TEERTHANKER MAHAVEER UNIVERSITY
TMU
MORADABAD
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# Methods and Tools in Social Research

MASCCC204

CENTRE FOR DISTANCE AND ONLINE EDUCATION

CENTRE FOR DISTANCE AND ONLINE EDUCATION


# METHODS AND TOOLS IN SOCIAL RESEARCH

## (MASCCC204)

## REVIEW COMMITTEE

Prof. Dr. Manjula Jain
Dean (Academics)
Teerthanker Mahaveer University (TMU)

Prof. Dr. Vipin Jain
Director, CDOE
Teerthanker Mahaveer University (TMU)

Prof. Amit Kansal
Associate Dean (Academics)
Teerthanker Mahaveer University (TMU)

Prof. Dr. Manoj Rana
Jt - Director, CDOE
Teerthanker Mahaveer University (TMU)

## PROGRAMME COORDINATOR

Dr. Ompal Singh
Assistant Professor
Department of Humanities
Centre for Distance and Online Education (CDOE)
Teerthanker Mahaveer University (TMU)

## BLOCK PREPARATION

Ms.Ankita Singh
Department of Management
Centre for Distance and Online Education (CDOE)
Teerthanker Mahaveer University (TMU)

**Secretarial Assistance and Composed By:**
Mr. Namit Bhatnagar


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# SYLLABUS

## Methodology of Social Research

**Objectives**

- This course plan aims to provide exposure of the students to the fundamentals of various research techniques and methods (both quantitative and qualitative).
- It tries to build upon the basic assumptions in adopting different methodologies for different kinds of research themes.

| Sr. No. | Content |
|---|---|
| 1 | Quantitative Methods and Survey Research: Survey techniques, Sampling Design, Questionnaire and Interview schedule, Reliability and Validity, Limitations of Survey |
| 2 | Qualitative Research Techniques I: Techniques and methods of qualitative research, Participant observation, Ethnography |
| 3 | Qualitative Research Techniques II: Case study method, Content analysis, Oral history, narratives, Methodological dilemmas and issues in qualitative research, Validity and reliability in qualitative research |
| 4 | Statistics in Social Research: Methods: Meaning, characteristics of statistical method; Measures of central tendency: Mean, Median, Mode; Measures of Dispersion: Standard Deviation |
| 5 | Statistics in Social Research: Correlational Analysis: Test of significance and co-variance, Writing a Research Report |

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# Unit-1: Survey Techniques

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## Objectives

After studying this unit students will be able to:

- Understand the meaning of survey.
- Know, why Social Survey is done?
- Know the difference between Social Survey and Social Research.

## Introduction

Social Survey is an important study–pattern of social science. This is a scientific tool to study the social problems and solutions. Scientific in the sense that the surveyor directly comes in contact with the incidents and derives any solution or conclusion on the basis of real survey tests. But to know more in this connection it is necessary and better to know the definition and meaning of survey techniques.

## 1.1 Definition and Meaning of Social Survey

1. **Pauline V. Young—** "Normally we feel now that social survey is related to the construction of creative planning of social improvement and progress for the future and present conditions of social vyadhisastriya environment, which has specific geographical limits and specific social meaning and social importance. These circumstances can be measured and can be compared with those conditions which can be accepted as an ideal form.
2. **Bogardus—** "Broadly, social survey is the collection of data related to the way of living and conditions of working of a particular group of people."
3. **N. Morse—** "In short, survey is only a method of interpretation done in a scientific and sequential manner for social conditions, problems or census purposes.

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4. **Mark Abrams—** "Social survey is a process through which the numeric data related to social side of texture and activities of a particular community can be collected."
5. **E.W. Burgess—** "Survey of a community, is the scientific study of its conditions and reqiurements done for the purpose of presenting the constructive social development planning.

From the above definitions it is clear that social survey is a scientific study done for the purpose of constructive planning. This study is related to uncool-customs of any community, way of living, present conditions, community building and problems, in particular geographical states.

## 1.2 Objective or Roles of Social Survey or Reasons of Planning Social Surveys

According to **Prof. Moser**, "A survey can be arranged or conducted for importance of knowing the administration related data on any side of people life or search related to any work-causes, or to throw new light on any side of sociological theory."

This way to collect information related to any part, social life can be the purpose of social survey. Not only that, presenting any constructive planning for the solution of problems on the basis of received information can also be the purpose of social survey. Indeed, all purposes of social survey or work of social survey in social research or reasons for arranging the social surveys can be presented in the following ways:

1. **Collection of Data Related to Social Aspect of Community—** Through social survey data can be collected in as numerical about construction of a community and social side of works.

*Notes* The main purpose or reason of social survey is to collect data related to social problems and study minutely from their analysis.

2. **Collection of Practical Information—** The purpose of social survey is also to provide behavioural information about social problems. For example , if any government department or organization wants to know how much people expend on food, clothing and shelter and in the same way if any business organization wants to know about the uses of things manufactured by them so for them there would be need to arrange social surveys. Whatever, from this point of view the purpose of social survey is to collect behavioral information about present problems.
3. **Originally Related to the Study for Working Class and its Conditions—** The arrangement of social survey is done for the study of lower or labour class of society since most of the social problems are found in these lower classes. Mostly poverty, squalor, crime, illiteracy problems are found in lower or labour classes. There is a direct or indirect relation of social survey with the study and solution of these problems of society.

*Did You Know?* With the study of these problems, there is a study of society, well-endowed persons?

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Then also it is said that social survey is basically related to the study of conditions of labour and lower class persons.

4. **Verification of Social Laws—** In the changing conditions of social rules and laws there is always a necessity of verification. Therefore many social surveys are done for the verification of these types of old laws and rules.
5. **Testing of Hypothesis—** The tests of their accuracy is only possible when the data are collected by the survey technique based on scientific method. This way the purpose or the main reason of arrangement of many types of surveys is doing the testing of hypothesis.
6. **Knowledge of Cause-effect Relationship—** The main purpose of many social surveys is not only describing the problems, but also doing their deliberation-interpretation. By this interpretation the reasons of related incidents can be found out. This way the knowledge of cause-effects relationship inspires the researcher for the arrangement of social surveys.
7. **Utilitarian Point of View—** The last and most important purpose of social survey is also utilitarian point of view. This way after the survey particular steps can be taken by presenting formatting plans for social improvement, growth and to solve problems.

From the above interpretation the reason for the arrangement of social surveys or the purpose of social surveys or social surveys work gets clarified.by taking into consideration these reasons or purposes, social surveys are organized.

## Self Assessment

Fill in the blanks:

1. Survey is done on any _____ public-life for the necessity of knowing the pranasan related facts.
2. The _____ of any information related to social life can be the purpose of social survey.
3. To present any _____ on the basis of received information can be the purpose of social survey.

## 1.3 Distinction between Social Survey and Social Research

Mostly many people understand social survey and social research are the same. This way there is a possibility of generating much confusion. Basically social survey is, an important technique of social research, both have some primary difference. Difference between both can be cleared from the following table-

| Social Survey | Social Research |
|---|---|
| 1. In social survey scientific techniques and methods are used. | 1. In social Research all aspects and stages of scientific techniques are used. |
| 2. Scientific technique is used in it; therefore it is very close to scientific techniques. | 2. Social Research is in itself a scientific technique. |
| 3. It is not necessary to build any type of hypothesis about social incidents. | 3. It is necessary to build any type of hypothesis about social incidents or things, since research is possible only on the basis of hypothesis. |

**Notes**

| | | | |
|---|---|---|---|
| 4. | Generally survey is good without hypothesis. Hypothesis is its result. | 4. | Its main purpose is to test any formed hypothesis. |
| 5. | For social research survey presents the lists of sub imaginations. | 5. | Tests of hypothesis presented by survey are done by social research. |
| 6. | This is related to specific problems, like study of slums in Delhi. | 6. | It is related to general and intangible problems, like contribution of family in criminal instinct. |
| 7. | After the analysis of social incidents and facts such rules and laws cannot be constructed whose generalization can be done over the whole incidents. This way social survey is related to a limited field. | 7. | After the analysis of social incidents such rules and laws can be constructed. If hypothesis is confirmed from the received data then it is accepted as a normal law and its generalization is done on all such types of incidents. This way social research is related to the whole world. |
| 8. | On the basis of received data social improvement, social treatment and planning of solution of a problem can be done. | 8. | It has no direct relation with social improvement, social treatment and planning of solution of a problem. |
| 9. | It's main purpose is not in the increase of knowledge, but to use gained knowledge in formative planning. | 9. | Its main purpose is to regularly increase in the knowledge. It has no relation with the usefulness. |
| 10. | It is related to immediate problems and immediate control and fulfillment of necessities. Therefore, immediate action is necessary for improvements and solutions. | 10. | Social research thinks far. It has no relation with the immediate solutions. |

## 1.4 Summary

- According to Bogardus "Social survey is the collection of data related to the way of living and conditions of working of a particular group of people."
- The arrangement of social survey is done for the study of lower or labor class of society since most of the social problems are found in these lower classes.

## 1.5 Keywords

1. **Social Survey —** The process of systematically collecting the related facts of social life of person residing in specific geographical, cultural or administrative field is called as social survey.
2. **Utilitarian Point of View —** Particular steps can be taken by presenting formatting plans for growth and to solve problems.

## 1.6 Review Questions

1. What do you mean by social survey?
2. Describe the aim of social survey .

## Answers : Self Assessment

**Notes**

1. Side
2. Collection
3. Formatting plans.

## 1.7 Further Readings

*Books*

1. Techniques of Social Research—Sanjeev Mahajan, Arjun Publishing House.
2. Law Sociology—Dr. Ganesh Pandey, Arun Pandey, Radha Publication.

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# Unit-2: Sampling

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## Objectives

After studying this unit students will be able to:

- Know the usefulness of sampling
- Know the procedure of sample selection.
- Know the type of sampling

## Introduction

Selection of few units as representative from the totality for study is called sampling. Use of sampling is being done since ancient times. In daily life also we make a lot of use of sampling method. To know if the rice is cooked or not, housewives test a few rice. In this way, while buying wheat, rice, pulses etc from the market, we check by taking out handful of seeds from the sack or while buying mangoes, by tasting the mango from the bowl, we decide about all the mangoes. By testing only one drop of blood, doctor infers about the disease. Traders for testing molasses, sugar, chilly, coriander, cotton, cloth and thousands of things, take a sample from the whole and find the conclusion and apply this conclusion on the whole. In this way, use of sampling is done massively by common man in daily life.

## 2.1 Sampling

Sampling is the base of social research and survey. Before doing any kind of study, researcher has to decide that whether he will compile the facts by contacting all the members of the group or will select a few members from them as representative and will study them. In this way, research facts can be collected from the field in two ways- (1) Through census method (2) through sampling method

1. In **Census Method** researcher studies the universe or the whole field. He collects the information by establishing contact with all the members or all the units of the field. In our country, this method is used in census being done after every ten years.

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2. In **Sampling Method** few units are selected from the universe as representative and necessary information is obtained about it. for e.g. if we want to know the thoughts of Delhi university students about the Kashmir problem then under census method we will have to compile information by establishing contact with all the students, whereas in sampling method few students are selected as representative and only their study will be done. Before mentioning sampling method, it will be appropriate to think about the census method.

Stephen's view is that before organizing regular population census, always sampling has been used. Before 1900, sampling has been used very little in social research. Bowle in London had first used sampling method for study of houses. Today, use of sampling has become an important stage in research and survey.

## Definition and Meaning of Sampling

Various knowledgeable men have defined sampling in the following manner:

1. As per Goode and Hatt, "a sample, as is clear from the name itself, is a shorter representative of a large group"
2. As per P.V. Young, **"**a statistical sample is a smaller picture of complete group or unity from which sample is taken**".**

## Essential Characteristics of Representative Sample

How practical and scientific will be our inferences about social events from sampling, depends upon perfection of our sample. Hence, for the success of study it is important that in our sample following characteristics are there:

1. **Representation of Universe**: First characteristic of a perfect sample is that it represents the whole. This is possible only when every unit of the whole has got an equal opportunity to be incorporated in the sample. **Lundberg's** view is that representative sampling depends on two things- (i) in how much quantity equality is found in the study facts. (ii) Which method has been adopted in selection of sample?

*Notes* For obtaining perfect sample, it is important that uniformity is brought in units of the whole and selection of sample is done in such a way that every unit gets an independent and equal opportunity to be selected in the sample.

2. **Adequate Size:** For perfect sampling it is important that number of units of sample is sufficient. As many more will be the units in sample, that much more will be the possibility of accuracy in the results, however this is not always necessary that size of sample gives guarantee of sample being representative. Still if we have to study 10000 students and we select only 10 students as representative sample then it cannot be expected they will appropriately represent qualities of all students. Not only the size of sample, but its method of selection should also be appropriate. In this reference P.V. Young has written, "Size of sample is not the necessary insurance of its representation. Small sample selected through appropriate manner are more trustworthy in comparison to large sample selected in inappropriate manner.

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3. **Free from Bias:** A perfect sample should be free from bias and first suggestion else it cannot claim to be representative. While selecting sample must be kept in mind that is on interest, selfishness, ease and will of researcher nor should it have any effects of pre-determination or carelessness of the researcher.
4. **According to Resources:** Representative sample is that which is in accordance with the resources available with the researcher. Only by keeping in mind the resources, number, type and selection method of sample must be determined. If sample is not as per the resources, than there is possibility of bias.
5. **According to Aims:** A perfect sample is that which is in accordance with the aim of research. For e.g. if we are studying the financial- social condition of *bidi workers of Byawar city,* and in our sample such workers are selected who do not do the job of *Bidi* making, our sample will be wasted. Hence, for best sampling it is important that it is based on the aim of research.
6. **Based on General Knowledge and Logic:** A best sample is that which is based on general knowledge and reason. Sample should meet the criterion of reason. A perfect sample cannot be selected only by blindly following the formulae and rules. Along with rules and formulae, in selection of sample, researcher has to use reason and general knowledge also.
7. **Based on Practical Experiences:** For selecting a best sample, we must make use of the experiences of experienced researchers. If, the field of which we are doing the research, someone else has also done its research in the past, we should take the benefit of his experiences. In the same manner, if any research of the same nature has been done then benefit may be taken from its reports and sample bases.
8. **Independence:** All units of the whole should be independent in themselves, i.e. inclusion of one unit in the sample must not be dependent on the other unit. In other words, every unit of the whole should get an independent and equal opportunity to be included in the sample.

## Procedure of Sample Selection

Procedure of sample selection is also an aspect of perfect sampling. It is a technical process for which experienced and trained persons are required. For sample selection we have to go through the following process:

**Determination of Universe:** From which group or field, sample is selected it is called universe. The first step of taking a sample is – determining the universe. Universe can be of two types—Definite or Indefinite. In definite universe, number of units, population of village or city and geographical limits are decided. For e.g. number of students of a university and population and geographical limits of a village or city are definite. In such universe we can know the units definitely but many times, units of universe are undetermined. For e.g., those who use Lux soap, numbers of readers of Sarita are indefinite. There is no geographical limit of indefinite universe. The reason of indefiniteness of such universe is its constant variability. Hence, before selecting the sample, we must determine the universe. Our universe can be any geographical unit, village, city, institution, group or social event.

## Bases of Sampling

The question arises that in sampling, how come small numbers of units are considered to be the representative of the universe. Its root bases are listed below:

1. **Homogeneity of Universe:** Apparently we can see much dissimilarity between people and facts, even, two things made in a factory are not absolutely similar and two twin brothers are also not similar, still if we think over carefully, we will know that in this diversity

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seen on the surface also, there is a unity and similarity imminent. For e.g., in human body composition, apparently many dissimilarities are viewable, still from the bodily point of view many similarities are existent in them. This is the reason that sample is considered to be the representative of universe. **Lundberg** has written, "If excessive similarity is found in the facts there is very little difference in various units of all the facts, then some or any unit from the whole will appropriately represent the unity". In this way sampling method is based on the belief that in diversity also similarities are imminent, which can be searched in the study of social events.

2. **Possibility of Representative Selection:** Sampling is based on this belief that from the whole group, few units may be selected in such a manner that they may represent the unity, but for this it is important that in units of sampling all those attributes should be there which are there in the root unity.

3. **Adequate Accuracy:** Any sample cannot cent-percent represent the unity, still accuracy may be found in adequate amount. Our effort should be that numbers of units in sample are sufficient, so that it is representative and the inferences drawn from its study may correctly portray the actual condition.

4. **Determination of Sampling Unit:** After determining the unity, next step is to determine the units of sample. We have to decide which will be the units of our sample? These units may be anything- person, institution , family, group, profession, residential area etc. Sample units are of four types:

   *(i)* Geographical unit, like—a state, district, city, village, ward etc.

   *(ii)* Building related unit—like house, flat, room, quarter etc.

   *(iii)* Group related unit—like family, school, club, church and committee etc.

   *(iv)* Personal units—like person, ladies, men, labour, student, teacher and farmer etc.

   Unit should be always clear, free of doubt, definite and according to the subject which should get easily available to the researcher.

5. **Source List:** That list in which there is name of all the units of the universe is called source list. Readymade source list may be available or it can be got prepared also. Parton has mentioned many places where source list may be obtained like census report, telephone directory, wage –distribution list, and list of students, taxpayers, teachers, land lords etc. can be obtained from various offices. For a good source list it is important that it is complete, latest, and valid, according to subject and is easily available.

6. **Determination of Sample Size:** The fourth step of sampling process is to determine the size of sample. Size of sample should not be very small or very big, but according to the number and nature of the universe. Size of sample is directly related to the amount of accuracy, time, cost and organization. What should be the size of sample, depends on lot of things like, homogeneity and irregularity of universe,nature of study, method of study, number of units, availability of time and money, amount of accuracy, credibility and authenticity etc.

7. **Selection of Sampling Method:** The last step of sampling method is selection of sampling method. Selection of sampling method depends on problems of study, nature of universe, money, time and availability of workers and resources. Sampling method should be such which can be used easily and there is no bias in taking samples. Which method must be chosen from random sampling, purposive sampling, stratified sampling or nirdistansh sampling, this decision, researcher has to take on the basis of his resourcefulness and his experience related to research.

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## Sel Assessment

Fill in the blanks:

1. Much _____ is seen in people and things, like two things being made in a factory or two twin brothers are not similar.
2. If there is very little difference in various units of all the facts, then some or any unit from the whole will appropriately _____ the unity.
3. Any sample cannot cent-percent _____ the unity still accuracy may be found in adequate amount.

## 2.2 Types of Sampling

Various statisticians and social researchers have mentioned various types of sampling. In our study which kind of sampling we will select, depends upon many things like nature of universe, time, money, labour, availability of experience etc. in selection methods and types of sampling, Random sampling, purposive sampling, stratified sampling, multi-stage sampling, area sampling, convenience sampling, self selected sampling etc. are main.

## 1. Random Sampling

Random sampling is that sampling in which each unit of universe has an equal opportunity of being selected in it, ending the individual importance of the units of universe, in their place 'possibility' is established, in which there is possibility of selection of all the units in the sample. Every unit is provided to freedom of appearing in sample. In this method, researcher's inclination is not towards any special unit, but the entire process of selection is left on chance and randomness. That is why it is called random sampling. Random sampling has been defined by various knowledgeable men in the following manner:

As per Parton, "use of random selection is considered to be at that time when method of selection is such that there is equal opportunity of selection of each unit and fact."

As per Harper, "A random sample is that sample which has been selected in such a manner that each unit of the universe had got an equal opportunity to be included."

As per Goode and Hatt, in a random sample, units of universe are ordered in such a way that the selection process offers an equal possibility of selection to each unit of that universe.

As per Yule and Candle, "when there is an equal opportunity of selection to each unit of the universe, then selection of unit from the universe is random sampling".

In words of Frankyets, "random sample will only be that in which every unit of universe has an equal chance of being included in the sample."

From the above definitions it is clear that random sampling is not full of carelessness, unorganised or full of negligence and sudden.

## Methods of Selecting Random Sample

There are many methods of selecting random sample. Out of those, main ones are mentioned below.

**(a) Lottery Method:** Under this process, same method is applied which is used in taking out other types of lotteries. Names or numbers of all the units of universe are written in chits of papers or small square cards, and then they are mixed well by placing a vessel, box or bag so

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that they are properly unarranged. Then keeping the eyes closed, as many number of cards or chits are selected as many units have to be included in the sample. Whichever units come in such random selection, they are studied.

**(b)** **Card or Ticket Method:** In this method, first of all name or number or any other symbol of every unit of universe is imprinted on cards or tickets of same size, colour and thickness, and they are mixed and filled in a round drum. All cards are mixed well by speedily rotating the drum for fifty times. Then one card is taken out spontaneously. Again the drum is rotated for fifty times and second card is taken out. This process is done as many numbers of times as many numbers of samples have to be selected. Cards that come in such selection, units related to those only are studied. This is the only difference in lottery method and card method that in lottery method researcher himself takes out the card with his eyes closed, but in card method any other person can also take out the card with his eyes open.

