are actually used by the researcher. Since the data comes ready-made as the contents of the document, they do not depend on a specific investigator or research team’s accessibility to the field. The data obtained through observation, tests, questionnaires, and interviews are gathered for a specific purpose and are only drawn from universes in space and time where researchers

are sent by the formulators of that design. Documents, on the other hand, bring together data of remote periods and places for scientific analysis.

Types of Documents

Documents may be classified into three categories on a continuum. At one end of the continuum are 'expressive documents' specifying the process of social interaction and at the other end are those like court records, official histories, and proceedings of commissions. In between, are newspaper stories, recounting, etc. which rarely yield sufficient details of the interactive process. Another important type of document is journals. In this section, we will discuss different types of documents.

i) Expressive Documents

Expressive documents include the following categories:

a) personal letters; b) life or case histories in the form of diaries, biographies and autobiographies; and c) accounts of small-group processes.

Personal letters

Personal letters constitute the most frequently available type of expressive documents. The value of letters as expressive documents varies with the cultural background of the writers. Nonetheless, the writer communicates freely his/her views and emotions in personal letters.

Life histories/case histories

Life or case histories in the form of diaries, biographies and autobiographies have been used extensively by historians. They have been identified as the "personal documents par excellence" by psychologists. However, they have not been used much in social or psychological research.

Accounts of small-group processes

Accounts of small group processes are a third category of expressive documents. Since such accounts are rarely written spontaneously, they are not of much use in any large investigation.

The data obtained from expressive documents are recorded with the help of 'document schedules'. In order to secure measurable data, the items included in this type of schedule are limited to those that can be uniformly secured from a large number of case histories and other records. For example, for a study of the records of drop-outs among the adult learners enrolled with a particular Adult Education Centre, items such as the age, financial position of the family, academic performance during the period of enrollment are necessary. A scrutiny of a large number of record of the above items can yield significant results.

Uses of Expressive Documents

- i) In certain socio-psychological cases, where the researcher needs to understand the "definition of the situation" of a particular group of participants, expressive documents constitute an invaluable source of scientific information.
- ii) Expressive documents are useful in giving the researchers a "feel" for the data and thus produce "hunches" with respect to the most fruitful way of conceptualizing a problem.

iii) Expressive documents are useful in not only identifying the significant variables of a problem but also in suggesting the hypotheses embodying these variables and the verification of the hypotheses.

ii) **Official Records**

Official records provide useful information about the time and occurrence of an event in accordance with legal administrative regulations attached to that event. Such data cover a very wide range comprising extensive records of events, namely: births, deaths, marriages, divorces, institutional attendance (school, college, distance education centre etc.), performance in psychological and educational test, crimes, court actions, prison records, registration, voting, social security payments and benefits, illness/hospital data, production/business records, memberships, census data etc. Official records include legislative, judicial, and executive documents prepared by central or state governments, municipalities, panchayats or other local bodies, such as laws, charters, court proceedings and decisions, the data preserved by missionaries and other religious organisations such as financial records and records of the minutes of the meetings of governing bodies; the information compiled by central or state educational departments, special commissions, professional organisations, school boards, universities, administrative authorities, reports of committees and commissions, administrative orders, educational surveys, annual reports, budgets, pictorial records viz. photographs, remains or relics and the like.

The official records are useful in knowing and understanding past events and trends so as to gain perspective on the present and future. They aim at determining and presenting truthfully the important facts about life, character and achievements of great personalities. Records are helpful in studying the legal basis of educational institutions, status of tutors, and finances, in understanding the history of ideas, major philosophies and scientific thoughts.

Check Your Progress 3

1) List the various types of documents.

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iii) **Journals**

Information about new ideas and developments often appear in journals long before they appear in books. There are many journals currently being published covering various aspects of social work

In fact, they are the best sources for reports on recent researches in the area of social work. Journals provide updated treatment to current questions and issues in social work. They also publish articles of local interest that never appear in the book form. Journals are the best sources for determining contemporary opinion and status, present or past.