**(c)** **Regular Marking Method:** When all the units of universe are arranged in a special way, time, place, etc. then selection of sample can be easily done by regular marking method. In this method first of all a list is prepared by adding an ordinal to all the units of universe. After this it is decided that from those units, how many units we need to select as sample and then keeping the list and, by selecting any number every $5^{th}$ or every $10^{th}$ or according to any each number, regular numbers are selected. For e.g. if we have to select 10 students from a universe of 100 students, first we will have to prepare a list of those 100 students. After that, since we have to select 10 students, every $10^{th}$ student will come in our selection. We may start this selection from any number marked in the list. Suppose we start selecting from ordinal 5, and then students with numbers 5, 15, 25, 35, 45, 55, 65, 75, 85 and 95 will be selected as samples.

**(d)** **Irregular Marking Method:** In this method also a list is prepared of all the units of the universe and from that list, leaving the first and the last unit, researcher keeps putting as many marks on the remaining units as many samples he has to select. In this it is expected from the researcher that, leaving the first and the last number, he will select the sample in irregular method without any bias, but in it bias is incorporated.

**(e)** **Tippet Method:** Prof. L.H.C Tippet had made a list of 10400, 4-digit numbers. These numbers have been ensured for the purpose of being used in random sampling method. These numbers have been written without any sequence on many pages. When any researcher has to select a sample for his study, then he takes as many numbers from any page (in the same order) of the list prepared by Prof. Tippet, as many number of samples he has to select. No number should be left in between. In the numbers given by Tippet, first 20 numbers are as follows:

| | | | |
|---|---|---|---|
| 2952 | 6641 | 3392 | 9792 |
| 4167 | 9524 | 1545 | 1396 |
| 2370 | 7483 | 3408 | 2762 |
| 0560 | 5246 | 1112 | 6107 |
| 2754 | 9143 | 1405 | 9025 |

The method of selecting sample by this method can be clarified with the help of an illustration. If from a universe of 100 labours, we have to select 10 labours then firstly we will prepare a list of all the units of universe by arranging them in any order. Then from any point in the Tippet's list we when will take any 10 continuous numbers and will select the labours of that ordinals which will be selected as sample. If sample of these 10 labours will also be selected on the basis of above-mentioned Tippet numbers then they will be like this—52, 67, 70, 60, 54, 41, 24, 33, 46 and 4.31. In the list of universe whichever units will have the ordinal of 52, 67, 70 etc. they will be give a place in a sample of 10 units. Since our universe is only of 100

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labours that is why we will select number within 100 from the list mentioned by Mr. Tippet. Number that appears once it cannot be taken again. Tippet method is considered to be more scientific that is why it is used more.

**(f) Grid Method:** This method is used in area selection i.e. for selecting some specific areas from a huge area, grid method proves useful. In this method first of all, for that huge area, either the geographic map is prepared or it is obtained from somewhere. On that map grid plate, which is made of celluloid or any other transparent material, is kept. In this plate, square boxes are cut on which numbers are written, it is decided beforehand numbers have to be taken in samples. Numbers are decided instantly. In this manner on whichever parts of map, cut parts of the decided numbers come they are marked. These parts or areas are only the units of sample.

**(g) Quota Sampling:** under this method first of all universe is divided in various categories. After this it is decided that how many units need to be selected in each categories, and then researchers spontaneity independently, select same number of units from each category. Units selected in this manner are considered to be samples. Because in this method freedom of selecting the units is given to the researcher, there is much possibility of bias in it.

**Merits of Random Sampling—** Random sampling had its own merits which we may present in the below-mentioned form.

(a) Quality of fairness is there in random sampling. In it there is no possibility of false inclination or bias in selection of sample, any unit is not given any kind of priority or preference and there is equal possibility of each unit getting selected in the sample.

(b) Random sample is representative because in it due to the equal opportunity of section of each unit, in unit of random sample maximum attributes of universe are existent.

(c) Random sampling is the easiest method of sampling in which complex process or esoteric rules do not need to be followed.

(d) In random sampling, possible inaccuracy can be detected. If sample is completely selected through random sampling method, then though mathematical methods it can be correctly guessed that how much the sample differs from the actual measurement.

**Limitations of Random Sampling—** There is no doubt that random sampling is easy, unbiased and representative but still it has its own certain limitations, which we can present in the given manner:

(a) For successful selection of random sample it is important that a detailed and complete list of all the units of universe is prepared. But generally, it is not an easy task especially in a situation when universe is very large. That is why selection of sample completely based on random sampling is not possible.

(b) Under it, researcher has no role in selection of sample. That is why such units are selected which are wide spread or contacting whom is not easy. In such situation, it becomes difficult to remain intact of the sample.

(c) There is no possibility of alternative in random sampling. If we get to know that we cannot establish contact with which units of sample, but instead of that information may be gathered by establishing contact with any other alternative units, still units selected through random sampling cannot be changed.

(d) If all units of universe are not of the same size and they lack uniformity, then representative units cannot be selected through random sampling method. In such situation this method is not useful.

## Essential Conditions

As per Parton, following things should be kept in mind while using random sampling:

*(i)* All units of universe must be clear and their list must be ready

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*(ii)* Size of units must be approximately same

*(iii)* Each unit must be independent of each other

*(iv)* Each unit must be accessible to the researcher.

*(v)* Selected unit should neither be left nor should it be replaced.

## 2. Purposive Sampling

When researcher, keeping a purpose before him, knowingly selects few units, it is called purposive or deliberate sampling. The main basis of such kind of sample selection is that in it researcher by getting pre-acquainted with the aspects of the units of universe elaborately selects the samples. Basis of selection is the purpose of study and keeping the purpose in front, according to it researcher selects the most representative units from the complete area. In such selection, considering the purposes as their guide, because of doing a thoughtful selection for achieving the objective, it is called purposive sampling. Adolph Jenson has written, "by purposive sampling it is meant that select a number of units of universe in such a way that selected group collectively provide the same average or ratios related to those attributes which are there in the universe and whose statistical knowledge is there beforehand only."

**Characteristics of Purposive Sampling**

1. Researcher is acquainted with the attributes of all the units of the universe so that he knows beforehand that which unit has which attribute and on that basis, by selection of which units, purposes of study can be easily achieved.
2. In purposive sampling, selection of sampling is done by keeping any specific objective in front. All objectives cannot be achieved through purposive sampling. Still achievement of so far as possible objectives is the target of such selection.
3. In this method, since the researcher selects the sample as per his desire, that is why there is more possibility of bias.

**Merits of Purposive Sampling—** we can mention the below mentioned merits of purposive sampling

(a) It is less expensive because in it size of samples is not very big. Its belief is that if samples are selected without bias then comparatively small sample can be representative.

(b) It is very useful in those researches in which some units of universe are especially important and that is why their selection is required. This requirement cannot be fulfilled through random sampling. For e.g. if educational institutions of Rohelkand district have to be studied, then inclusion of Bareily college in sample is necessary. But if we are adopting random sampling method, then in selection of sample Bareily college may be named or may not be named. In such situation, purposive sampling method will only be useful.

## 3. Stratified Sampling

**Hsin Pao Yang** has written, "meaning of stratified sampling is taking sub-samples from the universe who have common attributes like types of farming, size of farms, ownership of land, education-level, income, gender, social class etc. Such samples coming under sub-samples are taken collectively and stratified in form of type or class." In a more clear way, we can understand stratified sampling in this manner- for selecting such kind of sample; researcher firstly obtains the elementary knowledge about all attributes of the universe. On the basis of this knowledge, he divides that universe in some classes or sub-samples so that each class represents only one attribute (like education level, income,

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religion, social class, gender etc.) of the universe. In other words, on the basis of common attributes or aspects, by dividing the units of universe in various sub-samples or classes, first an attempt is made to bring homogeneity in the universe. Considering the attributes of the universe and keeping in mind that problem of research, researcher may easily decide that on what basis and in how many categories, division must be made. After dividing the universe in categories in such a manner, with the help of any appropriate method of selecting random sample, samples are selected in appropriate number from each category. While selecting type sample from each category, it must be kept in mind that as far as possible, only that much units are selected from each category, in which ratio total units of category are there in the universe. For e.g. if in a universe, teachers are 120, engineers 10, doctors 30 and lawyers 50 and if we have to take out 10 percent sample, then we will select 12 teachers,1 engineer, 3 doctors and 5 lawyers as sample with the help of any one method of selecting random sample. In this way, in stratified sampling help is taken of method of selecting random sample also, which is why it is often called stratified random sampling.

**Kinds of Stratified Sampling—**stratified samples are of three types: - **a.** Proportionate—in it from each category units are selected in the same ratio in which ratio total units in the category are with the universe. **b.** Disproportionate—**in** it equal numbers of units are chosen from each category. No matter how many numbers of units are there in any category of universe. This means that if in various categories, units are not in equal numbers, then, in sample their number will be disproportionate. **c.** Stratified Weighted Sampling—It is a mixed form of the above given two types. In it equal numbers of units are selected from each category but afterwards, units of categories of more numbers are provided weight and their impact is increased. This weight is increased in the same ratio in which ratio units of the category are there in the universe.

**Merits of Stratified Sampling—**in such kind of sampling, following attributes may be mentioned:

(a) In it units of each category of universe get a place in sample and there is no possibility of negligence of any important category. Though in random sampling there is equal possibility of each unit being selected, still some times some important category or unit is left out. Stratified sampling prevents this possibility.

(b) In it if various categories are divided carefully, then from various categories small number of units may also represent the universe. In random sampling attribute of representation is achieved only when units are selected in sufficient numbers.

(c) In it there is a facility of discarding any unit and selecting some other units in its place, if need be. If in initially chosen sample any person or representative is such that it is not possible to establish contact with him, then in its place from the same category, some other person or unit may be selected. With such kind of change there is no obstacle in sample remaining representative.

(d) Category division can be done on geographical basis also. By categorising from the point of view of area, time and money is saved and it is easy to contact the units. In random sampling no such control can be there and selected units may be wide-spread.

**Defects of Stratified Sampling—**despite of above-mentioned merits, stratified sampling has some defects also-

(a) If division of categories is not done properly there may be false inclination or bias created in the sample. In sample selected in that manner, units of any category may be too many or too less in number and in this case, sample does not remain representative.

(b) If there is too much difference in size of various categories, then selecting units in equal ratio will be difficult and in this manner, if sample is not proportionate, it cannot be representative also.

(c) If selection of units of category is done on disproportionate basis, then afterwards, use of weightage has to be done. In this task, researcher's false inclination or bias may leave their impact.

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(d) It may also happen that in a unit such mixed attributes are present that it becomes difficult to decide in which category should it be kept. In such situation despite categories being made, division of units is a problem.

**Precautions—** While selecting stratified samples, following things should be taken care of:

*(i)* Sub-samples or categories that are created, their size should be sufficient so that from them units may be chosen through a method of selecting random sample.

*(ii)* General knowledge of researcher about the universe should be at least such that he should know which attributes are there in the universe, based on which universe is divided in categories or sub-samples.

*(iii)* Categories must be created in such a way that there is homogeneity in all the units coming under the category and they represent only one attribute of the universe.

*(iv)* As far as possible, only as many units must be selected from each category in which ratio of total units of the category are there in the universe.

*(v)* Categories must be clear and definite so that all units of the universe come under some or the other category and no unit falls in more than one category.

*(vi)* Bases of creation of various categories should be the nature of study-subject. As is the problem or subject, according to that only universe should be divided in various sub-samples.

## Other Types of Sampling

Other than the above-mentioned three main types of sampling, a few other types of samplings may also be mentioned here:

**4. Multistage Sampling—** It is used in selection sample from very big study-fields. It is also called multistage sampling because in it process of sample selection passes through many stages. These stages are mentioned below:

(a) In first stage, complete study-field or country or province is divided in homogenous areas. As far as possible, these areas must be of equal area and there should be maximum similarity in residents of each area.

(b) In second stage from each area few villages or cities, that need to be studied, are selected on the basis of method of selecting random samples.

(c) In third stage from each village or city selected in second stage, few family groups are selected on the basis of method of selecting random sample.

(d) In the last stage, from the above selected family groups, few families are selected through the method of selecting random sample.

In this way it is clear that multistage sampling is a mixed form of stratified sampling and random sampling and if sufficient precautions are taken then in it, benefits of both the above methods can be obtained.

**5. Convenience Sampling—** It is clear from the name of convenience sampling that in it researcher selects the sample as per his convenience. Researcher, before selecting the sample, keeping in mind subjects like the availability of money, time, source list, capability to establish contact with the units etc., as is the facility as per that selects the sample. That is why it is also known as irregular, incidental, opportunist sampling. It is quiet unscientific because in it bias or false-inclination may enter to any extent. Still while studying very big fields, its support is only taken. When there is no complete knowledge about the universe, when units of sample are not clear and when complete source-list is not available then such kind of sampling becomes useful.

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**6. Self-selected Sampling:** When the related person (whose study has to be done or who is the informant) himself becomes a unit of sample by giving his name and researcher does not have to select him, then he is called self-selected. For e.g. if any institution has to find out that how much did people like a specific radio programme then it can make an announcement done that those who will write and send their choice their name will be announced on the radio. In this way people sending their opinion will only become a part of sample.

**7. Area Sampling:** Area sample is that sample which is selected by the researcher as per his convenience and decision, from various small areas and complete study is done of all the residents of that one area. Now-a-days, such kind of sample is being used quite a lot.

## 2.3 Summary

- As per **P.V. Young, "**a statistical sample is a smaller picture of complete group or unity from which sample is taken**".**
- Research facts can be collected in two ways—(1) through census method (2) through sampling method
- In attributes of a perfect sample, there must be neutrality.

## 2.4 Keywords

1. **Sampling:** Selection of few units from the universe for study is called sampling.
2. **Random Sampling:** In this method, researcher's inclination is not towards any special unit, but the entire process of selection is left on chance and randomness.

## 2.5 Review Questions

1. Explain the attributes of a perfect sample.
2. Give a summary of types of sampling.
3. Describe the merits of purposive sampling.

## Answers: Self Assessment

1. Dissimilarity 2. Represent 3. Represent

## 2.6 Further Readings

*Books*

1. Social Survey and Research—Vandana Vohra, Radha Publication.
2. Law Sociology—Dr. Ganesh Pandey, Arun Pandey, Radha Publication.

# Unit-3: Questionnaire Construction, Mailed Questionnaire

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CONTENTS



## Objectives

After studying this unit students will be able to:

- Understand the meaning and objective of questionnaire.
- Understand the characteristics of a good questionnaire.
- Understand the importance of a questionnaire.

## Introduction

In social research, for compilation of primary facts today, use of questionnaire is increasing day-by-day. This method is easier and cheaper as compared to other methods. At present, because of the development of means of transport and communication, study of people settled in remote locations has become easier through the use of questionnaire method. When informant is literate, huge and detailed, then studying though this method proves useful. Many a times it happens that the subject or problem we want to study, people related to it are widespread in a large area, for studying whom through observation or interview, much time and money is required and information also does not get compiled quickly. In such situation in order to save time, labour and money and for quickly obtaining the information questionnaire method may be used. It can also be used for obtaining initial information about the subject.

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Questionnaire is a list of many question related to the subject or the problem, which researcher sends to the informant through mail and informant returns it after filling it. Since questionnaire is sent to the informant through mail, hence it is also be known as mailed questionnaire. Many a time it may also be distributed among the people. At present questionnaire method is used quiet a lot for public poll, market survey and social financial survey etc.

## 3.1 Meaning and Definition of Questionnaire

Various scholars have defined questionnaire as follows:

As per Pope, "a questionnaire may be defined as a group of questions which informant has to answer without the personal help of a researcher or an enumerator."

*Notes* As per Bogards, "questionnaire is a list of questions sent to be answered by various people".

As per Goode and Hatt, "generally, by the word questionnaire "in general, word questionnaire refers to a tool to find answers to questions, in which a form is used which the respondent fills himself."

As per Wilson Gee, "questionnaire is a convenient process of obtaining information in a limited amount, from people in large numbers or from a smaller group, whose members are spread in a detailed area."

As per Hsin Pao Yeng, "in its easiest form questionnaire is such a schedule which is sent by post to the people selected as sample.

From the above-mentioned definitions it's clear that questionnaire is a list of questions related to any study subject, which is sent to the informant through post and which the informant fills himself and returns.

## 3.2 Objectives of Questionnaire

Mentioning the objectives of questionnaire method Garden Kept has written that questionnaires are built for accurate transmission and accurate answers. Correct transmission is only possible when informant understands the purpose of study and accurate answers can also be obtained when, desired information is obtained and help is received from them in making the table and analysing the subject. The main objectives of questionnaire are as follows: 1. Compiling information from people spread in wide, huge, diverse and expansive form.2. Compiling authentic and credible information 3. Systematic compilation of information. 4. for subjective study. 5. for leaving unnecessary facts. 6. Less expenditure 7. Quantitative titration 8.Simultaneous and quick compilation of information.

## 3.3 Types of Questionnaire

On the basis of formulation of questions, subject-matter, nature of questions etc, questionnaires may be divided into various types. Which type of questionnaire should be used where, this depends a lot on the characteristics of the respondent and area. Lundberg, P.V. Young, Goode and Hatt, Selitz, Jahoda and their associates have mentioned the various types of questionnaires. P. V. Young, on the basis of nature of questions has mentioned open or closed questionnaires, on the basis of structure of

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questionnaire has mentioned structured or unstructured questionnaire. Other scholars have mentioned pictorial or mixed questionnaire. We have mentioned various types of questionnaires in short.

**1. Factual Questionnaire:** This questionnaire is used for compiling facts related the social-financial conditions of any group. When we want to compile information related to income, age, religion, caste, education, marriage, occupation, family structure indebtedness etc, then such type of questionnaires are used.

**2. Questionnaire of Opinion and Attitude:** When we want to know the interest, opinion, view, ideology, faith, and point of view of the informant about any subject, then we use such questionnaire. Such type of questionnaires is used for market survey, compiling public opinion, advertising and knowing the view of people about television and radio programmes.

**3. Structured Questionnaire:** Such types of questionnaires are developed before starting the research itself. In it language of questions, words, statements etc are decided beforehand itself. In it researcher or interviewer does not have the liberty to make changes during the research. In it, order of questions is also predetermined. Main objective of such type of questionnaire is to obtain answers in determined and homogenous form. Defining structured questionnaire P.V. Young writes, "Structured questionnaire is that in which other than definite, solid and pre-determined questions, such essential limited questions are also there which are important for clarification of insufficient answers or for obtaining more detailed response. Type of question, whether it is closed or open, important point is that those questions are beforehand, and not like an interview, given in written form." when answers given by respondents are insufficient, vague, and incomplete interviewer is given the liberty to ask other questions. Such kind of questionnaires are used in fields where formal investigation has to be conducted, imaginations has to be created on their basis, primary facts have to be compiled, or compiled facts are retested. Such types of questionnaires are also used when study areas are very wide so that uniform answers may be obtained of the questions. Through such kind of questionnaires, social–financial incidents may be studied. Structured questionnaires are also used for knowing the opinions of people on any subject, for study of administrative policy or change, social health, public welfare policies, conditions of people's lifestyles and collecting information about income–expenditure etc.

## Self Assessment

Fill in the blanks:

1. This questionnaire is used for compiling facts related the social-financial _____ of any group.
2. When we want to know the interest, opinion, view, ideology, faith, and point of view of the informant on any _____, then we use such questionnaire.
3. When answers given by respondents are _____interviewer is given the liberty to ask other questions.

**4. Unstructured Questionnaire:** In unstructured questionnaire, questions are not built beforehand, but only those topics and subjects are mentioned about which information has to be compiled. In this way, unstructured questionnaire is similar to interview guide. Clarifying this P.V. Young has written, "unstructured questionnaires are often targeted as interview guides whose objective may be to keep the definite subject-matter areas and accuracy which is needed to be included during the interview. Interviewer is free, remaining in his limits, to organise the size and determining the time of inquiry." In questionnaire, interview does not happen because they are sent through post. Hence, unstructured questionnaire is a form of schedule only. Such kind of questionnaire is used for psychoanalytical interviews, and for informal and intense studies. The main attribute of unstructured questionnaire is its flexibility i.e. in it researcher may bring changes in methods of research.

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*Did You Know?* In structured questionnaire respondent is tied to answer only where as in unstructured questionnaire respondent may express himself freely

Such kind of questionnaires are used more to know the faiths, point of views, and thoughts of the respondent.

**5. Closed Questionnaire:** In such kind of questionnaires some definite optional answers are written before the questions itself and the respondent has to select answers from them only. In such kind of questionnaires, answers to the questions are limited. Hence respondent does not have the liberty to give independent opinion nor does he have to think a lot for giving answers, but they have to select from the pre-determined answers only and mark before them. Such kind of questionnaires are used for obtaining sorted information. As per Hsin Pao Yeng, "in closed questionnaire often answers are given according to the head of questions asked." In such kind of questionnaires, in answering, respondent has the convenience. Mostly he has to answer only in 'yes' or 'no' and he is freed of the complexity of answering. Possibility of such questionnaires getting filled and returned is also more. Some examples of questions in such questionnaires are mentioned below:

1. Are you a student of scheduled caste? Yes/no
2. Are you in favour of widow remarriage? Yes/ No
3. What kind of relationship do you have with your teachers? (A) sweet (B) normal (C) tensed

In such kind of questionnaire, convenience is there in classification of material.

**6. Open Questionnaire:** In such types of questionnaires respondent has the freedom to express his thoughts openly. In questionnaire, possible answers of the questions is not given, instead it is expected from the respondent that he answers as per his desire. Sometimes there are many possible answers of a question, to obtain which only such questions are developed. In questions of such questionnaires, lot of flexibility is found, whose answers, respondent expresses in his own words. Open questionnaires are used for knowing personal thoughts, feelings, suggestions etc, for doing intensive studies, for compiling primary knowledge related to the subject. For obtaining descriptive and qualitative information also such questionnaires are used. In it little space is left before the questions for giving the answer.

*Task* In your view, what changes should be brought in the present education method?

**7. Pictorial Questionnaire:** In such kind of questionnaires, possible answers of questions is expressed through pictures and respondent gives his answer by selecting from those pictures only and marking them. Because of the pictures, questionnaire becomes interesting and attractive because of which respondent gets inspired to give the answer. In modern time everyone is busy in their jobs, they do not have the time to give answers to long questions. In such situations, for easily obtaining answers from the respondent in little time and effort, pictorial questionnaire is used. Language of such questionnaires is also understandable to common man. Such questionnaires prove much useful to know the psychologies of children and for dumb and deaf persons. Examples of such questionnaires are as follows:

a. What is the size of your family?

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Similarly to know that where will you like to live—in a village or a city. To know its answer pictures of village and city are made. Investigation and classification of answers of such questionnaires can easily be done.

**8. Mixed Questionnaire:** Such questionnaire carries the characteristics of all the above-mentioned questionnaires. Primarily it has the mixture of closed and open questionnaire. Mostly questionnaires are of this type only. In social research nowadays, use of this type of questionnaires is increasing because developing it is convenient and through it important information are easily compiled. Regarding any social fact, it is not possible to know information through any one type of questions only, hence as per the requirement, open and closed, pictorial or structured and unstructured questions are developed. Such questions are useful for both less and more educated and are helpful in knowing the independent thoughts of the respondent along with clear and exact answer.

## 13.4 Characteristics of a Good Questionnaire

A.L Bowley has mentioned the following characteristics of a good questionnaire:

1. From comparative point of view, number of questions should be less.
2. Those questions that have been answered in 'yes' or 'no', they must be included.
3. Questions must be easy and quickly comprehensible.
4. Questions must be formulated in such a way that while answering one can be saved of bias.
5. Question should not be vulgar, irreverent or tentative.
6. As far as possible, question should be such doing mutual confirmation.
7. Questions should be such in which desired information can be obtained in evident form.

Agel Burner has mentioned to take care of the following points while developing a questionnaire:

1. Which kind of information have to be gathered, to determine this, subject should be expansively described.
2. To write the answers to the questions, as per the requirement, blank space must be there before each question.
3. Such questions should not be asked, answering which, respondent has an objection.
4. Questions must be arranged from logical point of view.
5. Must be saved from long-long questions.
6. Questionnaire should possibly be brief.
7. Questions should be easy and straight which the respondent may understand easily.
8. Language of questions must be easy and clear.
9. Questions should not be such that hurt the feelings of respondent.
10. While creating a questionnaire attention should be paid on its material aspect also, i.e., size of questionnaire should not be too big or small, colour of the paper should be attractive, printing should be beautiful and clear etc.

## 13.5 Pre-testing of Questionnaire

After developing the questionnaire, before actually using it and sending it through the post to the respondents, it must be tested in a small sample area so that if there are any flaws in the questionnaire, they may be improved. No matter how much precaution is taken in creating the questionnaire and

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support is taken from no matter how experienced a person or literature, still possibility of flaws in it cannot be denied. Hence, it is important that questionnaire is pre-tested. Through it we will know that whether the respondents are able to understand the correct meaning of the questions or not, how do they interpret them, length of the questionnaire, subject–matter, what kind of amendments are needed in language style etc. many a times, after the distribution of questionnaires, their flaws are known. Hence, it is important that it is seen by testing them beforehand that there is no shortcoming in its structure or wordings. Sleto has written, "in short, process of pretesting provides the means of taking out errors on operation before they impose huge penalty in form of negligible amount of authentic and credible answers and answers coming in less ratio. Pre-testing is essentially a process of trial and error in which successful tests are repeated and when questionnaire is finally sent to the final group, errors are removed from it."

*Notes* Whatever errors are known on doing pre-testing, to remove them, changes and amendments should be done in the questionnaire. if errors are too many, questionnaire should be re-built.

Uses and merits of pre-testing are mentioned below:

1. Through pre-testing, we get to know those questions whose answers, respondents do not know and in whose answer they write sentences like 'not known' or 'I don't know' etc. This flaw may be removed thought appropriate questions.
2. Through it fault in order of questions is known.
3. If options given in answer to the questions are less then it is known and required options are added.
4. Those questions are known answering which, respondents do not consider being important and places for answers are left blank.
5. Questions that prompt more than necessary conditions or uncalled for criticism are known.
6. Unnecessary and unrelated questions are known.
7. Through it capacity and eagerness of respondent is known.
8. Authenticity and credibility of questionnaire is increased.
9. From the point of view of tabulation, appropriate headings and facts are obtained.
10. As a result of it number of responses increase.

For pre-testing it is important that ***(i)*** initially questionnaire is printed in less quantity. ***(ii)*** the area that needs to be studied, from it a small sample is chosen and only to it questionnaires are sent for pre-testing. ***(iii)*** pre-testing is done in form of personal interview ***(iv)*** questions which are not replied correctly, they are amended or left out.

## Accompanying Letter

After doing the pre-testing and giving the final form to the questionnaire, questionnaires are sent through post for data compilation. Along with it a letter is also sent by the institute or person doing the research, which is known as accompanying letter. In this letter, respondent is given the introduction of institution doing the research, he is told the subject and purpose of research and a request is made

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to fill and return the questionnaire in a definite time. It is said to the respondent that research work may be completed only with your support. Letter may be typed, printed or cyclostyled. Letter must be printed clearly and on an attractive paper so the respondent is attracted. Letter only works as a link between the respondent and researcher, brings them closer to each other. Heading of letter should be in bold letters reading which the respondent understands the case. Language and vocabulary of letter should be chosen carefully reading which, respondent should get ready himself to provide the information. It should also be written in the letter that the information provided by you shall be kept secret, they will not be misused and they will not be printed publically. At the end of the letter gratitude must be expressed towards the support of the respondent. Letter should be brief, attractive and impactful. For obtaining quick response, along with accompanying letter, reply envelops with ticket must also be sent. It has a psychological impact on the respondent and he is able to understand the importance of filling and sending back the questionnaire.

## 3.6 Methods of Preparing a Good Questionnaire

In modern times, in social research, for compilation of facts, use of questionnaire is increasing day-by-day. Throwing light on its importance, Wilson Gee has written, "it is a convenient method of obtaining some limited information from a big group of people from a small selected group of people scattered more widely." Catherine Godern Capt has also written, "Through questionnaire along with objective and quantitative facts, knowledge of developing information of qualitative nature can also be obtained." We can express the characteristics, merits, uses or importance of questionnaire methods under various heads in the following manner:

1. **Study of Large Population:** The biggest merit of questionnaire method is that through it we can do a study of population of a large and widespread area by spending less time, money and effort. For study of large population through other methods more money, time and labour is required. Throwing light on its usefulness, Hsin Pao Yeng has written, "questionnaire provides a fastest and easiest method of compiling information from a group of people spread in a large and expansive area."
2. **Minimum Expenses:** Questionnaire method, in comparison to other methods is a less expensive method of study. Study of a large area is done in a short expense on paper, printing and postage expense. Because of the non-requirement of field workers in this field, expense on their wages and allowances and organization related expenses are not required.
3. **Minimum Time:** Questionnaires are printed and sent simultaneously by post to all the respondents, which are soon filled and returned. As against it, in interview, observation or schedule method, researcher has to personally contact the respondent for which more time is required, if area is wide spread then more time is required while questionnaires may be sent simultaneously and in some time, most are returned with answers.
4. **Minimum Labour:** For doing study through questionnaires, we do not need investigators. Questionnaires may be sent and received through a central office only. For their tabulation, scheduling, sampling, inferencing and preparing the report also many people are not required.
5. **Repetition Possible:** Some researches are such that for them we need to collect information again and again after some time, then this method is only much useful. Many copies of questionnaires are printed and kept which are sent to the respondents from time-to-time.
6. **Convenient:** Questionnaire method is an easy and convenient method of compiling information because respondent may fill it whenever he gets the time according to his convenience and interest. Researcher also need not determine the time of interview with the respondent.

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7. **Free and Valid Information:** Since while filling the questionnaire researcher is not present before the respondent, hence he may express his thoughts openly and independently. The impact that happens on the respondent of the presence of the researcher and the possibility of bias that is there, is also prevented in this method. In this way, information received questionnaires are credible, authentic and un-biased.
8. **Self-administered:** For receiving information through questionnaires, researcher need not be present in the field nor has he to be entangled in the issues of any kind of organization or arrangement. He is freed from the selection, training, organization and administration of investigators. After sending through post, questionnaires themselves come back filled duly. That is why this method is self- administered and organized.
9. **Statistical Treatment Possible:** Bogards has written, "in it modulated results are obtained which can be used in tabulated or statistical form." From this statement it is clear that classification, tabulation and categorisation of information received through questionnaires is easy and for obtaining the results, statistical formulae may be used upon them.
10. **Comparative Study:** Through questionnaire method, results of various investigators may easily be compared mutually because in questionnaire method during the research due to the absence of researcher, information are usually unbiased, homogenous and credible, comparing which is possible.

## 3.7 Demerits (Limitations) of Questionnaire Technique

Despite the many advantages and merits of questionnaire method, it is not free from the demerits. Telling it disadvantages F.L. Vitini has written, "questionnaire is perhaps the most polluted methodology." Main demerits or limitations of questionnaires are as follows:

1. **Inappropriate for Uneducated:** Use of questionnaires may be done only for educated people because respondent has to himself read it and fill. In our country where percentage of illiteracy is more, there its use may be done in limited amount only.
2. **Problem of Response:** Questionnaires get returned in very less numbers or respondents do not show haste in returning them duly filled. The reason is that most respondents are careless, unwilling and lazy, some are unable to understand the purpose of survey, and they lack time or do not know to answer the questions or do not want to write the personal facts themselves. In such situation, very little questionnaires are returned back.
3. **Incomplete Information:** Many a times in questionnaire, main questions are not answered. When respondent is not able to understand the information questions or do not want to give secret information, then they knowingly dismiss such questions or possibility of question s being left out is also there while filling carelessly or hastigly. In this way, information compiled through questionnaire method are insufficient and incomplete.
4. **Dirty and Illegible Writing:** Respondent fills the questionnaire himself and handwriting of everyone is not beautiful. In such a situation reading and understanding the received information becomes a problem. Cutting and over-writing, dirty and carelessly written letters cannot be read, hence received information cannot prove to be useful.
5. **Representative Sampling Impossible:** Sample selected for study through questionnaire method does not do a complete representation of the area because in an area both the literate and illiterate people are there, but questionnaires may be used only for literate people. Hence, generalising in relation to universe in subjective way is not possible.
6. **Lack of Emotional Stimulation:** In questionnaire method, there is no face-to-face contact between the respondent and investigator. Hence they are not able to properly understand each other's thoughts nor is the researcher able to emotionally inspire the respondent to fill the questionnaire. Hence, it remains to be a mere formal method only as a result of which incomplete and insufficient information are gathered.

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7. **Impossibility of Uniform Questions:** Sufficient variance is found in the nature, thought-process, principles, socio-economic conditions, cultural background and education levels of the respondents. Hence, it is difficult to create such a questionnaire which is meaningful and practical for everyone and which can be applied on all in a universal manner. In such a situation it is natural for the inferences to be different.
8. **Deeper Study Impossible:** Through questionnaire, deep study of subjects cannot be done because first, there is lack of time, second, because of the absence of investigator, information cannot be probed and asked nor emotional inspiration may be given. Hence, through it only rough facts and superfacial information may be gathered.
9. **Lack of Reliability:** Information obtained through questionnaire are not considered to be completely reliable because, due to the absence of investigator many a times informant is not able to understand the questions or understands them incorrectly, answers received in such conditions cannot be called reliable and credible.
10. **Lack of Assistance of Investigator in Answering the Questions:** Many times in questionnaire method, respondent is incapable in understanding few questions, for explaining which investigator is not present. In such a situation, answers to those questions are either left out or are written wrongly.

## 3.8 Examples of Questionnaire

There are two main parts of any questionnaire, in first part information about the respondent is collected, like his name, age, address, income, education, caste, religion, occupation etc. in second part, questions are asked about the study problem. For e.g. we are presenting a questionnaire related to child-crime.

### Questionnaire for the study of child criminals

1. Name _____
2. Permanent address _____
3. Age _____
4. Caste _____
5. Religion_____
6. Education _____
7. Occupation _____
8. Monthly income _____
9. Marital status _____
   Unmarried/Married/Widow/Widower/Divorce
10. What is the size of your family?

| Order number | Name | Relation with the respondent | Age | Education | Income |
|---|---|---|---|---|---|
| | | | | | |

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## 3.9 Summary

- As per Bogards, "questionnaire is a list of questions sent to be answered by various people".
- After developing the questionnaire, before actually using it and sending it through the post to the respondents, it must be tested in a small sample area
- Characteristic of a good questionnaire is that questions are easy and comprehensible.

## 3.10 Keywords

1. **Questionnaire:** It is a list of questions related to any study subject which is sent by post to the respondent and which respondent himself fills and returns.
2. **Accompanying letter:** A letter is sent by the institution or person doing the research, which is called accompanying letter.

## 3.11 Review Questions

1. Tell the characteristics of a good questionnaire.
2. Tell the types of questionnaires.
3. What are the merits and limitations of the questionnaire method?

## Answers: Self Assessment

1. Condition
2. Subject
3. Insufficient, vague, and incomplete

## 3.12 Further Readings

*Books*

1. Research Procedure—Dr. Ganesh Pandey, Arun Pandey- Radha Publication.
2. Sociology of Education—Tiwari Sharda, Arjun Publishing House.

# Unit-4: Interview

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## Objectives

After studying this unit students will be able:

- To acquaint themselves with the concept of an interview
- The knowledge about how to take interview of a person?
- The knowledge about objectives, merits and demerits of objectives.

## Introduction

In most prevalent methods of social the research, possibly this method has the topmost place. The chief attribute of this method is that in this researcher may talk to his study, object-person by establishing a face-to-face relationship and in this manner, can do a sequential study of feelings and attitudes of human beings.

## 4.1 Interview

English word interview is made of two words—'inter' meaning 'internal' or 'inside' and 'view' meaning 'eye' or 'to see'. The joint meaning of both the words is 'internal view' or 'internal eye'. In both the words those unobvious or invisible facts which could not be investigated in external form, to attain the knowledge of those facts is only called interview. Various knowledgeable men have defined interview in below mentioned way:

As per C.A. Major, "a survey interview is a conversation between interviewer and respondent, objective of which is to attain definite information from the respondent.

In the words of P.V. Young, interview may be considered such a sequential methodology through which a person enters the internal life of another person in a little bit imaginary manner, which normally is comparatively unfamiliar for him.

As per M.N. Basu, "an interview may be said to be a face-to-face meeting of persons regarding a few subjects".

As per Cin Payo Yeng, "interview is one such method of field work which is brought in use to see the behaviour of person or persons, write the statements and to investigate the actual results of social

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or collective inter working. Hence, it is such a social process in which inter-working between two persons is involved."

Goode and Hatthas basically considered interview to a process of social inter-working. Hayder and Lindman have considered interview to be a conversation between two or more people in which oral reply and counter reply is there. Pamar has considered interview to be a psychological process in which reply and counter-reply happens between two persons. Luther Fry's view is that interview is a matter-collection process; it is nothing more than a conversation for some definite objective. In it two or more persons, mutually finding motivation from each other, do reply and counter reply.

*Notes* Interview is such a process in which two or more than two people, keeping a specific objective before, do a face-to-face dialogue, conversation and reply- counter reply. It is a psychological process in which interviewer studies the feelings, thoughts, psychology and internal life of the respondent. It is a social process also.

## Characteristics of Interview

Based on various definitions of interview, below mentioned characteristics of interview are revealed-

1. For interview it is important to have two or more than two persons who do a mutual contact, conversation and inter-working.
2. In these persons, one person takes the interview and the other is the respondent.
3. Interview is a social process
4. Interview is a purposeful conversation.
5. It is also a psychological process.
6. In interview, face-to-face and primary relations get established between both the parties.
7. In interview, compilation of information and facts related to study subject is done by the researcher.
8. Interview is an oral method of information compilation.

## Objectives of Interview

Below mentioned are the main objectives of interview:

1. **Information through Direct Contact**: In interview, between two people, face-to-face direct and primary relations are established and in such situation, researcher compiles from the informant, important information related to the subject. Researcher, because of his presence, motivates the informant to give the information, they both converse openly, and informant provides internal information. In this manner, through direct contact, researcher receives the information about internal feelings, emotions, psychologies, beliefs and desires of the informant, which is normally not possible through any other method except interview.
2. **Source of Hypothesis:** one objective of interview is to receive the required material for building hypothesis. During interview, new knowledge is inaugurated about the people and groups, new fields are known, knowledge is received about the feelings, psychologies,

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thoughts and aspirations of people, useful experiences are received in relation to persons and collective life which are used for building of new hypothesis**.**

3. **Personal Information:** Objective of interview is also to find out personal and internal information from the life of people. Such information which P V Young call as 'picture of human personality and which are important from the view of personal study, can also be received through interview only.
4. **For Qualitative Information:** There are such qualitative information related to human life such as feelings, psychologies, emotions, aspirations, thoughts, folk-beliefs, attitudes, values, principles, interests etc whose study is possible only through interview. We cannot express these in numbers.
5. **Opportunity for Observation:** Through interview, along with finding the knowledge of personal information, opportunity is also found for observing the behaviour of person and many thing of life. In this manner, in interview merits are found of both- the observation and interview.
6. **Verification of Information Received through Other Methods:** One of the objectives of interview is also to find the credibility and authenticity of the information received through questionnaires, observation and other methods. Many a times some facts do not get clear through questionnaires and observation, then, they are made clear by asking from the informant through interview.
7. One of the objectives of interview is to find out various thoughts and other information about the problem.
8. Through interview, causes responsible for any incidence are searched for. Co-relations and effective causes of those causes are also found out.

## Types of Interview

Various knowledgeable men on the basis of objectives of interview, duration, field, formality, based on humanitarian approach, number of people participating etc. have mentioned about the types of interview. We will discuss about the various types of interview:

## 1. On the Basis of Purpose

1. **Diagnostic Interview:** Objective of this kind of interview is to find out the cause of any social problem. Just as a doctor makes inquiry from the patient to know the cause of the disease, in the same manner, to know the causes of social problems and incidences, researcher interviews the informant. For e.g. interviews done to know the cause of problems like crime, child-crime, unemployment etc. are diagnostic interviews.
2. **Treatment Interviews:** Just knowing the causes of social problems do not provide the solution to the problem, whereas, suggestions and solutions to solve the problems are also asked from the people. Such interviews are called treatment interviews.
3. **Research Interviews:** Objective of research interview is to search new knowledge and information about social life and incidences. To collect information about the feelings, thoughts, psychologies, value and principles etc. about the informant, such interviews are arranged.

## 2. On the Basis of Number of Informants

**1. Personal Interview:** In such kind of an interview, at a time, one interviewer and one informant converse relating to a mutual subject. In it, interviewer keeps asking the questions and informant

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keeps answering them. In it, informant also receives personal motivation from the informant so that he expresses personal information freely.

**Merits:** (i) Through such kind of an interview, related to the subject, authentic, accurate and credible information can be received. If informant is not able to understand any question or understands it wrongly, interviewer by clarifying its correct meaning may receive the correct information. (ii) In such kind of interviews, those sensitive questions in which there is fear of the informant getting angry or emotional, can be asked with such trick so that his emotions are not hurt and answers are also received. (iii) Interviewer can put forward the difficult language of question in simple words before the informant. (iv) Investigation of information received through such information is possible. (v) In it intensive and detailed information can be received about the subject. (vi) In it there is possibility of establishment of intimate relations.

**Demerits**: (i) In it more time, money and labour is spent. (ii) In it there is more possibility of discrimination. (iii) In it there is a need to establish contact with each informant, which is a difficult task (iv) Arrangement and organisation of such an interview is also a difficult task.

**2. Group Interview:** Under such kind of interview, an interviewer receives at a time, desired and required information from more than one person or a group. He may ask the questions one-by-one from the people in the group or any question may be answered by a leader or any person of the group or collectively. The people in the group may express their consent by keeping quiet or may object or criticise it also. Through such an interview those information are compiled which are related to the entire group.

**Merits:** (i) It is a less expensive method (ii) In it, detailed information can be found. (iii) In it, authenticity and verifiability of received information is possible because of the presence of other people. From them, clarification of incidence can be received. (iv) Through it, data can be compiled from areas of large population. (v) In it there is no possibility of personal discrimination (vi) Through it more information can be collected. (vii) In it less skilled person can also conduct the interview.