All those engaged in research in the area of social work should become acquainted with research and professional journals in social work. Knowledge about the editor of a periodical, the names of its contributors, and the associations or institutions publishing it serve as clues in judging the merit of the journal. Abstracts are also available which include brief summaries of the articles. They serve as one of the most useful reference guides to the researcher and keep him/her abreast of the work that is being done in his/her own field and other related fields.

Check Your Progress 4

1) List the uses of Journals.

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3.3 LET US SUM UP

In this chapter, we have discussed interviews, observations and documents as tools of research

- An interview is a process of interaction in which the subject (interviewee) provides the needed information verbally in a face-to-face situation. Preparation, conduct and recording are the main steps in an interview. It may be structured or unstructured. A structured interview is one in which the whole situation is carefully structured. It is also designated as directive interview. In an unstructured interview also designated as “non-directive interview”, the interviewer does not follow a system or a sequence of predetermined questions.
- Observation refers to technique in which one or more persons observe what is occurring in some real-life situations. It is used to evaluate the overt behaviour of individuals in controlled and uncontrolled situations. As a good research tool, observations need proper planning. Expert execution and adequate recording. Observations may be either participant or non-participant, structured or unstructured.

- Documents are records which provide data to the researcher for scientific analysis. They may be classified into three categories on a continuum. At one end of the continuum are “expressive documents” specifying the process of social interactions and at other end, there are documents (official records) as court records, official histories, etc. yield sufficiently detailed statements about the interactive processes.
- Journals provide information about new ideas and developments much before they appear in books. They publish articles of temporary, local and limited interests that never appear in the book form.

3.4 GLOSSARY

Interview	: A technique for assessing ability, personality etc. in a face-to-face discussion between the interviewer and the interviewee.
Structured Interview	: An interview in which question are framed with a view to limiting the variety of responses made by the subject (interviewee).
Unstructured Interview	: An interview in which the interviewer does not follow a system or list of predetermined questions.
Observation	: A technique for studying overt behaviour by watching activities of individuals in different social settings by talking to them, or by studying their constructive or creative products, etc.
Structured Observation	: Studying of individuals in controlled situations.
Documents	: Records which provide ready-made content of remote time and places.

3.5 CHECK YOUR PROGRESS: THE KEY

- 1) As compared to a Questionnaire, an Interview has the following limitations:
 - It is time consuming.
 - It requires effective communication skills on the part of the interviewer.
 - The interviewer may often be subjective.
 - It is not always possible to extract free, frank and accurate information from the interviewees.
- 2) Observation Types
 - i) Participant observation
 - ii) Non-participant observation (structured and unstructured) Steps in the process of observation: i) Planning; ii) Executing; iii) Recording

- 3) Types of Documents
 - Expressive Documents: a) Personal letters; b) Life or case histories; and c) Accounts of Small Group processes.
 - Official Records
 - Newspaper Stories/Memories.
 - Journal
- 4) Uses of journals
 - i) Journal provides information about new ideas and developments long before they appear in books.
 - ii) Journals publish articles of temporary, local or limited interest that never appear in the book form.

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UNIT 4 DATA COLLECTION

Structure

- 4.0 Objectives
- 4.1 Introduction
- 4.2 The Concept of Data
- 4.3 Methods of Data Collection
- 4.4 Ensuring the Quality of Data
- 4.5 Key Points at a Glance
- 4.6 Let Us Sum Up
- 4.7 Glossary
- 4.8 Check Your Progress: The Key
- 4.9 Further Readings and References

4.0 OBJECTIVES

On the completion of this Unit, you should be able to:

- define the concept of data;
- describe various types of data;
- describe the methods of collecting data; and
- suggest precautions which are needed to ensure the quality of data.

4.1 INTRODUCTION

To carry out a research study, you have to collect the relevant data so that the hypotheses or generalisations you hold tentatively can be verified. This involves selection of samples from the concerned population. In previous chapters, we discussed the concepts of population and sample, various sampling techniques along with different data gathering tools and techniques varying in their complexity, design and ways of administration. Each tool or technique is appropriate for collecting a particular type of data or information, which lends itself to a particular type of analysis and interpretation for drawing meaningful conclusions and generalisations. In this chapter, we shall focus on various methods used for collection of data.

4.2 THE CONCEPT OF DATA

The information collected from various sources through the use of different tools and techniques generally comprise numerical figures, ratings, descriptive narrations, responses to open-ended questions, field notes, etc. This information is called data. Usually, data are categorised as Quantitative and Qualitative data.

1) Quantitative Data

Quantitative data are obtained by applying various scales of measurement. The experiences of people are collected in a way to fit into standard responses to which numerical values are attached. These data are close-ended and hardly provide any depth or details. Quantitative data are either parametric or non-parametric. Parametric data undergo interval or ratio scale measurement. For example, in measuring reaction time, we make use of ratio scale measurement. The score on a psychological test or inventory is an illustration of interval scale measurement. Non-parametric data are obtained by applying nominal or ordinal scales of measurement. These data are either counted or ranked.

2) Qualitative Data

Qualitative data are verbal or symbolic. The detailed descriptions of observed behaviours, people, situations and events, are some examples of qualitative data. For example, the responses to open-ended questions of a questionnaire or a schedule, first hand information from people about their experiences, ideas, beliefs, and selected content or excerpts from documents, case histories, personal diaries and letters are other examples of qualitative data.

Check Your Progress 1

1) List the various types of data/

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4.3 METHODS OF DATA COLLECTION

As discussed earlier, there are mainly three methods of obtaining data: (i) one can ask questions; (ii) one can observe the behaviour of persons, groups or organisations, and their products or outcomes or (iii) one can utilise existing records or data already gathered for purposes other than one's research. In all the researcher needs to familiarise himself/herself with the procedures he/she is to adopt for collecting data from *sample*, *groups* or *records*.

Asking Questions

In the first method, the researcher may use psychological tests, inventories, questionnaires, or schedules. In chapter 10 you have learnt that tests are useful

tools of research. They are devised to evaluate and measure behaviour in a standardized way for the purpose of providing data for most experimental and descriptive studies. Tests and inventories yield objective and standardized descriptions of behaviour, quantified in numerical scores. Under ideal situations, intelligence, aptitude or achievement tests measure the best performance of which individuals are capable. The inventories attempt to measure typical behaviour. In experimental studies, a researcher may use test scores to equate the experimental and control groups, to describe relative skill at this task prior to the application of the teaching methods, to assess gains in achievement resulting from the application of the experimental and control teaching methods, and to evaluate the relative effectiveness of teaching methods. Tests and inventories are frequently used to describe prevailing conditions at a particular time in descriptive research studies. For example, achievement tests are used extensively in school surveys in the appraisal of instruction.

In selecting tests or inventories for collecting data in research situations, a researcher must evaluate their validity, reliability and usability. The information about these criteria are available in their accompanying manuals. The researcher should carefully examine the standardized data of the tests/inventories contained in their manuals and extensive analysis of published evaluations of the instruments. It makes the researcher aware about their usefulness and limitations in different test situations.

Ease of administration, scoring, and interpretation, are important factors in selecting a test or inventory. The tests or inventories which are easily and effectively administered, scored, and interpreted should generally be used.

The procedure given in the manual for administering a test or an inventory should be strictly followed to collect dependable data. The cooperation of the subjects must be ensured at each stage of data collection. The subjects should be encouraged to provide objective information. The responses of the subjects should be independent of the personal judgement/view of the researcher who is using the test or inventory. The testing conditions should be made interesting and encouraging so as to gain the cooperation of the subjects.