**Demerits:** (i) In it lack of secrecy is found. Hence, though such interviews, information related to personal life cannot be attained. (ii) It cannot be used for intensive studies (iii) Many respondents in the group are incapable to understand the questions, hence correct answers cannot be found.

## 3. On the Basis of Duration

On the basis of duration of contact with the informant, interviews can be divided into two categories-

**1. Short-term Interviews:** Some interviews are such in which only little information related to the subject needs to be known and in them answers of some few calculated questions is only found; hence they get over soon. That is why such interviews are called short-term interviews.

**2. Long-term Interviews:** Some problems are such about which intensive and detailed information is needed; for them interviews for long-term are organized which may go on for many hours, days or for months also. Psychoanalysts and psychiatrist use such interviews for treatment of mental patients.

## 4. On the Basis of Structure

Here questions are built before interview or questions are asked in basic form. On this basis, questions are divided in three parts:

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**1. Structured Interview:** In such kind of interview, questions related to study subject are built beforehand and they are kept in an arranged order. Interviewer attains the required information by asking these questions from the informant. This list of questions is called interview schedule. Interviewer asks the questions given in the interview schedule in the same sequence; he does not have the liberty to change it. In it time of interview, duration, circumstances etc, are all predetermined so that the consistency of the interview is maintained. In such kind of interview, control is maintained on both the interviewer and the informant. Such kind of interview is also called arranged interview, directed interview or formal interview. Administrative or various kind of market surveys or to study the voting behaviour such kind of interviews are used. In such kind of interviews, there is no chance if discrimination because questions are made beforehand only.

**2. Unstructured Interview:** Such interviews are also called undirected, uncontrolled, informal or unstructured interviews. In such interviews, interviewer does not have a predetermined list of questions, i.e. questions related to subject are framed instantly. Through such interviews feelings, psychologies, thoughts and principles etc. of the informant are known. In it to guide the interviewer, interview guide is compulsorily used, in which, the kind of subject related information that needs to be attained, summary of it is written. Such kind of interview has been used by the anthropologists for study of primitive tribes. In such interviews high level knowledge and skill of the interviewer is needed. Under it there is more possibility of bentibility and flexibility. In it interviewer collects the information by changing the question according to the situation.

**3. Semi-structured Interview:** such kind of interview is neither completely structured nor completely unstructured, instead in it both are mixed. Subject related few questions are built before hand and few, interviewer asks independently.

## 5. On the Basis of Frequency

Sometimes interview gets over in one time only and sometimes it has to be repeated again. On this basis, interviews are divided into two below mentioned parts:

**1. First or Final Interview:** In such kind of an interview all information is collected in first time itself and there is no need to contact the informant again and again that is why it is called first or final interview. Such interviews are done to get general information about the problem.

**2. Repetitive Interview:** Such kind of interview was used by Lejarsfield**.** When any constantly changing attitude needs to be known and paradigm of development needs to be known, then this method is used. In this information is compiled by meeting the informant again and again after some time. To know the impact of increasing industrialisation on any city such interviews are used. Despite of the many merits of this method, it has certain limitations also, such as, it is an expensive process. It needs more time also. For it, a permanent research institute needs to be built. Along with this, in it, permanent informants are also needed to be searched.

## 6. On the Basis of Contact

On the basis of contact with the informant, interview can be divided in two parts:

**1. Direct Interview:** In such interview, interviewer and informant come mutually face-to-face and talk. In it interviewer may study the facial expressions of the informant by looking at them.

**2. Indirect Interview:** In such kind of interview, interviewer and informant are not in a face-to-face situation. Interview through phone, or interview of *purdah clad* women from behind the *purdah* or collecting information through some mediator are called indirect interviews.

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## 7. On the Basis of Formality

**1. Formal Interviews:** In it beforehand some questions are made and written. Other than these, interviewer does not have the liberty to make new questions or change the words. Such interviews are also called regular, organized or directed interviews.

**2. Informal Interview:** In it interviewer has the liberty to make the questions, change the sequence, make new questions, describe the meaning and change the wordings of the questions. In it, during interview, no help is taken of any kind of schedule. It is also called uncontrolled or undirected interview.

## Self Assessment

Fill in the blanks:

1. Through _____ feelings, psychologies, thoughts and principles etc of the informant are known.
2. To _____ the interviewer, interview guide is compulsorily used.
3. Under it there is more possibility of _____.

## 8. On the Basis of Methodology

On the basis of methodology, interview is divided into below mentioned two parts:

**1. Focussed Interview:** Such interviews were first used by the American sociologists Muturn in 1946 to know the social and psychological effects of public modes of communication such as radio, T.V. , films, newspapers etc. He has mentioned 150 effects of radio on social life. This interview is taken only on those informants who have been related with the study subject. For e.g., after listening to a radio programme or watching a movie, to know its impact, interview is taken of its listener or viewers. Since in this interview is focussed on the effects of any specific incidence, condition or situation, it is known as focussed interview. Below mentioned are its merits:

*(i)* This interview is taken from those people only who have been related to the study subject.

*(ii)* In such kind of interview, support of interview guide is taken, in which subject related facts that need to be known are mentioned.

*(iii)* Such an interview is taken to know the experience, psychology and feelings of the informant towards a specific situation.

*(iv)* In it interviewer cannot affect the answers of the informant.

*(v)* In it a list of questions is prepared by doing a pre-analysis of incidence.

**2. Non-directive Interview:** It is also known as uncontrolled or ungoverned interview. In this, independent questions are asked from the informant about a difficult problem. In this there is no pre-determined schedule of questions nor is there any control on the informant in relation to the answer. In it informant freely gives the information about the subject and interviewer listens to him patiently. If any information is left then other questions are asked only after informant has said everything he wants to. This interview is like informal interview only.

*Task* How many kinds of interview are there? Describe.

## Qualities of a Good Interviewer

**Notes**

Success of interview is much dependent on the interviewer and taking the interview in comparison to science is more an art, as P.V. Young has written, "that is why interview is mostly an art and not a science". Successful operation of interview is much dependent on the capability and tactfulness of the interviewer. Sometimes informants are clever and tricky and sometimes they are half-witted, coward, ones who exaggerate their talks, liars and those who hide facts. Interviewer has to contact all of these and collect information from them, hence it is they who need to have many attributes. A good interviewer should have the following qualities:

*(i)* Personality of interviewer should be pleasant, influential and attractive.

*(ii)* He should have patience and endurance.

*(iii)* He should have the capacity to keep self-control

*(iv)* He should be a tactful, polite and clever person.

*(v)* He should have the qualities of eloquence and quick-wittedness.

*(vi)* He should have mental loyalty and neutrality.

*(vii)* Interviewer should be intelligent.

*(viii)* He should have the capability to quickly take decisions

*(ix)* He should have the quality of adapting according to the time and situation.

## Merits of Interview Method

Interview is one such method through which oral information related to study subject can be obtained. In interview person gets the opportunity for observation also. Through it many qualitative and primary facts can be compiled. Explaining its importance Goode and Hatt have written "interview in modern research has become important for re-evaluation of qualitative interview".

We can express the importance or merits of interview under various heads in the following manner:

**1. Psychological Importance:** Interview is that method through which psychological study of a person is possible. In interview, study of a person's emotions, feelings, beliefs, desires, aspirations, thoughts etc is easily possible. On the basis of facial expressions given by the informant during an interview etc, study of informant's psychological behaviour and mental state can be done. Many mental aspects of informant are revealed during the conversation. In this way through interview, study of psychological facts affecting human behaviour can easily be done.

**2. Securing Information from Persons of all Levels:** Through interview, information may be collected from literate or illiterate and all kinds of people related to various cultures because interviewer can explain the question by understanding their mental level and may obtain the desired answer.

**3. Study of Past Events:** Through interview, past events and their impacts can be studied because some events are such that they cannot be repeated. To know about them we have to interview those people who have seen that event, have been related to it or have been affected by it. for. E.g. what hardships India had to go through to obtain independence, we can know it by interviewing people who have been related to the war of independence.

**4. Study of Abstract Phenomena:** Through interview we can study abstract and invisible phenomena. Study of person's mental state, thoughts, feelings, beliefs, emotions etc. can easily be done through interview. All these abstract facts affect human behaviour, hence, their study is important from the point of view of research.

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**5. Inter-stimulation:** In an interview at least two people (interviewer and the informant) are face-to-face, hence, they mutually stimulate, motivate and affect each other. In this friendly atmosphere both establish friendship with each other. As a result of this, informant reveals secret and important information.

**6. Verification of Information:** In an interview, credibility and verification of information provided by the informant can be done during the interview itself. During the interview, through searchful question and cross-questions, verification of information can be done. Because of his presence, the interviewer can clarify doubtful and unclear things before the informant.

**7. Observation of Events:** During interview, interviewer not only has the facility of asking questions about the event but he can observe many event from his eyes and on this basis, can know the authenticity of compiled information.

**8. Securing Various Information:** during interview many kinds of information can be obtained from various kinds of informants.

## Demerits or Limitations of Interview Method

Despite many merits of interview method, it has some limitations also. We cannot use this method in all kinds of research, and successful operation of interview cannot be expected from all interviewers. Young has written, "interviewer despite being sensible, may be afflicted by faulty internal view, faulty memory, and lack of microscopic view and incapability of clear expression."Hymen has also written "interviewer usually goes to the informant with a definite hope as to in which form will they answer the special questions. Occasionally during the interview itself, on the basis of quick and incomplete answers they hope so." On the basis of these statements, certain limitations of interview are revealed. **Here we will discuss the main demerits or limitations of interview.**

**1. Faulty Memory:** In an interview, information is not written during the interview, hence, memory power of the interviewer has to be depended upon. It cannot be expected from every interviewer that he will be able to remember everything, hence, there is a possibility of forgetting or wrongly, noting some facts. It can also not be expected from the informant that he should remember the memoir of all events of the past. In such circumstance compiled facts are faulty and incomplete.

**2. Possibility of Bias:** In an interview there is a possibility of personal bias, because due to the difference in the thoughts, values, and culture of the interviewer and informant, they infer the same events differently. While the informants connects his emotions and bias while expressing himself, interviewer himself also while receiving them, cannot be saved of the bias. That is why credibility of compiled information is doubtful.

**3. Inferiority Complex:** for interview, interviewer has to approach the informant many a times, sometimes, have to flatter them also. For interview they have to go to many types of people who do all kinds of good and bad behaviours with them, as a result, feeling of inferiority complex thrive in them, their self respect is hurt. Hence many a time he does not compile important information out of powerlessness.

**4. Dependence on Interviewer:** In an interview, compilation of information is completely dependent on the interviewee. Many a time he may misuse this situation of his and forces the interviewer to move around his house. He also tries to defer him by evasiveness. In this way this method is completely dependent on the mercy of interviewee.

**5. Inaccurate Report:** In report written by the interviewer, there is possibility of faultiness coming in because of the incorporation of his personal thoughts and feelings, which is not correct from the point of view of scientific study.

**6. Problem of Expert Interviewer:** Success of interview is dependent on the competence, expertise, training, brain, wit and intellectual loyalty of the interviewer. These attributes cannot be expected from each interviewer.

## 4.2 Summary

**Notes**

- As per M.N. Basu, "an interview may be said to be a face-to-face meeting of persons regarding a few subjects".
- Objective of interview is to find a definite information from the respondent.
- Various knowledgeable men on the basis of objectives of interview, duration, field, formality, based on humanitarian approach, number of people participating etc. have mentioned about the types of interview.
- A good interviewer should have the capacity to quickly take the decisions.

## 4.3 Keywords

1. **Interview Method:** Process of formal conversation organized with a specified objective with a person or a group is called interview method.
2. **Diagnostic Interview:** When main objective of an interview is to find out the cause of any event or problem then it is called diagnostic interview.

## 4.4 Review Questions

1. What qualities should be there in a good interviewer?
2. What is the meaning of interview focussed on methodology?
3. Tell the importance of interview method.
4. Describe the type of interviews on the basis of structure.

## Answers: Self Assessment

1. Interview
2. Guide
3. Flexibility

## 4.5 Further Readings

*Books* 1. Sociology of Education—Sharda Tiwari, Arjun Publishing House.

2. Methodology of Social Research—Dr. Jay Bhagwan, Friends Publications (India).

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# Unit-5: Scaling and Measurement

**CONTENTS**



## Objectives

After studying this unit students will be able to:

- Know the utility of scales
- Know the methods of measuring attitudes.

## Introduction

Scaling methods are the pointers of those processes through which we measure any object or phenomenon or express any of its characteristic in quantitative form. For e.g., if we say that on measurement a cloth is of two meters then we are expressing a characteristic i.e. length of cloth in quantitative form and help other in developing a definite and clear belief about the length of the cloth. Such measurement of material or natural things is easy because for measuring them definite scales have been developed. For e.g. for measuring heat and cold and for expressing the results in degrees, special equipments are there, for measuring fever thermometer, for measuring the length of material things yards, feet, meter etc, special equipments are there for expressing the measurement

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of liquids in diluted form etc. similarly humans are capable in measuring the length, width, height, capacity or weight.

## 5.1 Definition of Scales

For measuring various kinds of things, man uses various kinds of measurements and also gets successful in definitely measuring them. But when the same task has to be done in reference to social phenomenon then it seems very difficult and sometimes impossible because most social phenomenon are abstract, complex and dynamic. For e.g. it is not an easy task to measure qualitative and abstract things like a person's thoughts, viewpoints, attitudes, faiths or beliefs etc. relating to a subject. Still accurate and correct measurement is the symbol of maturity and development of any science. That is why it also becomes necessary for social science that it keeps on trying to make it so capable that abstract social phenomena may also be measured correctly. Hence, in reference to social research by scaling is meant that method of measurement through which qualitative and abstract social facts and phenomenon may be given a quantitative form.

*Notes* Goode and Hatt has written, "Scaling is a method of arranging a series of problem units within processes, under an order."

In other words, scaling methodologies are the processes of changing series of qualitative facts to quantitative facts.

## 5.2 Utility of Scales

Capability of doing accurate and correct measurement is an indicator that how much progress a science has done. This task is not easy for social science because it has to measure abstract and qualitative phenomenons like attitudes, thoughts, and social conditions, social distances etc. their evident and correct measurement is not possible. For e.g. it is not so easy to measure the sentiments of a Brahmin towards harijans as much it to know the weight, length or width of a material thing. Its main reason is that most social phenomenon are not only complex but also dynamic and qualitative. Their nature being qualitative, their objective and quantitative measurement becomes a difficult problem.

*Did You Know?* Job of science is to accept the challenges of problems and obstacles and social science has also done this because without developing capacity to correctly measure the phenomenon it is not possible for social science to maintain its scientific status.

Else also, requirements and utility of scales is for all sciences and in form of a developing social science, for sociology utility of scales is even more. This point will get further clarified by the following description.

**1. For Attaining Scientific Maturity:** The first utility of scales is that they make science so capable that they may correctly and credibly measure the phenomenons coming under their study subject.

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Without it, no science can move towards maturity and progress. Being progressive and developing is a mentionable requirement of each science and it cannot be achieved until scaling methods also do not improve progressively. Goode and Hatt have written, "all sciences march towards maximum accuracy. There are many forms of this accuracy but its basic form is measure of ordered series." This measure can be possible only with the help of scaling methods hence, it is clear that for obtaining maximum accuracy these methods are required.

**2. For Objective Measurement:** In social researches, study of realities of social phenomena and though them drawing realistic and dependable inferences is possible only when we an able to objectively measure a phenomenon. For finding about the actual situation quantitative description is extremely important and this task is possible only with the help of scaling methods. If social phenomenon are not measured objectively then always this fear will be there that social phenomena being qualitative, each researcher will infer them differently because of which in analysis of phenomenon any kind of clarity will not grow inwardly. For everyone to take out similar objective and static inference is possible only when we have a definite method or measurement of measuring various social phenomenon. Hence for objective measurement of social phenomenon also scaling methods are extremely required and this is only there utility or importance.

Material science is more mature and accurate because in it methods of quantitative measures are in quite developed form. But sociology has not been also to do so much of development work on these methods; still there is no lack of effort in this direction. Any science is not able to achieve quantitative accuracy from the beginning itself. As that science is developed quantitative accuracy also goes on increasing because slowly scaling methods also get developed. Same situation is of sociology too. Dr. P.V. Young has written, "though in this field, i.e. in the field of development of scaling methods many tasks are in initial stage, still it may be said in the form of a science as sociology will keep getting matured, there will be more development in existent measuring instruments and many new and more accurate scaling methods will also develop."

## 5.3 Difficulties of Sociological Scaling

Other than the above mentioned difficulties in building measuring scales we have to face some more difficulties in building sociological scales. The reason is the unique nature of social phenomenon. Below mentioned description will clarify the difficulties that come in building sociological scales in reference to nature of social phenomenon.

**1. Complexity of Social Phenomenon:** In making scales for measuring social facts first difficulty stems that social phenomenon are complex. Every social fact is often a result of many causes hence, it gets difficult to decide that in building scales which of these causes must be given the importance. Also all these facts or causes are so much mixed up in each other i.e. so much inter-relation, inter-dependence is found among them that they may not be measured separately.

**2. Abstractness of Social Phenomena:** Second difficulty that comes in developing sociological scales is abstractness of social phenomenon,. i.e. they are qualitative and measuring qualitative facts in quantitative form becomes a difficult problem. Social status, thoughts, love, bias, hatred, attitude etc. all social phenomenons are abstract or qualitative and this is why problem arises that how should they be expressed quantitatively.

**3. Heterogeneity of Social Phenomenon:** Developing sociological scales is also more difficult because much heterogeneity is found in social phenomenon. Various groups are found in human society. Of them each has its own culture, customs, traditions, principles, values, language, religion, faiths, castes; tribes etc. and on these basis only one knows how many sub-divisions are there in them. Other than this, in same group itself on the basis of thoughts of various members, feelings, principles, life values, faiths religions etc. variations are there. The result of all these is that it cannot be completely dependent upon any sociological scale and nor does a scale developed for a group may be applied on another group.

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*Notes* Scale that will be developed for measuring the religious fanaticism of Brahmins, cannot be applied to Harijans.

**4. Changing Nature of Human Behaviour:** Human behaviour is ever changing and along with changes in social conditions, many kind of changes keep emerging in human behaviour also. Regarding a subject whatever thoughts are there today, it may not be said that the same thoughts will remain stable after some days also. Hence, the problem is that any scale prepared in a specific time cannot be applied on other time. By this itself task of building scales becomes very difficult.

**5. Absence of Universal Measurement of Social Value:** There is no public or globally acceptable measure of measuring social values. For measuring the value of financial objects money is a universal measurement. But any measure of this world is not available for measuring social values. Result is that each person and group evaluate the phenomenon in their point of views. This creates various types of variations and complexities, because of which task of developing scales becomes difficult.

**6. Laboratory Method cannot be Applied:** One more mentionable disadvantage of social phenomenon is that for obtaining information about its attributes, laboratory method cannot be used. In such situation, it becomes very difficult to find out relative importance of various facts and without it, scales also cannot be developed easily.

Despite the above-mentioned difficulties, various scales have been developed for measuring social phenomenon and facts and continuous efforts are on in making further progress in this direction. That is why it is being hoped that taking a well-determined measurement of social phenomenon which are considered to be qualitative, complex and dynamic, will be possible in future for the sociologists.

## 5.4 Types of Scales

For measuring social phenomenon and facts, till now a few scales have been developed. It will prove useful to know about them. In this regard, it is memorable that continuous efforts are on to make these existent scales more determined and accurate. Scales that are being used in sociological studies are as follows:

**1. Point Scale:** In such type of scales some specific words or conditions are taken and each is provided a point. Then these words or situations are presented before the informant and regarding whichever word or situation he wants to express his opinion about he puts a mark of cross or tick before it. By knowing the votes of all informants in this way it is calculated and seen that how many votes are received in whose favour.

**2. Social Distance Scale:** Through such kind of scale, social gaps and differences are found between various classes and people. Social distance scales are mainly of two types: a. social distance scale of Bogards b. samaajmiti scale. In Bogards scale some such situations are chosen through which intensity of social distance may be expressed. These situations are placed on the base of intensity and then social distance has to found between whichever groups, that scale is presented before them. Whosoever expresses his opinion in reference to whichever condition, it is noted and in this way after knowing the votes of all the informants' social distances are guessed by applying statistical calculations. In samajmiti scale, which people or groups are to be studied or social distance or closeness has to be calculated on the basis of hatred, love etc, they are each given a chit and are requested that they write the name of those people whom they hate or love the most. On the basis of their answers, social distances or closeness is measured.

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**3. Rating or Intensity Scales:** Through this kind of scales intensity of people's thoughts, passion etc. are measured. These scales prove more useful when regarding any subject there are not only two opposing thoughts but between these two there are other options also. For e.g., regarding a manager, passion of the people of his office may not only be good or bad but some people may consider him to be very good, some people may consider him to be very bad and some may consider him to be average. This liking or non-liking is arranged in an order on the basis of intensity like very good/ good/average/ bad/ very bad. Then passion of various workers is known about this scale and on that basis only it is found out that most workers like or dislike that manager to which extent or consider him of average level.