Questionnaires and interview schedules are the other tools of research through which information is sought. The reliability and validity of the data gathered through questionnaires or interview schedules depends not only on their design but also on the manner of administering the questionnaire or the technique of interviewing. The questionnaire is generally sent through mail to the subjects for answering without any further assistance from the researcher. The schedule, on the other hand, is generally filled out by the researcher who can interpret, explain and expand upon the questions whenever necessary. In certain situations when the researcher administers the questionnaire personally it creates an opportunity to establish rapport with the subjects, explain them the purpose of the study, and the meaning of items that may not be clear. The availability of a number of subjects in one place helps in exercising economy of time and expense and provides a high proportion of usable responses. However, subjects who have the desired information cannot always be contacted personally without spending a great deal of time and money in travel. It is in such situations that mailed questionnaires are useful.

The researcher should choose the respondents carefully before administering the questionnaire. It is important that questionnaires be sent only to those who possess the desired information and are interested to respond conscientiously and objectively.

It is advisable to send a preliminary letter to respondents individually asking whether the individual would be willing to participate in the proposed study. This is not only a courteous approach but also a practical way of identifying those who will willingly cooperate in furnishing the desired information. The researcher should also consider the possibility of providing for anonymous responses if the desired information is delicate or of confidential nature. This approach is helpful in producing objective and honest responses.

Observation of Behaviour

Direct observation of the behaviour of persons, groups or organisations provides reliable and conceptually meaningful data in field studies as well as in laboratory experimentation. You have already learnt that observation is the technique in which one or more persons observe what is occurring in some real-life situation. This technique, like other research tools and techniques needs proper planning, expert execution, and adequate recording and interpretation. Observation is always directed towards a specific goal. It is neither haphazard nor unplanned. The planning for observation includes definition of specific activities or units of behaviour to be observed, the nature of the groups of subjects to be observed, determination of the length of each observation and recording. Effective execution of observation ensures proper arrangement of specific conditions for the subject or subjects to be observed, objective and effective use of recording tools, and interpretation of observation data. Observation may be either participant or non-participant in structured or unstructured situations. Structured observations are executed in controlled situations like classroom or laboratory settings. Unstructured observations are mainly associated with participant observation and it is often an exploratory technique. The recording of the observation data may either be simultaneous or soon after the observation. In the former case, the observer goes on recording his/her observation along with the occurrence of the phenomena observed. In the latter case, the observer undertakes to record his/her observations not simultaneously with the actual observation process, but immediately after he/she has observed for a unit of time while the details are still fresh in the mind. As discussed earlier in chapter 11, an observation schedule is developed and used for recording and taking notes about the observed behaviours. The specific behaviours to be observed and recorded are listed in this schedule.

Observation is done either directly, as when the observer plays a passive role and observes without intervening in any way or in an interview, where the observer plays a more active role, by asking a series of questions or administering a test, and where he/she observes the behaviour of the subject (interviewee) as well as records his/her responses.

Utilisation of Existing Records or Data

In chapter 11, you read that when the researcher uses the method of observation, either participantly or in a non-participant manner, he/she focuses on those aspects of the behaviour of an individual or individuals which are of interest to him. If he/she uses tests or questionnaires, he/she chooses or frames the tool to suit his/her research needs. He/she uses interviews if he/she needs information on matters of confidential or personal nature. In using these tools, the researcher controls or manipulates the situation according to his/her research objectives. In contrast, the existing data or records/documents bring to the researcher's notice, certain data over which he/she has relatively little control. These come to the researcher

readymade. Some other person, either a participant in a social situation or process, the originator of a system of recording, or the creator of an index, has already determined the form of the data. The data obtained through observation, through tests and questionnaires, and through interviews are gathered for a specific purpose. Documents and records, on the other hand, may bring together data for scientific analysis from remote periods and places. These data provide unique access to historical and social situations too, which are otherwise difficult or expensive to observe. Personal letters, life histories, diaries, autobiographies, court records, proceedings of commissions, seminars and conferences, newspaper stories, registration and census records/information pertaining to births, deaths, marriages, divorces, school attendance, drop-out rate, performance on psychological tests, crimes known to police, arrests, court actions, prison records, voting pattern in the parliament and assembly election, automobile registrations, enrolment of distance learners in different study or regional centers etc., are examples of documents and records.

Check Your Progress 2

1) Describe briefly the methods of collecting data.

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4.4 ENSURING THE QUALITY OF DATA

The adequacy of tool or technique for collection of data is ordinarily judged in terms of the criteria of reliability (consistency), validity and usability. Reliability requires that repeated measurements yield results which are identical or fall within narrow and predictable limits of variability. The criterion of validity demands that measurement be meaningfully related to the research objectives, that is, it should measure what it purports to measure. The requirements of usability ensure objectivity in the use of a tool or technique and economy of time and cost in field situations. A good tool and its objective use in the collection of data ensures quality.

Psychological tests or inventories are likely to gain the cooperation of subjects and conserve the time of all those involved in their administration provided they are administered in a short period of time. The active cooperation of the subjects is likely to enhance the quality of the data. Hence, the researcher should take utmost care in selecting a reliable and valid test from the available standardized tests.

These tests are easily and effectively administered, scored and interpreted by the researcher. They should also be interesting and enjoyable for the subjects so as to ensure genuine data. Boring tests that discourage or antagonise the subjects should not be used for collecting quality data. The testing conditions should be favourable; otherwise, the test is not likely to yield useful and quality data.

The collection of data by means of questionnaires or interview schedules is a highly complicated and technical job which demands considerable effort on the part of the researcher. Much of the quality of the data obtained depends on the skill with which the tools are administered.

Now, we shall discuss some guiding principles which a researcher should consider while using questionnaires or schedules.

The researcher should choose the subjects carefully. It is important to know that only those subjects should be selected who possess the desired information and are likely to be keen to respond conscientiously and objectively. A questionnaire or a schedule, unlike a psychological test or inventory, has a very limited purpose. Hence, the question of validity and reliability of these tools is not dealt with as seriously as in the case of psychological tests or inventories. However, the validity of data gathered through questionnaires or schedules is improved considerably by making the language of the questions less ambiguous. The meaning of all the terms used in the questionnaire/schedule must be clearly defined so that they carry the same meaning for all respondents. The predictive validity of some specific types of questions can also be estimated by follow-up observations of respondent behaviour. The reliability of the responses to the questions can be inferred by a second administration of the tool and comparing the responses with those of the first.

One major problem in interviewing could be due to the inability or unwillingness of the respondent to communicate. His/her involvement in the data in terms of his/her responses and the likelihood of any bias should be looked into carefully by the researcher. It needs to be ensured that the respondent does not withhold or distort facts while communicating them to the researcher. Hence, it is advisable to use other means of data collection to cross-validate the information obtained through a questionnaire or schedule.

Memory bias is another factor that affects the quality of data obtained through interviews. To overcome this problem it is suggested that the research design be carried out over a period of time, applying appropriate tools at reasonable intervals as indicated by the research objectives.

We have already discussed that an interview is a highly flexible tool, provided it is conducted by a skilful researcher. It allows a more liberal atmosphere than in the case of other tools of research. Questions not readily grasped by interviewees should be rephrased, or repeated with proper emphasis and explanations wherever necessary. This is quite useful for handling contradictory statements made by the respondents. It also ensures the quality and consistency of responses. However, questions which are generally vague or obscure should be avoided so as to permit precise answers from the respondents. Sometimes, misunderstandings occur when questions involve usage of technical terms or unfamiliar expressions. Inadequate responses are secured if too many choices are offered during the interview.

For enhancing satisfactory face-to-face relationship between the researcher

(interviewer) and the respondent (interviewee), the former should be properly introduced to the latter. General letter of introduction is of little value. The introduction should be personal. The interviewer also needs to choose a 'suitable' time and place for conducting the interview. The most suitable place would be one where it is believed that the interviewee will be at utmost ease. Politeness on the part of the interviewer is essential for gaining the confidence of the interviewee. It is helpful in gathering reliable and quality responses from the interviewees. In the initial meeting, after friendly greetings are exchanged, the interviewer should explain the purpose of interview to the interviewee. It should be stated in terms that can be understood by the interviewees easily. There will be no difficulty in getting frank and sincere responses from the interviewees if they are confident that the interviewer has no ulterior motives but seeks information only for scientific/research purpose.