**4. Ranking Scales:** in this type of scales, conditions or facts are presented in some scales and they are kept in such order that from it, it is known that in comparison to one, how much do the people like the any other.

## 5.5 Measurement of Attitudes

Attitudes can also be measured and this possibility has made attitude a central study subject of social psychology; because in science importance of exactness is more and measurement of which phenomenon is possible, in it possibility of practicality is self-to-self. That is why much emphasis is laid on measurement of attitudes. Also success or failure of many social improvements also depend on the fact that we have a realistic knowledge of the attitudes of people. That is in social, financial, political, business or other fields of life efforts are made to measure the attitudes and employ them. For e.g. before standing in an election candidate must know that what the attitude of the voters towards him and various problems is.

## 5.6 Difficulties in Measuring Attitudes

It is true that measure of attitudes is very important in psychological studies; still the task of measuring attitude is not as easy as we generally consider it to be. Its main reasons are as follows:

1. Personal difference are more in attitudes, which is why they cannot be measured realistically. Not only this, difference in intensity is also seen in attitude in each person. Some people may hate dowry, but intensity of this hatred may be different in each person.
2. In this relation second difficulty is that attitudes are abstract and measuring abstract is very difficult. What a person is thinking or experiencing, it can only be guessed and relying much on a guess in not considered appropriate.
3. Attitudes are very complex. The reason for it is that people's attitude towards any person or problem is affected and changes by many causes. Measuring attitude by averting all these causes or changes is difficult. At maximum, we may say that other conditions remaining same, possibility of a particular attitude is found in a specified person.
4. One more difficulty in measurement of attitudes is lack of any correct and acceptable to all scale. In material science, such instruments or scales are used much. Like heat can be measured in degrees through a thermometer. Weight of air may be expressed in inches through a barometer, power of an n electric meter in horse-power types of threads may be expressed in numbers. But in relation to measuring of attitudes, lack of such perfect and all-acceptable scales is always experienced.

But it does not mean that attitudes cannot be measured. Patiently using the scientific methods, attitudes may be measured correctly. Now we will briefly describe those scales through which attitudes may be measured.

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## 5.7 Methods of Measuring Attitudes

For measuring attitudes some definite methods are used. In this relation it is important that those methods or scales are understood in brief. For measuring attitudes, which main methods are used, they are as follows:

## 5.8 Opinion Scale

For measuring opinions, these types of scales are used much with the help of which regarding attitudes is also known. In this method, one such scale is developed in which in an order such propositions or terms are there towards which a person has to express his acceptance or denial. In scale, attitude is started to be measured from some extreme situation and then gradually it is moved towards an opposite direction. In other words, in scale, a sequential quantitative expansion happens of any attitude from unemotional to emotional and from favourable to unfavourable. In this expansion, in the basis of person's opinion an average may be taken out and his attitude may be measured. For e.g. if we want to measure the attitude towards Harijans then scale will be prepared in the below mentioned form:

1. You hate Harijans
2. You are sad towards the Harijans.
3. You have somewhat fondness towards Harijans
4. You like Harijans
5. You want to develop intimate relations with Harijans.

The above given scale starts with a target of attitude, 'hatred' and end in its opposite condition of intimacy. But purpose of all these is same. That is effort is made to give such place to the person on the measuring scale which may be expressed in his opinion. From person to person, those reactions are tried to be known which is expressed by their opinions. Person's opinion is the reflection of his attitude—it is the directing principle of this method. Under this method, measuring unit or scale is made. In it below mentioned characters must essentially be present—1. Scale is made a reliable scale, i.e. there must be not much difference in measurement obtained in two similar conditions. 2. Scales must be validated, i.e. in scales such items must be there that throw light on the attitude of the person in a realistic or practical manner. 3. There should be mutual gap or difference in the steps of scale. 4. Items of scale must be scientifically related to attitudes of person. 5. Impact of attitude of judges should not fall upon the selection of indication of scales. 6. Such items must be selected that people having various types of attitude may be divided in various categories.

### Self Assessment

Fill in the blanks:

1. In this method each person has to express his _____.
2. In this expansion, on the basis of person's _____ an average may be taken out and his attitude may be measured.
3. Person is tried to be given such a place on _____ through which introduction of the condition of the attitude of person is obtained.

## 5.9 Thurstone Method of Scale

Thurstone and his companions in between year 1929 and 1931, had presented scales for studying attitudes of members of various groups in relation to war, church, capital punishment, descendents

Notes

rules etc. Principle of Thurstone method is that if a person accepts or denies a statement, then on its basis, he can be provided a definite place on the scale of attitude. Hence, problem is of selection of appropriate statements only on the basis of which a person's attitude may be expressed realistically. Hence, in the method of Thurstone, a list of statements related to an object, subject or a problem, is made from the articles published in newspapers, from the operations of Lok Sabha, Rajya Sabha or Vidhan Sabha or from the opinions of companions. In these statements, from complete acceptance to complete denial, all kind of statements must be incorporated. As per this method, at least a collection of 200-300 statements is necessary. After this these statements are edited, and those statement are removed from the list which are not related to the study subject. These statements must be easy, short, complete, definite and evident so that the person may easily accept or deny them. In collection and editing of statements, person must try to be saved from personal bias. After this, these statements must be arranged in a sequence from extreme favourable to extreme unfavourable. For this, by doing the copy of statements, one copy each of each statement is sent to the experts or judges so that from them each judge as per their decisions divide those statements in various ranks. Those statements that are most favourable, judges are asked to place them in 1st rank and those statements that are most unfavourable judges are asked to place them in 9th or 11th rank and in between both these ranks, other statements are placed from favourable to unfavourable. In this way all statements are placed in sequence in 9 or 11 ranks. After this, from these statements, each statement is kept in the scale at that place which is the average place given to it by the most judges, on the basis of public opinion statements are placed in the sequence of scale. Those opinions or statements are not included in scale regarding which there is enough difference of opinion among the judges. At the end, scale is developed in such a way, from the limited statements selected in an appropriate manner, that under the complete scale various statements have got different places and statements or ranks are spread from maximum to minimum or from most favourable to most unfavourable.

Some special precautions must be taken in developing this scale. Those statements that are kept in the scales, their language should be easy, clear and meaningful; each statement from it must be prima facie related to the person's opinions, faith or attitude relating to any subject. Such statements that are double meaning or ambiguous, should not be used. Number of experts or judges should also be sufficient. While investigating the statements, judges must remember that they do not give a wrong place to any statement by being affected by any personal faith or attitude.

*Task* Which are the methods of measuring attitudes? Describe briefly.

## 5.10 Likert Method of Scale

In year 1932, Likert developed a little different and easier scale than Thurstone and with the help of it tried to know the imperialism of various groups, internationality and attitude towards Negros. Likert scale is made in below mentioned way:

For developing the scale, many statements related to the object or subject are collected. After this those people whose attitude has to be studied each of them is told that he expresses his degree of attitude towards each statement from those statements in five different ranks, i.e. towards each specific statement, each person expresses his strong approval, approval, indecisiveness, disapproval, strong disapproval. These five ranks are provided in a sequence, numbers 5, 4,3,2,1. The statement that gets more numbers is considered to be an indicator of favourable attitude. Those statements are taken out and separated which have no interrelation with the complete score of the person.

This method will be further clarified from the description of below given point-scales.

## 5.11 Point Scales

Notes

In this kind of scales various types of words or situations are taken and a point is given to each. It is told to the respondent that from the words or statements from which in comparison to happiness, anger arises in his heart, he may place a cross sign before them. Like this each word which has not been crossed by the respondent is provided 1 point. Attitude of any person is known on the basis of his crossing or leaving (not crossing) the words. This scale may be explained through one or two examples.

*Example 1:* A few words are given below. Those words with which you feel happy, you may leave them and with those words from which you feel unhappy or angry, put a across before them. Each word that will not be crossed by you will be given 1 point.

1. Dance-music
2. Worship
3. Many children
4. Family planning
5. Inter-marriage
6. Inter-caste marriage
7. Spiritualism
8. Materialism

With the help of the above scale we can find out the attitude of a person regarding various subjects. For e.g. if a person has crossed dance and music and left out spiritualism then it will be understood that he is a righteous person.

*Example 2:* From the below mentioned statements, from which do you agree or disagree, place a cross sign before them. Those you will not cross, each of them will be given 1 point.

1. Living in a joint family.
2. Doing inter-caste marriage.
3. Widow-remarriage.
4. Marrying in own caste.
5. English education to children.
6. Not sending the girls to school-college.
7. Living in village.
8. Settling in cities for the progress of children.
9. Worshipping.
10. Keeping the hobby of going to cinema.
11. Giving birth to many children.
12. Accepting family planning.
13. Accepting the ladies of the family to become members of club etc.
14. Keeping a strict watch on the ladies of the family.

Notes

It will be known by a person crossing or not crossing at the appropriate place, that whether he is traditional or a supporter of thought-process of the new generation.

*Notes* Some intellectuals have drawn our attention towards a few demerits of this scale. From those, the first is that for developing such a scale, definite type of dichotomous words are needed which are not found easily, as a result of which development of scale sometimes becomes very difficult. Second point is that through scale, study of people keeping mixed attitude cannot be done.

## 5.12 Summary

- Scaling makes science so capable that they may correctly and credibly measure the phenomenon coming under their study subject.
- In types of scales mainly point scales, social distance scales, rating or intensity scales, ranking scales are included.
- Many sociologists have told the method of measuring attitude. Out of these, Thurstone and Likert methods are the main ones.

## 5.13 Keywords

1. **Scaling:** Scaling is the method of determining the characteristics of objects through words or points or other symbols. It is such a method through which objects or phenomenon are measured.
2. **Opinion Scale:** Person's opinion is the reflection of his attitude—it is the directing principle of this method. Under this method, measuring unit or scale is made.

## 5.14 Review Questions

1. Tell the utility of scaling.
2. Those scales that have been used in sociological studies, describe them.
3. Tell the method of Likert's scale.

## Answers: Self Assessment

1. Consent or denial 2. Opinions 3. Measuring scales.

## 5.15 Further Readings

*Books*

1. Sociological Research and Statistics-Ravindranath Mukherji.
2. Methodology of Social Research-Sanjeev Mahajan, Arjun Publishing House.

# Unit-6: Reliability and Validity

Notes

CONTENTS



## Objectives

After studying this unit students will be able to:

- The condition of reliability and validity in the study of social phenomena.
- About related problems.

## Introduction

There are some characteristics of social phenomena—like complexity of social phenomena, intangibility, qualitative, variation etc. Thus, it is easy for us to study or find relevant factors based on these similarities, but this thing cannot be not stated related to the mother-father, student or any social phenomena; because they are highly diversified.

## 6.1 Problems of Reliability and Validity

Many social phenomena are intangible because they are based on social relations, it is not easy to find the facts related to them because their inspection and testing is very difficult and due to this we experience difficulty to obtain its objectivity. Beside this, social phenomena are qualitative, so it is very difficult its describe on a quantitative basis, if not impossible. So in this mean qualitativeness of social phenomena it anti to the objectivity, and these arises a very serious problem in search of facts; in the same way the variability of social phenomena these arises as new problem in search of facts. Because of its feature of variability, any fact related to social phenomena cannot remain static for many days. The element of uncertainty is hidden in any form in it. Here we describe that difficulties which act as barriers in order to obtain the objectivity-

*Task* Highlight the problems of reliability and validity.

**Notes**

**1. Complete Detachment from Subject-matter not Possible —** The first problem in establishment of objectivity is that the researcher cannot consider himself completely detached form the subject matter because he is visibly or invisibly an essential part of the subject which he is studying. Integral here does not mean that he is a member of that society but integral in the sense that he is a human and is studying some or the other human phenomena. If that human phenomena is related to his own group or society than it will have a special place in his heart and if that subject is not related to his own society or group then also it is obvious to have some biasness regarding that. In both the conditions it is not possible to have complete detachment and detachment in any form is a big problem for establishment of objectivity. It is for this reason that in the study of social phenomena the researcher has his own hatred or likenesses, enmity or conflict, attachment or detachment, like or dislike and all these will somehow affect the nature, direction, target, analysis or facts of study, no matter the researcher is aware of this or not or he is doing this willingly or unwillingly. In any state complete detachment from subject matter is a problem in the establishment of objectivity.

**2. Influence of Emotional Tendencies —** The subject that the researcher is studying is a part of social life and is influenced by various emotional tendencies. For various social phenomena some similar emotional tendencies become popular in a society and the researcher becomes a victim of such emotional tendencies during his research. For example if we take the case of prostitution during the study of these social phenomena the researcher becomes the victim of these emotional tendencies that all prostitutes are of bad character. One common tendency is that they earn money by selling themselves and researcher cannot keep himself free from this tendency. In the same way while studying joint family system, untouchability, caste system etc. the researcher is affected by some emotional tendencies and it becomes difficult to establish objectivity.

**3. Particularistic Fallacy — A**ccording to W.I. Thomas there is one more problem in achievement of objectivity that is particularistic fallacy which means that during the study of any social phenomena most of the researchers commit a mistake of focusing on any particular reason and considering some particular aspect as most important. There result is based on insufficient or unrealistic facts. For example, "Bad company is the only reason behind child crime", cultural differences is the only reason for the invention of caste system", "due to the effect of western culture Indian culture has entirely lost its speciality" such type of numerous outcome are examples of particularistic fallacy and there base is insufficient or unrelated facts. In such a situation achievement of objectivity seem to be impossible.

**4. False Idols —** Francis Bacon has drawn our attention towards an error through an important phrase that mostly researchers do while researching. He has written that these idols are of different types, for example Idols of Cave which means those errors that the researchers commit for any phenomena or person because of his limited and unrelated thoughts; these thoughts are his own and therefore, nobody else knows about them. Like this are the idols of a court or waadpeeth. An idol of Forum the researcher commits the mistake of believing unnecessarily on certain words. Along with this there are also Idols of the market place. Which means focusing too much on traditions, systems, etc. and deriving results based on them? In the last according to Bacon there are also The Idols of the Tribe which means that the researcher commits the mistake of seeing any substance of phenomena from his own perspective; it become difficult for the researcher to derive result by coming out from his own viewpoint and limited knowledge about life. All these conditions create problems in establishment of objectivity.

**5. Confusions Regarding General Knowledge and Real Knowledge —** Clyde W. Hart has written that objectivity is related to real knowledge not general knowledge. When researcher considers general knowledge as real knowledge or tries to derived results based on general knowledge or tries to reach less closer to objectivity then as a scientist he commits extraordinary mistake. Sometimes based on general knowledge the hypothesis he once formulates, and to prove them true he views all the facts in that perspective and presents them likewise. The facts that do not match his general knowledge, he carefully leaves them. Clearly from such practices anything may be achieved but not objectivity. This does not mean that general knowledge is not practical; it only means that the tendency to not test the reality of general knowledge by real facts creates a problem in establishment of objectivity.

Notes

**6. Possibility of Prejudices and Counter Prejudices—** It is said that a researcher has to move on double edged sword in the sense that if he adopts the prejudices nature for his subject matter then he goes far away from neutrality; and if he tries to do counter prejudices then many opposing prejudices hinders his path and make achievement of neutrality impossible. For example, if a researcher in the form of a member of a joint family analysis the defects of the joint family system by remaining unbiased then also the study would be one sided because by doing so he himself fells in to the trap of counter prejudices and for his study and results it would be said that he has closed his eyes for the advantages of joint family system. In the same way if he analyses only the advantages then the disadvantages are left out. It becomes very difficult to establish neutrality by using balanced viewpoint for advantages and disadvantages. If a researcher says racism is good then he becomes a victim of counter prejudices and he is blamed for being prejudiced and if he says racism is bad then also he becomes a victim of counter prejudices and he is blamed for being prejudiced for accepting the advantages of racism. In this way prejudices and counter prejudices are both problematic in establishment of neutrality.

**7. Ethnocentrism—** One more noteworthy problem in the establishment of objectivity or neutrality is ethnocentrism. This means that a particular person has a soft corner for his own society and social phenomena and this weakness is expressed in the form that he considers the family system in his society, religion, literature, language, other social and cultural institutions, thoughts and principles as most superior compared to others. Being superior does not reflect reality but is symbolic of his own weakness and creates problem in establishment of objectivity because it is impossible for a researcher to remain detached from this. In the same way when he studies the social phenomena of any other society then it becomes difficult for him to do unbiased and neutral study because he considers other society and their phenomena as inferior to his own society and also he evaluates those phenomena on the basis of the standards of his own society. That is why it becomes impossible for a researcher to achieve neutrality. In reality the feeling of ethnocentrism is symbolic of the facts that it develops itself in a person for his social system, traditions, institutions, values and idols and, where there is attachment establishment of objectivity if difficult, detachment is the first condition for achievement of objectivity. Ethnocentrism is opposing to this condition that is why it is problematic in achievement of objectivity.

## Self Assessment

Fill in the blanks:

1. An error through an important phrase that mostly _____ do while researching.
2. The _____ commits the mistake of viewing any subject matter his own perspective.
3. _____ is related to real knowledge not general knowledge.

**8. Vested Interest of the Researcher Himself—** Sometimes it happens that the vested interest of the researcher himself becomes a problem in achievement of neutrality. This only happens when he sacrifices truth for his altar of selfishness. For any researcher who keeps his vested interest on top most priority, there is no meaning of achievement on neutrality. His self-interest makes him blind and he presents all the facts in such a manner that his vested interest is achieved or very less blow is given to his own interest.

*Notes* Charles Wood has written "the vested interest of the researcher is that scale that does not measures the objectivity, but measures the researcher himself and based on that measure evaluates the significance of the study."

**Notes**

In this way it is clear that the vested interest is the enemy of objectivity and the partner of blind study. And it is for this reason that when the researcher influenced by his self-interest sees that the outcomes of his result are coming contradictory or opposing to his own principles then he presents the results in a distorted or unreal manner to make them according to his own interest and compiles only those facts that would help in the fulfilment of his own self-interest. In both the situations, the achievement of neutrality seems like a dream.

**9. Interference by External Interests—** There also arises problem when there is interference by external interests. For example, If there is a research such that in which there is an indication of the reveal of the black deeds of big business houses such as Tata's and Birla's then in such a situation the concerned selfish researcher as Tata's and Birla's would try to hide the facts so that their wrong deeds are not revealed and also true facts are not revealed. Interference by external interests can also mean different. In the way a researcher for the protection of his own vested interests presents the real facts in a distorted manner, similarly the researcher may also hide the real facts in a condition when he feels that he may protect his own society or group or some shameful aspect of his society or group may remain hidden because he is also attached with his own society and group. For example, a researcher may not present the facts related to sexual immorality in his own society or group clearly and with readiness as compared to the same phenomenon in other society or group and will try to show how degrading is their morality. In this way external interests are also a hindrance to study objectively and neutrally the social phenomenon.

**10. Need of Immediate Decision—** The lack of objectivity can also be present in the situation when the research topic is such that in which immediate decision can be taken. The reason for this is also clear. In haste not only the research work but simple work also fail. In such a situation stress is laid upon to quickly take a decision not on the compilation of dependent facts or analysis of unbiased facts. In reality it is not possible to do compilation of sufficient, complete and concerned facts and because of the need of immediate decision a researcher is dependent upon the facts that are readily available. It is clear that in such a situation the achievement of objectivity is impossible because the social phenomenon are so complex that without coming sufficient time for the compilation of the complete and concerned facts and classifying them and their results must be derived only after sensible and rational thinking. There is no place for any hurry in social research. In reality to take a social decision it takes years of hard work but most of the social problems are of such nature that the need to take immediate decision is experienced and therefore sufficient time is not available for the research on the topic. Therefore it is difficult to achieve objectivity in reality.

**11. Bias and Prejudice—** According to Lundberg, "Bias and Prejudice are the factors that bring complexity in all sciences but their importance in physical sciences is very less compared to the social sciences. The main reason behind this is that the social phenomenon becomes the victim of some common emotional complexes and the study of physical sciences keeps itself aloof from these. It is for this reason that the perception of physical facts from the normal senses is uniform." From this statement it is clear that there is not much hindrance created by bias and prejudice because there is no emotional relation between them with the researcher and there is no hope of any advantage from their bias and prejudice. Also, the researcher is not fearful of the fact that if during the study any weakness of the physical phenomenon is revealed then his 'humanity' would be at stake. Therefore, for physical phenomenon he does not feel shy to call truth as truth and to also his thoughts, interests, values and attitudes are not hurt. And even if he is hurt and is attached with any physical phenomenon, then also he is not that serious that it becomes impossible for him to carry out his research free from any bias and prejudices. Keller has rightly written, "A person can count the various or very less feets of a housefly by not hurting himself and dictate the results." But it would be a difficult task for a person who greatly loves his joint family to conclude that a person's success is only possible after the destruction of the joint family system. It is because of this that in the field of social phenomenon there is the presence of bias and prejudice everywhere and this pulls the researcher apart from objectivity. We can be free from bias while studying plants and animals but when we study our own selves the same task becomes difficult for us because we fail to completely preserve thoughtful neutrality.

Notes

*Did You Know?* Any researcher who studies any social problems has some pre-conceptions regarding the favour or against of that, on the basis of his own principles he classifies them as good or bad, correct or incorrect and based on his own vested interest may even mould the facts.

In any such setting it becomes a victim of biasness or prejudice and the study loses its objectivity. But in physical sciences there are lesser possibilities or distorting the facts because there is no fear in presenting the facts in their real form and there is no hope for any selfish interest. Opposite to this in the study social phenomena there is fear of power, fear of race and fear of caste which makes it biases, and its selfish attitude forces it to bend towards special and false basis. He does not forget the fact that he is an integral element of whatever he is studying and he gets trapped in his own interest, idols, values, interest-disinterest which make him biased and prejudiced. Affected by these the researcher forgets the achievement of neutrality and tries to reveal is own errors.

## 6.2 Summary

- Many social phenomena are intangible because they are based on social relations, it is not easy to find the facts related to them because their inspection and testing is very difficult and due to this we experience difficulty to obtain its subjectivity.
- There are many problems in the achievement of objectivity such as influence of emotional tendencies, and particularistic fallacy between general knowledge and real knowledge.

## 6.3 Keywords

1. **Objectivity—** It views and tests the facts related to particular phenomena on a rational and evident basis rather than as biased.
2. **Ethnocentrism—** Another problem in the path of achievement of objectivity and neutrality.

## 6.4 Review Questions

1. Explain the importance of validity and reliability in the study of social phenomena.
2. Describe the problems in the achievement of objectivity.

## Answers: Self Assessment

1. Researchers 2. Researcher 3. Objectivity.

## 6.5 Further Readings

*Books*

1. Social Survey and Research—Vandana Vohra, Radha Pubilcation.
2. Classical Social Contemplation—Agarwal Gopal Kirshan, Bhatt Brothers.

Notes

# Unit-7: Limitations of Survey

CONTENTS



## Objectives

After studying this unit students will be able to:

- Understand the meaning of social survey.
- Know what are the limitations of the social survey and to give information on this.

## Introduction

Social survey can be viewed as a method of sociology study. By this technique not only social problems are studied but also an attempt is made to find solutions to various social problems. In this sense social survey is a scientific tool for studying social problems and finding their solution. Scientific in the sense that the study work should be done in a scientific manner and any result or outcome is based on real inspection and testing.

## Subject-Matter: Meaning and Definition of Social Survey

The literal meaning of survey is careful inspection and analysis of any substance of phenomena. If that inspection or testing is related to any social phenomena then in a broader sense it is termed as social survey. From this viewpoint social survey is that scientific method of inspection and testing which is used for the scientific study of any social group or any aspect or phenomena related to any social life. Social survey is related to any social state, situation or problem. According to dictionary of sociology, "The detailed compilation and analysis of the facts related to a particular group or some aspects such as health, education, entertainment is termed as survey." According to Webster dictionary, "The critical inspection done in order to gather real information is termed as social survey."

Notes

From the above description it is clear that social survey is a process of compilation and analysis of inter-dependent facts of any aspect, subject or problem related to any social life that is based on certain scientific principles and assumptions and is useful for finding out results.

## 7.1 Definitions of Social Survey

In relation to the definition of social survey there is difference in the view point of scholars. Some scholars have described social survey as (a). A study of the general social phenomena, while other scholars have (b). A study related to finding solution to pathological problems and social reform, while some other scholars have described social survey as (c). A scientific technique. Therefore, it would be suitable to analyse the definition of social survey based on above three aspects.

**(a) Social Survey as a Study of General Social Phenomena—** The scholars under the first category emphasize on this fact in their definition that Social Survey is a study of General Social Phenomena. In the words of Wells, "Normally social survey can be defined as the study of activities and social institutions related to any human group living in an area."

*Notes* According to Hsin Pao Yang, "social survey is usually an inspection of the design, activities and the state of living of the member of a particular group."

**(b) Social Survey as a Study of Pathological Problems and Social Reform—** The scholars under the second category emphasize on this fact that social survey is carried out with an objective of finding solutions for social problems and doing social reforms. In this sense the fulfilment of two objectives that is studying the society and its problems and doing social reforms by finding solutions to social problems is social survey. P.V. Young has clearly written that, "social survey (1). Is the formulation of any functional plan for social reform and (2).Is related to finding reforms for the immediate or popular pathological state of social importance that is bound in certain geographical boundaries and certain social outcomes; (3).These states may be measured and compared with any such condition that may be acceptable in an idol form." In this sense the study of pathological problems and formulation of functional plan for social reforms through scientific technique for a definite human group or society living in a particular area is social survey.

According to Burgess, "The survey of a society is the scientific study of the need and state of a society that is aimed with an objective of presenting formative projects for social development.

**(c) Social Survey as a Scientific Method—** Those scholars come under this grade that induces social survey in the form of scientific methods. For example, Morse says "Briefly: Social Survey is only a method to collect any special social condition or problem or arranged and scientific form of census for some defined purposes. "

We simply have the feeling of general definition of social survey by studying all definitions presented by the scholars of the following three grades. We can say that social survey is that scientific method through which reliable data related to any social phenomenon or corporate life of a particular geographical area can be collected so that study of actuality of phenomena, and result can be made and if that phenomenon is complainable then contribution towards social–reform could be made by making important programme toward its solution.

## 7.2 Types of Social Survey

Different-different scholars describe in their own way different types of social surveys on the basis of subject-matter, nature, time and purpose.For example, Wells describes two types of social survey-

**Notes**

(1) Publicity or Sensational survey—These types of surveys are done for the purpose to create awareness in people or for the publicity of any non-material thing. This type of survey is very profitable for making government schemes successful because the view of public and sentiments of public can be known through survey and according to that aspect of planning can be decided. (2) Fact-collecting survey—When the survey is done for the purpose of collecting only data related to any social-phenomenon or problem then it is called fact-collecting survey. This type of survey can be of two types, first is scientific and second, practical. In scientific survey data are collected for gaining only knowledge related to any phenomena or for the testing of principles. The purpose of practical surveys are to collect important data for the solution of any social problem.

Herbert Hyman stated the following types of Social Survey- (A) Descriptive Survey—The survey which is done for the purpose of presenting descriptive analysis of any social incident, social arrangement, social nature-pattern, habit-pattern or social process. (B) Explanatory Theoretical or Experimental Survey—Surveys used for describing the inherent work in any social incident or problem or predicting the principles or studying through experimental method comes under this category. These types of surveys themselves are of four types—First is called—Evaluative or Programmative Survey. The immediate purpose of these surveys is the necessary improvement in social incident or problem on the basis of knowledge of factors searched through study, the building of project for clean-up or change. Therefore, this type of survey is also called Programmative survey. Second type is called Diagnostic Survey in which solution of any problem is searched. In other words, the survey arranged for finding the reasons of problem for solving that problem is called Diagnostic Survey. Third type is called Prediction Survey in which the purpose of study is to predict in relation to the future activity of any social phenomenon. Fourth type is called Secondary Analysis Survey. Unless the surveyor takes benefit from the material of past surveys for collecting the data for throwing light on his subject or problem and searches new rules on the basis of them then that is called Secondary Analysis Survey.

## Self Assessment

Fill in the blanks:

1. Publicity research
2. This type of _____ is very fruitful to success the government schemes.
3. When survey is done only to collect data then it is called _____ survey.

Besides the following types of surveys, some other types of surveys are the following:

**1. Census Survey—** In this type of survey information is gained by making contact with some subject or related persons or all censuses. In other words, in this type of survey instead of studying by selecting some samples from whole census all is believed to be unit of study and conclusion is made by collecting information from them. Study of very small or limited community is done by this type of survey, but for large community's excessive money, time and workers are needed and to carry that load is only possible for government or any endowed organization. In India, after every ten years this type of survey is done by government which is called Census and in which important information is obtained about every family and person.

**2. Sample Survey—** This survey is much different form of census survey and it is in this sense that in this instead of studying each unit of census only those units are studied which can properly represent the whole census and so the result obtained by studying these samples is made applicable to the whole census. This type of survey is done during the study of modern complicated and massive communties since it is quite difficult to study all people or units of detailed field. Hence from the entire population only some percentage of units are chosen and only these are studied and results are derived from this sample of units.

Notes

**3. Regular and Ad-hoc Survey —** When any permanent department or institute regularly keeps survey on some subjects then it is called Regular Survey. For example, Regular Survey is done by Census department, Reserve Bank etc. of Indian Government related to Census, credit facility and property of banks. On the contrary when survey is done by temporary arrangement for any emergency need or for the fulfillment of aim then that is called Adhoc Survey.In this survey is done temporarily without any proper arrangement by appointing any study team socially to fulfill any aim. While making any scheme, many times such questions are raised in the middle, that it is not possible to give proper and final form to the scheme without gaining important information about them. In that situation Adhoc Survey proves to be useful.

**4. Final and Repetitive Survey —** If the subject of study is very less differentiating and much confined then final conclusions are made related to that by studying it only once. This type of survey is called Final Survey. But, mostly; since social circumstances, data and conditions are changeable it becomes necessary to perform surveys repetitively on one subject so that important improvement in results of previous surveys in reference to changed circumstances and conditions, changes or additions can be done. With this aim, the Repetitive Survey work on one subject, this survey is called Repetitive Survey. In this type of survey the basis of survey remains the same as it was for the survey done before it so that both can be compared.

**5. Qualitative and Quantitative Survey —** When survey is done related to any qualitative subject or incident like public, prejudice, customs, rite, mentality etc. then it is called Qualitative Survey. On the contrary, when the subject of survey is calculative then it is called Quantitative Survey.Expansion of education and level of knowledge, caste structure, financial level, and rates of marriage–divorce are such topics regarding which data can be collected and expressed numerically. Therefore, this type of survey is called Quantitative Survey.

**6. Public and Secret Survey —** Public survey is called that survey whose data cannot be hidden from the public and after performing complete survey-work publicly its result is published for public information. Surveys related to knowledge expansion, national saving schemes come under this category. On the contrary there may be some such type of subjects, to publish the data related to them, may not be favourable to the country and administration. Since privacy is adopted in such types of surveys therefore they are known as Secret Survey.

*Task* Which is called Regular and Adhoc survey?

## 7.3 Merits of Survey Methods

In social research methods are used. Survey method is one of them. As compared to other methods, survey method has its own qualities which we can present in the following way-

1. In survey method researcher comes directly in contact with his research-subject. This happens because under this, the surveyor has to directly collect data from conditions and persons related to his subject and for the fulfillment of aim he has to make close contact and hard-grained contact with them. The success of survey depends on how much researcher is successful in making close contact with conditions and persons related to his research-subject. In this sense we can not say that neither survey method is a philosophical method nor based on blank bookish or principle knowledge.

2. In survey method there is a less possibility of leaning towards a specific subject. The reason for this is that under this method the researcher tries to collect data and figures related to his subject in their original form so consequently its result will be more subjective instead of pratitik.

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3. Social survey makes possible study-work of such subjects of social incidents. These subjects cannot be studied at home. For example, after the partition of the country what are the changes in the life of refugees settled in different states of the country or what are the effects on the life-pattern of original people of that the particular region where they get settled, these cannot be studied principally at home without taking the help of social survey method.

4. Survey method is quite successful in attaining scientific position. Corresponding to the methods used in natural science such methods are now developing in survey method according to which a particular social phenomenon can be controlled as per requirement. Anyways the social surveyor tries to see its research-subject or phenomena in the same way as it is, so that the original form of phenomena remains the same and it is possible to exactly conclude about the phenomena.

5. Survey method is a reliable source of directly gaining knowledge. The reason for this is that in this there is direct contact of the surveyor with his subject. This direct contact does not make imaginative ideas come within study-areas or the possibility of such types of ideas gets less.

*Did You Know?* If we directly want to gain knowledge about the conditions of labours settled in labour colonies of industrial areas or about the pervaded poverty in landless agriculture-labours or about the real condition of Harijan children in educational institutes then social survey method is the best method.

## 7.4 Limitations of Survey Method

Besides the following merits of survey method it has some limitations which we can present as following:

1. Only those phenomena can be studied through survey method which is viewable. But most phenomena are not of this type that is they are abstract and emotional. Study of this type of abstract and emotional phenomena are possible through survey method.

*Did You Know?* It is not possible for surveyor in every situation to himself be present at every field of social incident and investigate the incidents and in that case the necessity of social survey itself gets decreased.

2. Social survey is more expensive and time-consuming. A lot of time and money is needed in social survey. Lot of money gets spent in the arrangement of shelter of workers appointed for survey work, salary, training and inspection along with questionnaire, schedule, interview, graphical display etc. and therefore most of the survey work gets stopped in the middle due to the deficiency of money. In the same way it takes many-many years for brief surveys. And during this long period it is difficult to maintain the same energy and patience.

3. In the process of survey, there is a pre-planned way of search because of which sometimes the whole survey work moves mechanically and the independent field of the use of his own mind for surveyor remains very narrow.

4. The conclusions obtained through survey is suspected because during survey it is very difficult for surveyor to keep himself apart from personal likings and dislikings, partiality, rite and pre-belief. The

**Notes**

success of survey depends upon loyalty, skill of surveyor, subjectivity of data, support of informers and the use of survey techniques. But the attainment of all these together is very difficult.

5. Social phenomena are quite abstract and scattered. Therefore, it is very difficult to tie them in same formula. This is the reason that surveys are themselves as incoherent and scattered. To weave them in one link and construct one principle itself becomes one problem. Today social scientists are more aware towards the solution of this problem and the path of success of social science is expected on the success of them.

## 7.5 Summary

- The scientific process of collection, description, conclusion of data related to the complete life of a community or to its specific part is called as Social Survey.
- The success of survey depends on the fact that how much surveyor is successful in creating direct contact with related conditions and persons of his study subject.

## 7.6 Keywords

1. **Qualitative Survey—**When the survey is done related to any qualitative phenomenon or subject like public, prejudice, customs, rite, mentality etc. then it is called Qualitative Survey.
2. **Quantitative Survey—**When the subject of survey is calculative then it is called Quantitative Survey like expansion of education and level of knowledge, caste structure, financial level, Rates of marriage-divorce etc.

## 7.7 Review Questions

1. Tell the merits of social survey.
2. Discuss the meaning and limitations of social survey.

## Answers: Self Assessment

1. Awareness 2. Survey 3. Data-collection-survey.

## 7.8 Further Readings

*Books*

1. Sociological Research and Statistics-Ravindranath Mukharji.
2. Fundamentals of Sociology-Dr. Ganesh Pandey, Arun Pandey, Radha Publications.

Notes

# Unit-8: Techniques and Methods of Qualitative Research

CONTENTS



## Objectives

After studying this unit students will be able to:

- Gather quantitative facts related to social activity
- Construct a sub-imagination
- Acquire material and arrange it in a serial manner
- Decide the problem so that the researcher can focus his study on one point.

## Introduction

August Compt has definite view that there is no place of gambling or speculation in scientific study. In other words, the results obtained from spiritual or philosophical thinking can be true as well as imaginative, hence the results to be true or imaginary is just a matter of chance whereas scientific study cannot be and should not be dependent upon 'chance' or 'speculation'. Therefore, every science adopts one or several definite and organized study-techniques for its experimentally proved study work. This is known as techniques and these techniques serve as base for scientific research. Basically, these techniques are similar for all forms of science; only necessary changes are made in their form depending upon the study object in each science. Thus, we can say that technique is that method using which we decide the structure of the study-work; do critical analysis of the data and the results.

## 8.1 Study Methods of Sociology

As far as study techniques of sociology are concerned, it is said that the sociology techniques are not much proven but their quantity is plenty. Probably, that is the reason that French mathematician had once said that sociology is the science of maximum techniques but least results. The above statement of Poincare was a big claim. Botomore has written, " The truth in Poincare's statement is that there has been a lot of dispute regarding the correct techniques of sociology and every sociology philosopher's inclination has been to expand the new techniques towards a particular subject." By writing this, Botomore means to say that the study of society is much tougher unlike the study of nature.

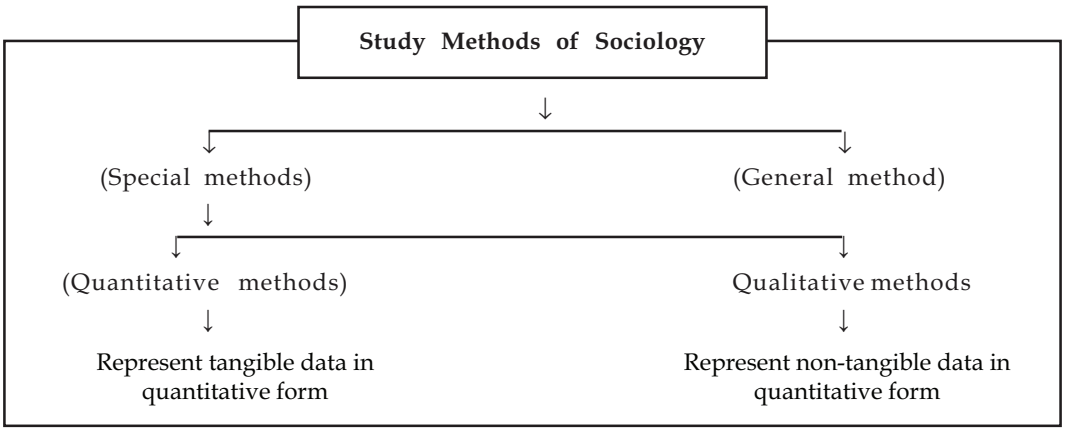
Notes

*Notes* Apart from Dilthe, German historians have also hinted towards this. Really, sociology techniques are different from techniques in natural sciences on the basis of study-topics, nature, etc.

**(A) Quantitative Methods—** These techniques represent the concrete facts in a quantitative form.

**1. Social Survey Method—** This method was first used by Leplay.

**Meaning—** Mark Abrams says, "Social survey method is a process by which quantitative data related to social organization and social activities are collected.




**Work Flow—** In this method, work has to be done at several levels. First, the subject has to be decided. Then before compiling the data in the region, the equipments and the resources should be known. After the resources for material collection and compilation are determined, then the collection of material begins. Material collection is organized using interviews, questionnaires,, schedule, etc. At fourth level, the critical analysis of the material has to be done. Classification, serialisation, analysis are used to find out the results of survey. The last step is to prepare the report of the survey. In the report, facts and data are represented using graphs and plots as well.

**Type—** (1) Ordinary Social Survey is wherein a study of problem of a particular cast/category is done in a collective form whereas.

(2) Special Social Survey is study of a special social problem.

**Importance—** Since the social survey method is based on practical knowledge, it is possible to have direct knowledge about the region. Due to this reason, the importance of this methos is increasing.

**Limitations—** This method has its own limitations as well. Study of emotional and intangible facts is not possible. There is always a possibility of impartiality and several times because of lack of correct sampling the results are wrong. Despite these limitations, the popularity is continuously increasing which shows the importance of this method.

**2. Statistical Method—** According to Kendal, " Statistics is that branch of scientific methods which is related to the information obtained from measurement or computation of qualities of different elements in a group." This makes it clear that social statistical method is a method to statistically study the data in a scientific form. Therefore, Odum has regarded statistics as a necessary part of research.

**Workflow—** In the first stage of statistical method, the samples have to be chosen. In the second step, compilation of records should be done. In the third stage, classification and serialisation is done. In

**Notes**

the last stage, using different averages, the frequencies are made simpler and then represented using graphs and charts.

**Importance—** Quantitative method is very helpful in sociological study, especially in cases where measurements values are abundant. For example, population of a category, rate of crime, export from country, etc questions are related to measurement. Therefore, they are solved using measurement. Prof. Giddings was the first sociologist who attracted the attention of scholars towards the importance of computation in this field.

**Limitations—** In this method, we make records and lists. But this does not convey complete information about the internal reasons. In order to complete this gap, we require the use of qualitative methods.

3. **Historical Method—** Bottomore has written clarifying the historical method, **"In this method, there is a combination of a special sequence of preferences of the problems for the research and philosophy. It focuses attention on the birth, development and enactment related problems of social organizations, societies, etc. It is affiliated to the complete stretch of human-history and the predominant organizations of the society, the example of which is the works of Compete, Spencer and Hobhouse."** Thus, this method recommends using human history to study the social events and social organizations.

Later, the developmental perspective was included in the historical method and the complete development cycle of any social organization was explained on an evidence basis using history. Westermark's creation 'History of Human Marriage' and Openheimer's work 'The State' are based on this development sequence in the historical method. According to Bottomore, "The modern awareness towards the problem of social development is nearly completely focussed on industrialization and economic development."

In this situation, it is natural that there will be some development of narrowness and rigidity in the developmental plans. The truth is that the rise of resulted-oriented economy and the geographical definition of history by Karl Marx are examples of these narrow developmental principles.

*Task* Express your views about historical method.

4. **Comparative Method—** According to Bottomore, **"Comparative method was considered the best method in sociology for a long time. Firstly it was used by developmental sociologists but its use does not necessitate affiliation with historical method."** Durkheim in his work 'The Rules of Sociological Method' has also tried first to establish the importance of comparative method.