Patience and perseverance are two important traits of a good interviewer. Listening to responses of an interviewee, especially in unstructured situations, is hard work. It requires self-restraint, self-discipline, patience and humility. Ability to listen with understanding, respect, and curiosity is the gateway to meaningful communication. An interviewee is likely to provide truthful data if he/she feels that he/she will not meet with interruption, denial, contradictions, and other harassments from the interviewer. He/She is motivated to communicate when the atmosphere is congenial and permissive. However, mere listening is not sufficient. A quiet listener (interviewer) must at the same time be an analytical researcher. Hence, the questions must not only be precise and wisely formulated, but must also be phrased in such a way that they display concern for the interviewee's problems. Some questions are necessary and often unavoidable in a long interview. At times, the interview 'runs dry' and needs restimulation. The description of some incidents lacks clarity or completeness. Hence, it is essential for an interviewer to clarify the doubts, if any, to an interviewee so that the accurate information is made available.

Blunt questions must be avoided as they cause antagonism and withdrawal. Indirect questions are helpful in seeking co-operation of the interviewees. Direct questions satisfy only the interviewer and the data or information collected through such questions gives rise to unrelated facts or incidents. These data are useless for scientific purposes.

As a data-gathering device, observation also makes an important contribution to descriptive research. A number of devices like check-lists, schedules, rating scales, and score cards are used for collecting and recording observations. Quality of these data mostly depends on the application and use of these devices. The observer should constantly keep in mind that it is easy to become attracted by conspicuous, dramatic and interesting events/situations. However, the researcher should safeguard himself/herself against merely observing unique and striking events which have hardly any relationship with actual reality. The validity and the reliability of measurements are improved when observations are not hurried and are made at frequent intervals by the same observer, or when several observers record their observations independently. An observer must try to minimise the error of 'halo-effect' when using a rating scale or a score card. The tendency to rate someone with a pleasing personality high on other traits such as intelligence or professional interest should be curbed. The halo effect is likely to increase when the observer is asked to rate too many factors or traits, he/she is not trained to judge. Hence, it is advisable to allow only a small number of traits for rating while making observations.

The quality and veracity of data depends greatly on the selection of the tools and their judicious use by researchers. It requires careful calibration of the individuals involved in data collection and also their orientation for the development of skills in the use of various research tools and techniques.

Check Your Progress 3

1) Describe how you can ensure the quality of data collected.

i) Using an interview schedule.

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ii) Using observation.

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For the identification of data from various documents and records, the researcher must learn to read them with understanding and insight as a basis for being able to interpret the past, which in turn may help in interpreting present trends and possibly in predicting future events. For this the researcher needs to subject the documents/records to rigorous evaluation. It will involve the dual processes of establishing the authenticity of the source and validity of its contents. This evaluation is called ‘criticism’ of information/data provided by the document/records. The process of establishing authenticity of the data is termed as ‘external criticism’ and that of establishing the validity of their content is termed as internal criticism. External criticism checks the genuineness and authenticity of the source material. For this, the researcher has to determine whether it is what it appears or claims to be and whether it matches with the original so as to save himself/herself from being the victim of a fraud. Through internal criticism the researcher established the validity, credibility and merit of the contents of the document.

Check Your Progress 4

1) Briefly, state the importance of ‘external and internal’ criticism of documents/ records.