Using the comparative method, one can find the general reasons for growth start and end of different organizations and beliefs of different societies. Thus, we can know the general motivating factors functional in human-society which are responsible for unity among different organizations or different organs of a society. In reality, while using comparative method, one should compile the data related to society and weigh them against real examination-test and thus should detach oneself from emotional, philosophical, etc. views so that the comparative work and the laws are free from any bias.

**To follow the comparative method, there can be primarily two types of problems**- (1) Lack of scientific imagination and (2) Problem of definition of unit of comparison. For example, written by Compte 'Law of Three Stages' is based upon the view of the development of mankind rather than scientific imagination

5. **Structural Functional Method—** This method was developed to eliminate the ambiguity and non-reliability of historical and comparative methods. This method was extensively used by Malinowski, Radcliffe Brown, Durkheim, Merton, etc.

**Notes**

Structural functional method follows certain set guidelines. These guidelines are essential for the scientific analysis of a social event. These guidelines are-

*(i)* A social organization is comprised of several units.

*(ii)* Every social unit does some function i.e none of the functional units are idle.

*(iii)* These different units are related and dependent upon each other due to their functions.

*(iv)* Due to functional relationships, these social units are tied mutually into a bond and therefore function accordingly while being related.

*(v)* Since different functional units work while being in a relationship, the social organization or structure grows and develops.

*(vi)* Thus the human requirements are met in accordance with the cultural values since the work and situations of different units are regulated and affected by the cultural structure.

*(vii)* The stability and continuity of the society is dependent upon the different units.

In this way, the main objective of functional method is to find out the functional relations among different functional units, do their analysis and represent them after properly understanding the social organization. Probably, this is the reason that the method is also known as structural and functional method.

**(B) Qualitative Methods—** These methods represent the intangible data based on qualitative terms.

**1. Inductive and Deductive Method—** There is immense contribution of earlier sociologists in promoting the use of these methods in sociology. The truth is that these methods were used considering the difficult and dynamic behaviour of social events. The description of these methods is as follows-

*(i)* **Inductive Method—** In this method, based on some special data, the general rules are determined. In this way, inductive method is that method which considers certain special events of the society to frame general rules. This can be easily explained using the following example- Suppose , we observe in our everyday life that Sohan, who is a human being, lives in a group and satisfies his requirements with the help of others; Matru is also a human being and satisfies his requirements with the help of others while being in a group. The same way Harish also satisfies his requirements. From these special events, we frame a general rule that human being is a social creature who satisfies his requirements with the help of others. Thus, this is induction and inductive method.

## Self Assessment

Fill in the blanks:

1. Using _____ one can find the general reasons for growth start and end of different organizations and beliefs of different societies.
2. While using comparative method, one should compile the data related to society in _____ way and weigh them against real examination-test.
3. In these kind of research oneself should keep distance from emotional, philosophical, excited etc _____ views so that the comparative work and the laws are free from any bias.

## Merits or Advantages

1. This method can be used to evaluate the truth-level of past rules.
2. This method yields more reliable and real results.

**Notes**

3. This method is sufficiently helpful to deductive method.
4. This method is based on psychological order.

## Demerits

1. Incomplete data can produce false results.
2. This method cannot be used to formulate static rules.
3. This method becomes useless in those fields of sociology wherein it is difficult to find data.

*(i)* **Deductive Method—** In this method, special results are obtained using general rules. In more easy terms, it can be said that achieving special results on the basis of some general data is known as deductive method. It can be easily explained using an example—it is a general rule that—"Human being is a social creature which fulfils its requirement with the support of others." On the basis of this general rule, a few special results can be obtained, like—Sohan, Matru, Harish, Mohan, etc. are all social creatures hence each of them individually will fulfils its requirements using the support of others. Thus, this is a deductive method. This method is also addressed as imaginary, analytical, intangible methods.

## Merits or Advantages

1. The obtained results are adequately reliable.
2. It is a simple and less expensive method.
3. This method can formulate all worldwide rules.
4. This method helps inductive method to make it a complete method.

## Demerits

1. This method is incomplete without the inductive method.
2. In case of incomplete data, the results from this method cannot be reliable.
3. If the quantity of data obtained is not much, then also the results obtained from this method may not be reliable.
4. This method is imaginary and intangible.

**2. Case Study Method—** This method was first used by Lepley and Herbert Spencer. Case study method is considered the best method for qualitative study.

**Meaning—** This is a method wherein the social unit (individual, organization, category) is viewed in totality.

**Work-Flow and Important Facts—** In this method, a personal relationship is established with the person. All the facts of a person's life can only be known easily only if we know the person very well. While talking, the interviewer takes a brief note. Apart from interview, biographies, letters of good friends, personal articles, etc can also be helpful. While using this method, the following should be kept in mind-

1. The study of a person should be carried out in his social background.
2. The importance of family and other preferential groups in a ones life should not be forgotten.

Notes

3. Stress should be to find out such data by which the entire life of the person can be described.
4. All the life events of a person should be described in the original form.
5. People should be chosen only from the related geographical region.
6. A trained personnel should only be made in-charge of this activity.

**Importance—** This is the only method to understand the personal problems in a detailed manner. The social thoughts and values of a person can be understood only using this method.

**Limitations—** It is requires more time and money Re-examination of data is also not possible.Since the study is not based upon sampling process, several other difficulties also arise. There is also a possibility of partiality.Whatever it may be, the case study method is gaining popularity for the study of sociology.

**3. Sociometry—** Moreno was the first sociologist who diverted the attention of scholar towards this method in this field. Jenings said, "In general sense, this method is meant for representing the mutual relationships among the members of a group on a special occasion".

Calculative method helps us to do calculation, the outer facts are made clearer. For example, by calculation, it can be made clear that how many people in the country are unemployed, but why are they unemployed cannot be answered. To know this internal fact, we have to depend on sociometry. In this perspective, Moreno formulated certain scales and certain norms using which not only can we describe the internal processes of our society, but also we can measure them.

## 8.2 General Methods/Scientific Methods of Sociology

Sociology has also accepted methods recognized by other sciences. They are known as General Methods or Scientific Methods of sociology. The following are the main steps of this method-

1. **Formulation of Problem—** The topic which we will be discussing will be known as the main problem. For example, child crime, unemployment, marriages, etc.

*Did You Know?* It is necessary to fix the main problem so that the researcher can focus his study at one point and does not let it spread elsewhere. By deciding the problem, a certainty can be achieved in the study-work.

2. **Formulation of Hypothesis—** After classification, the rule that is resident in the basis is extracted out because the validation of the rule is still pending, hence it is still not considered a rule yet.
3. **Observation-** Observation can be of two types-
   *(i)* **Participant—** In which one has to become a member of the group to examine.
   *(ii)* **Non-Participant—** In which the examination is done as an outside member of the group.
4. **Collection of Data—** Observed data are noted. It is necessary to store the data because it is not possible to remember the data using one's own memory.
5. **Classification of Data—** After collection of the complete data, it is arranged in a definite order. This ordering of data is known as classification. The result of classification is that several hundred facts can be divided into five or seven groups.

Notes

6. **Verification—** In this case, the verification is not done on the events but the emerged rule is subject to verification under the guidelines of widely spread principles. After this verification, whichever rule is working properly under the hypothesis is formally declared a rule.

## 8.3 Summary

- There are two types of methods for research in Sociology- Quantitative Methods and Qualitative Method.
- Quantitative methods represent tangible data in quantitative form while qualitative methods represent intangible data in qualitative form.
- Inductive and deductive method, case study method and sociometry method are classified under qualitative methods.

## 8.4 Keywords

1. **Sociometry—** Sociometry is the method of measuring the significance and position of individuals in a group, the group-organization and the inter-relationships in a small group.
2. **Structural Functional Method—** This method of sociological study, known as structural functional method was developed to eliminate the ambiguity and doubts found in historical and comparative methods.

## 8.5 Review Questions

1. How many types of research methods are present in sociology?
2. Explain the meaning of inductive method.
3. Describe the merits and demerits of inductive method.
4. What is the meaning of deductive method?
5. What is the case study method?

### Answers: Self Assessment

1. Comparative method 2. Collected 3. Thoughts.

## 8.6 Further Readings

*Books*

1. Classical Social Contemplation-Agarwal Gopal Krishan, Bhatt Brothers.
2. Social Survey and Research-Vandana Vohra, Radha Publication.

# Unit-9: Observation Method

Notes

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## Objectives

After studying this unit students will be able to:

- Understand the meaning of observation
- Understand the types of observation
- Know the meaning of participant observation.

## Introduction

Observation method is a very old and popular method of research. Maximum part of the accumulated knowledge of human beings is the result of observation. Human beings have taken the support of observation for the common knowledge till the knowledge of the secretes of nature. Observation has played an important role in the initial development of various sciences. Due to the contribution of observation in the search of knowledge since the old times, Mojer has called it the scientific methodology of scientific research.

## 9.1 Observation

The word observation means to "see", "to observe", "to inspect" or "to evaluate". In other words, observation is minutely studying the naturally happening incidences to know the cause-effect or interpersonal relations.

Notes

Oxford concise dictionary has defined observation as "actual inspection and description of the incidences in relation to the cause-effect or mutual relationship, in the form they are present".

As per P.V. Young, "observation may be used as a thoughtful method of study of collective behaviour and complex social institutions through eyes, along with, single units that create completeness". Young has written an alibi "observation is a deliberate study of spontaneously developing incidences at the time of their happening, arranged by one's own eyes."

As per Prof C.A. Mojer, "in exact meaning, in observation as compared to ears and voice, use of eyes have more freedom".

*Notes* Observation is a direct and important methodology of compiling primary data. In this, researcher sees the incidences, hears, understands and compiles the related data. For observation, observer may participate in the daily life of the collective or community or may do this by sitting at a distance. In observation, man makes use of his senses.

## Characteristics of Observation

Based on the various definitions of observation, evident characteristics of observation are mentioned below:

1. **Use of Human Senses:** In observation, completed and organized use of human sense is made. In this, observer also uses his ears and voice, but eyes are used in it in the most important way. He investigates the incidences through eyes and notes them for compilation.
2. **Collection of Primary Data:** In this method, observer himself is present at the point of incidence and collects first-hand information about the incidence; hence they are more trust-worthy.
3. **Minute, Deep and Purposive Study:** In observation method, observer himself is present at the point of incidence; hence, he can make a minute and deep study of the incidence and compiles only those facts which are related to his study.
4. **To Find Out Cause-effect Relationship:** The basic difference between general observation and scientific observation is that in general observation, observer only sees the incidences, whereas in scientific observation, after seeing the incidences, he finds out their cause and effects, based on which it is possible to move ahead with principle formulation and to find the truth.
5. **Practical and Empirical Study:** Mojer's thought is that observation is an experimental and experience-based study method, through which both type of behaviours, collective and important, can be studied. Study done through observation is not imaginary but is dependent on practical or experience.
6. **Impartiality:** In observation, observer himself sees the incidences from his eyes and investigates them properly, tests them on the scientific criterion. Hence, its inference in impartial and scientific and is saved of bias.
7. **Direct Study:** In observation method, observer directly sees the incidence, contacts the people related to it and compiles the facts.

Notes

8. **Study of the Collective Behaviour**: Just as to study individual behaviour, case study method is considered the best, in the same way, to study collective behaviour, observation method is considered to be excellent.
9. **Deliberate Study:** Johada's thought is that observation is a method in which observer himself, deliberately studies the incidences and compiles the facts. He does not depend upon the spoken and heard words of others.

Because of these attributes of observation, it is considered to be an important methodology of trustworthy and scientific methods.

## Utility (Merits) of Observation Method

Uses, importance or merits of observation method may be expressed by us under various methods, in the following manner---

1. **Easy and Primary Technique:** In various methods of social research, observation method is easiest because like other methods, in this method, observer need not have special knowledge or training. Since the ancient times, human beings have been using observation naturally; hence it is also a primary method.
2. **Accuracy and Reliability:** Since in observation method, observer, instead of depending on others, observes the incidences from his own eyes, hence this method is more accurate and reliable as compared to other methods.
3. **Helpful in Formulation of Hypothesis:** In observation method, person gets an opportunity to see, hear and understand many incidences, which increase his experience and provides him an insight as a result of which observer develops an ability to formulate various hypothesis.
4. **Most Popular Technique:** Among various methods of social research, most famous and popular method is observation which is prevalent since the ancient times. Hence, it is a polite method.
5. **Possibility of Verification:** In observation method, accuracy of the facts compiled can be verified easily. Observer sees the same incidence happening again and again, which is not possible in other methods.
6. **Possibility of Continuous Use:** Observation can be used continuously. We can increase our knowledge by observing the incidences around us and prepare the base for hypothesis.

## Demerits or Limitations of Observation Method

Where observation method has many uses, it has many demerits too which set its limits. They are as following:

1. **Limitations of Senses**: Job of observation is done with senses, especially eyes, the power of which is not perfect. They many a times work differently, indefinitely and in a biased form. Our eyes and ears are easily attracted towards certain special incidences. In such a situation, our study may be faulty.
2. **Artificiality in Behaviour**: When people get to know that their behaviour is being observed, they bring artificiality in their behaviour and naturalness gets destroyed, hence study becomes faulty.
3. **Possibility of Bias**: In observation, interpretation of the observed incidences depends on the observer. During interpretation, his thoughts, values, principles, and culture also have an effect; hence the inference of the study may be faulty.

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4. **Inadequate in Some Studies**: There are many such incidences like crime, history of personal lives, etc. which do not give an opportunity for observation. P. V. Young has written "not all incidences can be observed. Observer is not present at the time of happening of all incidences and nor is it possible to study all incidences through various observation methods."

Three inferences can be drawn from this statement of P.V. Young:

*(i)* There are certain incidences, observation of which is forbidden, such as the personal life of two lovers.

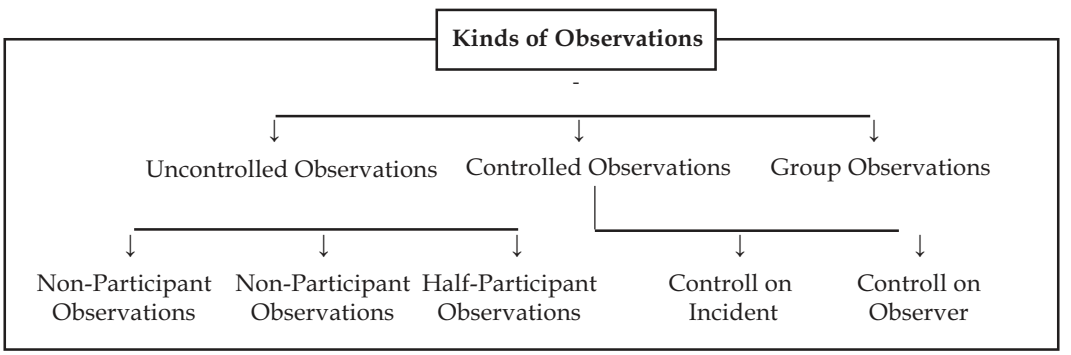
*(ii)* Certain incidences are such that their place and time of happening is not fixed; hence their observation is not possible.

*(iii)* Nature of certain incidences is such that their observation is not possible, such as—a person's thoughts, feeling, objectives, nature or incidences happened in past etc.

Despite of the certain limitations of observation method, it is being used in the social research since the ancient times. Its importance as a method that provides the comforts of being easy, trustworthy, and useful and verification will always be there. With time, there have been improvements in it and day-by-day it is becoming a more standard and trustworthy method.

## Kinds (Types) of Observation

Social incidences are various and complex in nature. Study of all the kind of incidences cannot be done through the same kind of observation. Because of this only various kind of observations have been developed. Originally, observation has been divided in controlled or uncontrolled and participant and non-participant category. We can express various types of observation through a chart in the below mentioned manner:




We shall mention here all the above named types of observation:

## Uncontrolled Observation

We can study social incidences through both types of observation, controlled and uncontrolled. In uncontrolled observation, there is no form of any control on both, the observers and the group being observed. Observer studies the incidences in their actual and natural form only. In uncontrolled observation, any kind of special framework, formality or appointment is not there. Because of it being a simple job, Godey and Haute calls it simple observation. Jahoda and Cook call it unstructured observation. Uncontrolled observation is also known by the name of open observation, informal observation or indirect observation.

In the field of social research, uncontrolled observation is an old method. Expressing this fact, Godey and Haute have written "in the subject of social relation, whatever knowledge humans have,

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maximum part of it has been acquired through uncontrolled observation, whether it is participant or non-participant". With this statement, importance and usefulness of uncontrolled observation is expressed itself.

Understanding the meaning of uncontrolled observation, P.V. Young has written "in uncontrolled observation, we carefully investigate circumstances related to actual life , in which there is no effort made towards the use of incidences of accuracy and investigation of the purity of observed incidence "this definition of Young highlights three specialities of uncontrolled observation: (i) in this method there is no control on the observer (ii) in this observer studies the incidences and circumstances in their natural form (iii) observer does not test the incidences, hence, it is a very easy methodology. Based on its nature, uncontrolled observation has been divided into participant, non-participant and semi-participant categories. Here we will discuss all the three sub-parts.

## 1. Participant Observation

In year 1924, Lindeman in his book "social Discovery", had first used the word participant observation. He attracted the attention of the people towards the disadvantages of studies done through schedules and questionnaires and usefulness of participant observation. Lindeman has written about participant observation, "Participant observation is based on the principle that interpretation of any incidence can be almost clear only if it is made by joining both the external and internal points of view. In this manner, that person's point of view, who had participated in the incidence and whose desires and self-interest vested in it in some or the other manner, will be practical and different from a person's point of who , instead of being a participant is, merely a viewer or an investigator".

*Task* What do you understand from participant observation? Explain.

## Meaning and Definition of Participant Observation

For participant observation, observer goes and lives in that group or community, whose social incidences he wants to study. He participates in people's daily and all other activities and also investigates them. In this the group's people accept the observer and start considering him to be their member. In this manner, observer temporarily becomes an internal person of the group.

Defining participant observation, Godey and Haute has written "this practice is used at such a time when the observer hides himself in such a manner that he is accepted as a member of the group."

As per P.V. Young, "participant observer using uncontrolled observation, generally lives and participates in the group he is studying."

As per Lundeberg, "observer establishes possible complete intimate relation with that group, meaning that he settles in the group and participates in their daily activities."

Forcase and Richer have written, "Through participant observation, researcher becomes a member of the group being studied. The primary belief behind doing this is that he is able to know the properties of the group closely, which is not possible by staying out of the group. "

John Mej has written "when observer's heart beats mingle with the heart beats of the other people of the group and he no longer remains a stranger who has come from outside, then it should be understood that he has acquired the right to be called a participant observer".

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As per P. H. Maan, "Participant observation means a situation in which the observer also participates in all the normal activities of the group being studied."

It is clear from the above-mentioned definitions that **in participant observation observer lives in the group being studied and compiles the facts becoming a part of it.**

Many social scientists have used participant observation in their studies. John Howard has studied prisoners, Lipley and Booth have studied labour families, Malinowski has studied Trobri and Island's Agronaut tribe, Raymond Firth has studied Tikopia people, Nels Anderson has studied Hobo people and White has studied the people who spend their lives on road through participant observation only. Through this method, usually communities, primitive tribes and their cultures are studied. It is considered to be an appropriate method to study any communities' customs, festivals, beliefs, folk songs, religious activities and behaviour.

In this reference, the question arises that to what extent should the observer be mixed with the group being studied, in which activities should he participate and in which he should not? Should he tell his identity and purpose to the people of the group? What should be the place of the observer in the group?

In answer to these, differences in the views have been found. American sociologists view is that observer should study the group without telling his identity and purpose. He should work with such cunningness and alertness that the people of the group consider him to be their own person. By only doing this he will be able to actually study the group.

On the other hand, views of Indian sociologists are different from this. They say that in a country like India observer should make his identity and purpose clear to the people of the group so that people do not look at him with suspicion and may provide their support in compilation of facts. By doing this observer receives the trust of the people of the group and they provide him a proper place in the group. India is a country where maximum people are illiterate, participating in social life of the people without disclosing his identity and purpose will only create suspicion towards the observer, and then they may bring a change in their actual behaviour. From ethical point of view also it is right that the observer **does not say lies to the people of the group.**

Shri B. D. Paal has mentioned those activities in which participant observer may participate such as helping in ploughing the farms, helping in making the house, hunting with gun and providing food to the tribes that hunt with bow and arrow, taking them in his car and talking to them, distributing pictures and photos among them, distributing food and money on festivals, playing musical instruments, inviting people at his home for chit chatting, distributing sweets and toys among the children etc.

For a successful participant observer it is necessary that he has complete knowledge of the language, customs, behaviour, practice, tradition of his study group. When he speaks to the people of the group in their language they consider him to be their own and normally do not hide anything. Participant observer should also be witty and diplomatic. To what extent a researcher can be a participant also depends on the size of the group. In a family complete participation is easy but in a city it is possible only to a limited extent. Other than this amount of participation also depends on the subject of research and competence of the observer. Participant observer should not make such close relations with the group that he develops a feeling of partiality towards the group.