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4.5 KEY POINTS AT A GLANCE

- 1) Data are information collected from various sources by using different tools and techniques.
- 2) Data are either quantitative or qualitative
- 3) Parametric data are measured on interval or ratio scales whereas non-parametric data are obtained by applying nominal or ordinal scales of measurement.
- 4) Qualitative data are verbal and symbolic.
- 5) The three methods of obtaining data in research are: (i) one can ask people questions, (ii) one can observe the behaviour of persons, groups, or organisations, and their products or outcomes and, (iii) one can utilise existing records or data already gathered for purposes other than one's research.
- 6) In asking people questions, the researcher may use psychological tests, inventories, questionnaires or schedules.
- 7) Interview schedules provide an opportunity to the researcher to establish rapport with the subjects (interviewees), explain them the purpose of the study and the meaning of the items that may not be clear to them.
- 8) Observation schedules, rating scales, score cards and check-lists are used for recording data collected through observations.
- 9) Existing records and documents include personal letters, life histories, diaries, autobiographies, court records, proceedings of commissions, seminars and conferences, newspaper stories, registration and census records etc.
- 10) Past records and documents provide data for scientific analysis of remote period and place. These data are in a form over which the researcher has little control.
- 11) A valid, reliable and usable tool ensures quality data.
- 12) The quality of the obtained data depends on the skill with which the tools are used and administered.
- 13) The validity of the data gathered through questionnaires or schedules improves considerably by making the language of the questions unambiguous.

- 14) The reliability of the responses to the questions can be inferred by a second administration of the tool and then comparing the questions with those of the first.
- 15) The quality of data obtained through interviews mostly depends on the skillful handling of situations by the interviewer. It requires a lot of patience and perseverance on the part of the interviewer.
- 16) A good interview requires self-restraint, self-discipline, patience and humility.
- 17) Critical appraisal of the documents helps in establishing the authenticity and veracity of data/documents/records.

4.6 LET US SUM UP

In this chapter we elaborated on the concept of data, methods of data collection and the precautions which are needed for ensuring quality data.

- 1) The information collected from various sources with the help of different tools and techniques generally comprises figures, ratings, descriptive narrations, responses to open-ended questions, field notes, life-histories, proceedings of seminars, conferences, etc. All these are called data.
- 2) Data are either quantitative or qualitative. Quantitative data are parametric or non-parametric.
- 3) Parametric data are measured by interval or ratio scales. Non-parametric data are obtained by applying nominal or ordinal scales of measurement. These data are either counted or ranked.
- 4) Qualitative data are verbal or symbolic materials. The detailed descriptions of observed behaviours, people, situations and events, are some examples of qualitative data.
- 5) There are three methods of obtaining data in research: (i) one can ask questions by using psychological tests, inventories, questionnaires or schedules, and interviews, (ii) one can observe the behaviour of persons, groups or organizations, and their products or outcomes by using participant or non-participant observation, and (iii) one can utilise existing records or documents like personal letters, life histories, autobiographies, school records, performances or psychological or academic tests, etc.
- 6) The quality of the data obtained with the help of various tools depends upon their reliability, validity and objectivity in using them.
- 7) The validity and reliability of the data gathered through questionnaires and schedules are ensured by making the language of questions unambiguous, and also by selecting respondents who possess desired information and are likely to be keen to respond conscientiously and objectively.
- 8) A good quality data through interviews can be obtained through the willing co-operation of the interviewees.
- 9) Patience and perseverance, self-restraint and self-discipline, and listening with understanding are important traits of a good interviewer. These traits motivate an interviewee to disclose all the required information with ease and confidence.

- 10) Checklists, rating scales, score cards and observation schedules are the tools that are used for collecting and recording observations. The quality of these data mostly depends on the application and the objective use of tools. A good observation is not hurried. It is made at frequent intervals by the same observer or by several observers independently at a given time.

4.7 GLOSSARY

- Data** : Consists of all relevant materials, past and present, serving as bases for study and analysis. They are quantitative and qualitative. Quantitative data are numerical figures or ratings whereas descriptive narration, responses, to open-ended questions, quotations, field notes etc. are qualitative data.
- Test Inventory** : (i) Any tool by which the presence, quality or genuineness of anything is determined; (ii) a device to evaluate the performance and capabilities of an individual or group, (iii) procedure for eliciting responses upon which an appraisal of the individual concerned can be made.
- Rating** : A term applied to the expression of opinion or judgement regarding some situation, object or character.
- Rating Scale** : A scale with a set of points which describe varying degrees of an attitude under study.
- Score Card** : It is an elaborate form of a rating scale.
- Questionnaire** : A series of questions dealing with psychological social, educational or any other topic sent to an individual or a group, with the object of obtaining data with regard to the topic under study.
- Schedule** : A device consisting of a set of questions which are asked and filled in by an interviewer in a face-to-face conversation with an interviewee. It is used for recording responses of an interview or data in an observation.
- Checklist** : A device consisting of a prepared list of items which the researcher feels are relevant for his/her study. The researcher checks the presence or absence of the items by making 'yes' or 'no'.
- Interview** : An interview is in a sense an oral questionnaire. Instead of writing the response, the subject gives the needed information orally and face-to-face.

- Observation** : A technique of collecting data by observing activities of individuals in different settings, by talking to them, or studying their constructive or creative products.
- Structured Observation** : The process of observing individuals in controlled situations.
- Document** : A record of the events of the past. Personal letters, life histories or accounts of small group processes are the examples of documents.
- Reliability and Validity of Data** : Reliability and validity of the data means the consistency and the truthfulness of the data. These are ensured by using reliable, valid and objectively usable tools.
- Halo-effect** : An error which distorts an observer's ratings of the cluster of traits in an individual. The rater forms a general opinion about the subject's merits and his/ her ratings on specific traits are generally influenced by this general impression. The result is that most ratings get distorted.

4.8 CHECK YOUR PROGRESS: THE KEY

Check Your Progress 1

Data are of two types: (i) quantitative data and (ii) qualitative data. Quantitative data are numerical figures obtained by applying interval, ordinal or nominal scales of measurement. Qualitative data are verbal or other symbolic materials.

Check Your Progress 2

There are three methods of obtaining/collecting data in research:

- i) one can ask questions by using psychological tests/inventories, questionnaires or interview schedules.
- ii) one can observe the behaviour of persons, groups or organisations, and their products or outcomes through participant or non-participant observations. The data are recorded using an observation schedule, a rating scale or a score card.
- iii) one can utilise existing records or documents available in the form of personal letters, life histories, diaries, registration/census data, etc.

Check Your Progress 3

Using an Interview Schedule Assign as:

- i) Establish rapport with the interviewee(s).
- ii) Explain to the interviewee(s) the purpose of the study.

- iii) Chose interviewees carefully by selecting those who are willing to provide the desired information and are likely to be keen to respond conscientiously and objectively.
- iv) Provide enough flexibility to the interviewees by exhibiting patience, perseverance, self-restraint and self-discipline.
- v) Motivate the interviewees by asking questions not only precisely and wisely, but which show concern for their problems.

Using observation

- i) Make proper planning with regard to (a) the selection of subject(s) to be observed; (b) selection and arrangement of special condition(s), if any, for the group; (c) physical position of the observer and possible effect on the subject(s) to be observed; (d) the definition of specific activities/ characteristics of behaviour to be observed; and (e) training of the observer in recording the behaviour, etc.
- ii) Effective execution of the task of observing the specific conditions of the subjects; proper handling of the recording instruments/tools, and proper precautions in case of participant observation.
- iii) Minimal halo-effect error while rating/observing the behaviour.
- iv) Ensuring the validity and reliability of the observational measurements through observations which are not hurried and are made at frequent intervals by the same observer, or when several observers record their observations independently.

Check Your Progress 4

External and Internal Criticism of Documents

A rigorous evaluation of the document is called the criticism of documents. It involves the dual processes of establishing the authenticity of the source and of establishing the validity of its contents. External criticism is helpful in establishing the authenticity of the document(s) and internal criticism establishes their truthfulness, credibility and merit.

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