## 2. Non-participant Observation

When an observer, without participating in the life of any group, stays away from the activities of the group, and studies them with a neutral eye like a scientist, then it is called non- participant observation. In this method observer does not go and stay in for a long time in the group or community, nor does he participate in their activities. He is a stranger and a silent onlooker. In such a study there is more possibility of freedom and impartiality. Without informing people, he receives information by being

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present at the time of the happening of the events. Whatever he sees, he attains in-depth information about it. But complete non-participant study is also not possible. He will have to stay with people for some actions and activities. Godey and Haute have written, "As the students understand, "pure non-participant observation is difficult". Non-participant observation is used more for experimental observation. Like study of the moments of the work and holiday of the labours and school students of any factory may be done through this method. For psychological studies also, observer sits at a distance and studies various activities of the children. In this method only external characteristics of the group are studied, minute and deep knowledge of internal relations is not possible through it. Non-participant observer can sit at a distance and watch the dramas staged in villages, he may quietly sit and tape the folk songs or listen to them.

## 3. Quasi-participant Observation

In any study, complete participant or complete non- participant observation is not possible, because of this only, Godey and Haute have suggested to accept the mid-way of the two, which is called quasi participant observation. In this kind of observation, observer participates in some simple activities of the group being studied. However, mostly he observes them without participating, with a neutral feeling.

## Merits (Advantages) of Uncontrolled Observation

Nature of social incidences is such that their controlled observation is not always possible, hence they need to be observed in natural circumstances only. P. V. Young has written appropriately, "Such circumstances of life which can be studied under controlled and artificial circumstances are comparatively very few. Usually we need to observe when it is possible and observation need to be done in those actual social and cultural circumstances in which the incidence has happened."Possibly because of this only, development of social principles and knowledge about the daily life is the result of uncontrolled observation. Uncontrolled observation is the best method of the study of complete life of any community. Describing its usefulness in investigation of premise **Godey** and **Haute** has written "it is said to be important to accomplish uncontrolled observation at the initial stage of any research project because through it regional investigation of minute premise can be done". **P.V. Young** has written, "Carefully done observation has accuracy and capability to see the incidences properly is incorporated in it". Expressing its usefulness, **Mojer** has written "because facts compiled like this are saved of position and memories and they do not lack the credibility like the questions and answers, they are more accurate and correct". Through uncontrolled observation, (i) incidences can practically be seen at their actual point of happening (ii) in it observer does not influence the study (iii)in it, neutrality, creditability and objectivity is maintained (iv) through this method study of variable and dynamic social life is possible.

## Demerits (Limitations) of Uncontrolled Observation

Describing the limitations of uncontrolled observation Prof. Banarad has written, "Data are so real and life-like and our feelings about them are so strong that sometimes we make the mistake of considering our imagination to be an extension of our knowledge". Its main limitations are as follows: (i) in it there is possibility of mistake because of no control on the observer. (ii) in it there is possibility of compilation of such facts which are not related to the study (iii) since the facts are written after the observation, there is a possibility of mistakes in writing and also a possibility of missing out the facts (iii) in this the observer develops a misunderstanding that he knows everything about the group, whereas actually it is not so.

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## 9.2 Controlled Observations

Along with development of social sciences, social research has also undergone changes. As a result of this to overcome the demerit of uncontrolled observation, controlled observation was developed. In controlled observation, observer keeps a control on himself or the incidence in a planned manner. He plays the role of a link or a mediator between the actual situation and the received material. He does the job of using the various means of data compilation. These means themselves collect the material. Because of it, in this method there is neutrality and subjectivity and verification of facts is easy. This method is also called planned observation, created observation or arranged observation. In controlled observation data are collected through a decided and pre-planned scheme.

*Did You Know?* At present, controlled observation is used to study leadership, attack, and labours working in factories, children of children's home.

In controlled observation, below mentioned things are made clear- (i) units being observed are clearly defined, (ii) selection of the facts related to observation, (iii) determination of the condition, people, time and place of observation, (iv) writing down the schedule, (v) determining the instruments to be used in observation like photographs, maps, schedules, films etc. Since this method saves time, labour and money and objectivity, authenticity and credibility is maintained in the study, it is more used in studies done in special fields.

Controlled observation is done in two ways- 1. By keeping control on the situations being observed 2. By keeping control on the observer himself.

**1. Control over Situations—** Just as in natural science, scientists do the job of bringing the physical world's situation under the controlled conditions of a laboratory and studying them, in the same way social scientists also do the job of controlling and studying the social incidences under social conditions. That is why it is also known as social experiment, though like physical sciences, study of social incidences in a laboratory is not easy. In this method, control is applied on social incidences and situations and any special changes and their impact is made known. For e.g. through this method,we can study the impact of integrated rural development scheme and panchayat raj on a rural group. With the help of this method study of tiredness, study of time and speed, study of productivity and psychological study of children can be done.

**2. Control on Observer—** This is the second method of controlled observation in which observer, instead of the incidence, keeps a control on him. Nature of social incidence is such that it is difficult to keep a control on it. In such a situation observer may keep a control on himself to be saved of any favouritism or personal influence that may come on the study. To keep a control on the observer, instruments like interviews, schedules, tape-records, photographs, maps, regional notes, diaries, camera, films etc. are used. Telling the importance of control on the observer, Godey and Haute have written, "in social research, it is comparatively difficult to keep a control on the research, hence at least the observer should keep a control on his behaviour".

**3. Mass Observation—** In this method of observation, research work is not done by any single person but by a group of people. It is called mass observation. Clarifying it, Sine Pao Yeng has written, "Mass observation is a mixture of controlled and uncontrolled observation. This observation is dependent on observation of facts by other people and their scripting, though compilation of information and their use is done by one central person". By this definition, it is clear that (i) in mass observation, job of observation is done by many people together (ii) in it there is a mixture of both, controlled and uncontrolled observation (iii) there is division of work among all the observers and their jobs

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are integrated by one central officer. This method has been used in many countries. In year 1937, to study the nature, thoughts and life of the people of England and in 1944 to study the local conditions of Jamaica, this method was used. Since this method is an expensive method and it needs expert management, hence this method, instead of any person, is used by government and semi-government organizations. In this method, because of division of labour and because of the study of the incidences' social, financial, political, psychological and other aspects altogether, there is the benefit of receiving detailed information about it; however, it being an expensive methodology usually it is used very little.

## 9.3 Merits of Participant Observation

Importance of participant observation in social research is clear from it's below mentioned benefits or merits.

1. **Wider Information**: In this method, observer participates in all the activities of the group, hence, may collect wider information about it. Such wide information cannot be known through questionnaires, schedules, interviews and other activities.
2. **Minute and Intensive Study**: In this method of study, researcher is himself present at the point of happening of incidence and participates in the life of the group; hence he is able to deeply study smallest of thing about the group.

*Did You Know?* Expressing the depth and fine of this method, Jahoda and Cook have written, "active participation opens the doors of those sources of information, which otherwise might have remained closed."

3. **Direct Study**: In this method observer directly studies the social behaviour, hence his knowledge is more correct and scientific. Observer temporarily stays in the group, compiles the facts about the people's behaviour, activities, culture etc. in a direct form. Because of this he is able to establish intimate and informal relationship with the people.
4. **Study of Actual Behaviour**: Since participant observer is also accepted by the people of the group, they, before him, do not behave artificially as is done before the strangers, hence in this method; it is possible to study the actual behaviour of the people. Clarifying this fact, Jahoda and Cook have written, "Participation in communal life actually increases 'naturalism' in the situation of the observer".
5. **Greater Reliability**: Since in this method, observer himself collects the information, hence they are more reliable. Others turn and twist and present the incidence because of which incidences are not reliable, participant observation is free of this shortcoming.
6. **Verifiability of Collected Information**: In this method, facts collected by observer are verified also because observer himself participates in the activities of the group. Hence, in case of doubt, when the same situation arises, he can again verify the facts.
7. **Easy Study**: Since in participant observation, observer becomes a member of the group, no suspicion or distrust is shown upon him, without any restraint or interruption he may participate in all functions of the group and study them easily. Since the researcher does not have to go in the study area again and again, it is a comfortable method of study.
8. **Increase in the Skill of Observer**: Because of staying in the group for a long time and participating in its activities observer becomes experienced and skilled, he develops the ability to understand every situation.

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9. **Observer Himself is a Mirror of Community Life**: Participant observer gets so much mixed in the local group that he himself starts behaving like the other members of the group; his behaviour represents the observed group. Hence, much information about the group is revealed by his behaviour.

Other than the above-mentioned benefits, participant observation has some more benefits, like (i) in it, respondent's emotional condition can be easily understood. (ii) observer can find the answers for sensitive questions also (iii) in it analysis of sentimental and qualitative facts can be done easily (iv) it is easy to record the collected facts (v) in it observer's eyes become more minute and keen (vi) in less time, through this method, more information can be found.

## 9.4 Demerits and Limitations of Participant Observation

Despite many merits of participant observation it cannot be called a completely reliable or scientific method because it has demerits or limitations also:

1. **Full Participation Impossible:** M. N. Basu says, "A regional personnel, due to some practical reasons, cannot fully participate in the life of the group being studied". These words of Basu are absolutely true because in the study of prisoners or prostitutes, observer may live among them but it is difficult to develop their psychology, habits etc. in oneself. In the same way, during the study of tribes, living according to their traditions and customs is generally not possible for the researcher. Because of these difficulties only, American social-scientists like Gaden and Herskovits consider this methodology to be impractical.

*Notes* Lundbird's view is that this method is not useful for bedding groups. For e.g. a person stays in a Harijan colony and does its participant studies; but if the same person wants to go and study in a Brahmin colony also, then people will refuse to accept and provide information to him.

2. **Lack of Objectivity:** Because of living in the group being studied, observer develops the feeling of loyalty, intimacy, cooperation and attachment towards it; hence he is not able to compile the facts in an unprejudiced manner. In place of a neutral observer, he starts considering himself a member of a section, his scientific point of view comes to an end and he starts looking at the incidents in an exaggerated manner. Godey and Haute have truly said that, "as much he becomes a participant in emotional form, that much his subjectivity, which is his only huge asset, gets destroyed".
3. **Change in Group Behaviour:** Sometimes the observer receives an important position in the group and he himself starts influencing and changing the behaviour of the people. For e.g. if the observer is made the teacher of any school, *panch* or *sarpanch* of a *panchayat*, chairman of co-operative society etc. and by the influence of his own rights, virtues and personality he is able to bring a change in the behaviour of the people then he will not be able to do a scientific study of that group.
4. **Most Expensive Method:** Participant observation method is most expensive because it takes time to study through this method. As compared to other methods like questionnaires and schedules etc., more expense is incurred in this method.
5. **Study in limited Area:** One of the demerits of participant observation is that through it only a study of a limited area is possible because in it more time and money is consumed

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compiling information by establishing contact with all people is also difficult. Through such method, an area cannot be studied.

6. **Slow Study:** Since in participant observation intimate contact has to be established with people and it takes more time that is why study through this method happens in a slow speed. Hence, it is incapable in studying at a fast speed and drawing inference.
7. **Ignoring Ordinary Matter:** Participant observer stays for a long time in a group; hence, he ignores many incidences as an ordinary incident. As compared to this a stranger observer considers those incidences as new and attractive and studies them.
8. **Problem of Recording:** When observer himself is participating in the activities of the group then the problem of recording the information arises before him. Along with observation writing it may create a doubt about him among the people and if he records them after the happening of the event, there is always a possibility of forgetting or missing any fact.
9. **Difficulty in Role Adjustment:** Participant observer has to play two roles at a time—first of an observer and second of a member of the group. It is very difficult to make an adjustment.

*Notes* William White has written, "It is not a matter of a dramatic acting on an evening. It means—doing successful acting at all times. I think it is only doubtful to find such a successful actor who has an interest in research."

## 9.5 Merits of Non-participant Observation

Demerits of participant observation are the merits of non-participant observation. Mainly following are its merits or uses:

1. **Objectivity:** In non-participant observation observer does not mix himself with the group instead he sees the events like a neutral and impartial onlooker. With his presence events do not get affected, hence, the objectivity and scientific approach of the study is maintained and favouritism cannot come.
2. **Reliability**: In such kind of studies, observer sitting at a distance notes down all the incidences himself, hence the information collected by him is more reliable.
3. **More Co-operation:** In this observer does not mix and mingle with any specific group of the community. Hence, he receives the respect and co-operation of all the people.
4. **Less Expensive:** In non-participant observation, as compared to participant observation, less time and money is spent.
5. **Spectator May Enjoy More than an Actor:** As a spectator a non-participant observer may acquire wide, minute and actual information which is not possible for participant observer because in comparison to an actor, spectator can truly evaluate the object—situation of a drama.

## 9.6 Demerits or Limitations of Non-participant Observation

Despite the various merits of participant observation, it has below mentioned limitations:

1. Godey and Haute's view is that pure non-participant observation is difficult. Observer has to be participant to some extent.

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2. Non-participant observer sees the incidents with his point of view, hence their originality gets destroyed.
3. Certain subjects are such, whose information can be attained only through participant observation. There this method is unsuitable to all intents and purposes.
4. In non-participant observation sometimes it is not possible to study the event that happens all of a sudden.
5. People of the group look at the non-participant observer with suspicion and start behaving artificially before him.
6. In this only superficial knowledge is gained about the problem, not wide and deep.

## 9.7 Distinction between Participant and Non-participant Observation

1. **On the Basis of Participation:** In participant observation, researcher by becoming an integral part of the community or group participates in all their activities, whereas in non-participant observation he studies like a neutral and silent onlooker.
2. **Difference in Depth:** In participant observation deep, minute study of incidents is possible and secret information can also be compiled, whereas, it is not possible in non-participant observation.
3. **On the Basis of the Behaviour of the Group:** In participant observation people of the group consider the observer as their member only, hence behave naturally before him; whereas in non-participant observation observer is considered to be an outsider and stranger before whom artificial behaviour is demonstrated.
4. **On the Basis of Verifiability:** In participant observation, researcher gets many opportunities to verify the credibility of events, whereas in non-participant observation opportunities for verification of events are limited.
5. **On the Basis of Time and Money:** As compared to non-participant observation, more time and money is spent in participant observation.
6. **On the Basis of Objectivity:** In comparison to participant observation non-participant observation is more scientific and objective and in that the possibility of partiality by a person is less.
7. **On the Basis of Instruments of Study:** In participant observation, observer cannot make use of observation card while in non-participant observation, observer makes use of scheduled observation cards etc.
8. **On the Basis of Skill:** Researchers of participant observation should be more skilled and trained whereas in non-participant observation, study is possible on the basis of general experience and skill only.

## Self Assessment

Fill in the blanks:

1. Observer does not mix and mingle with any _____ of the community.
2. In non-participant observation, people of the group look at _____ with suspicion and start behaving artificially before him.
3. In _____, people of the group consider the observer to be their member only.

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## 9.8 Summary

- Through observation, compilation of primary data and its minute and deep study and unbiased study are done.
- Observations are of three types:
  - *(i)* Uncontrolled observation
  - *(ii)* Controlled observation
  - *(iii)* Mass observation
- Under uncontrolled observation, participant, non-participant and quasi participant observation are included.
- "Participant observation means a situation in which the observer himself also participates in all the normal activities of the group being studied." P. H. Maan.

## 9.9 Keywords

1. **Observation:** Method of looking at an event or object in a minute and arranged manner, testing and recording it, is called observation.
2. **Merits of Non-participant Observation:** Demerits of participant observation are the merits of non-participant observation.

## 9.10 Review Questions

1. Tell the meaning of observation.
2. Give a short description of the types of uncontrolled observation.
3. Describe the merits-demerits of participant observation.

## Answers: Self Assessment

1. Specific group
2. Observer
3. Participant observation.

## 9.11 Further readings

*Books* 1. Research Methodology—Dr. Ganesh Pandey, Arun Pandey, Radha Publication.

2. Social Science of Education—Tiwari Sharada, Arjun Publishing House.

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# Unit-10: Ethnography

CONTENTS



## Objectives

After studying this unit students will be able to:

- Attain the knowledge of ethnography field work
- Know the difference between the daily activities of reality and the scientific beliefs.

## Introduction

Method of preparing a detailed descriptive account of customary behaviour, beliefs and psychologies of any society is called ethnography. It is a branch of cultural anthropology. It is mostly prepared by field-work. It is generally related to the descriptive study of the primitive or pre-educated society. In this branch of knowledge, as compared to analysis and narration, importance is given to description only. In ethnography, mostly research method of participant observation is used. A branch of cultural anthropology that deals with the comparative study of cultural elements of various societies is known by the name of ethnology. What is the difference in the cultures and what are the reasons behind these differences is the main subject—matter of study in ethnology. Ethnography and ethnology are two different concepts. In ethnography a few communities are only described, whereas in ethnology, on the basis of material received from ethnography, efforts are made to search the principles. For this comparative study of material of various communities is done.

## 10.1 Ethnography Field Work

Through ethnography field-work, humans make a scientific study of social events and communities. In this ethnographer stays with those people like normal life and studies those communities through field-work and also keeps such people of those communities with him who may collect the right information. Such ethnography's time may be usually one year or more or sometime this job may go on for a long time also. In it ethnographer completes the field-work and writes about his experiences. This written record is a schedule of daily life in which along with mentioning of incidences, assortment of many proceedings and events is also included.

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*Notes* Many people in it are such who are working on various subjects of ethnology, such as for life sciences, supply of food available or for geology study may be done of that area and its environment.

Ethnologists study all human experiences; ethnography is an important field of anthropology. Some anthropologists do their research by sending other people in the field work. Some advertising agencies also use the work of ethnographer, in this context that, for that population or community, what kind of advertisement will be more effective.

People who want to make a career in this field have to first study cultural anthropology. If possible, such students should be motivated to participate in field-work getting done by the school. A good ethnographer is skilled in statistic calculation. There should be an efficiency to suddenly write any situation in a new language. Most important, in him, observation, cataloging and the efficiency to understand a language and write should be in-built.

An ethnologist is such a person who collects records of the data about anthropology and society. Various type of research methods are there, which can be applied to various fields of design sub-categories of sceneries. An ethnologist, geography, education, linguistics, economics and social work's form, works for various fields. An ethnologist may be used to better understand the society.

Local ethnology is an important field of this subject. Some ethnographers use feeter band method. They go around various places and do interactive work with the people and record their thoughts. They go to some specific cities or places and also study what is the impact of government policies on them.

Ethnology methods are primarily used by anthropologists but often, sociologists also use it. This method is used mainly for cultural study and for fields of economics, social work, folk tales, religious studies, geography, history, linguistics, communication studies, study of presentations, advertisements, psychiatry, crime etc.

## Self Assessment

Fill in the blanks:

1. People, who want to make _____ in this field, have to first study cultural anthropology.
2. Most important, in him, observation, cataloging and the _____ to understand a language and write should be in-built.
3. An _____ is such a person who collects records of the data about anthropology and society.

Generally, ethnology methodology should not be evaluated from philosophical point of view. Actually it contributes in developing our understanding about a piece or small part of social life. It brings prosperity our beauty iconography. In it, researcher's awareness should be maximum because risk is maximum in deciding about oneself that is why, while studying any culture or subject, one should be value-indifferent. The natural demand of ethnological investigation is that in the field of research from qualitative and qualitative point of view, formal and principle ethics are adapted according to time. In this entire process, ethical dilemmas are present. There is need to be saved from maintaining false professional reputation and from possibly sharp results.

*Task* What do you know about ethnography field-work? Briefly describe.

**Notes**

Ethnologist's natural characteristics affect the value of research, that is why some important principles should be followed to design sampling data, to observe and to record.

- While studying any group, its representative meaning and talk patterns should be connected together and seen.
- Any fact should be investigated with subject focussed point of view. Difference between daily activities of reality and scientific beliefs should be maintained.
- Efforts should be made to establish relations of representatives of group and its meaning with social relations.
- Record should be kept of the behaviour of the people of the group or community.
- Changes in the process of study and various stages of stability should be made clear.
- Representational work should be considered to be a part of interactive work.
- To be saved from sudden clarification, hypotheses must be used.

## 10.2 Summary

- Through ethnography field-work, man does a scientific study of social incidences and communities.
- Usually ethnology methodology should not be evaluated from philosophical point of view.
- There is need to be saved from maintaining false professional reputation and from possibly sharp results.

## 10.3 Keywords

1. **Ethnography field-work**—Primarily, knowledge about the fields of cultural study, economic work, education, folk tales, religious studies, Geography, history etc. is called ethnography.

## 10.4 Review Questions

1. What do you know about the subject of ethnography? Describe.
2. Ethnographer first and foremost records data of which things?
3. What is the difference found between daily activities of reality and scientific beliefs?

## Answers: Self Assessment

1. Career 2. Efficiency 3. Ethnologist.

## 10.5 Further Readings

*Books*

1. Social Survey and Research-Vandana Vohra, Radha Publication.
2. Research Methodology-Dr. Ganesh Pandey, Arun Pandey, Radha Publication.

# Unit-11: Case Study Method

Notes

CONTENTS



## Objectives

After studying this unit students will be able to:

- Attain knowledge of procedures in case study
- Learn the utility of case study
- Learn the precautions taken in case study.

## Introduction

For an intensive study of various important problems of social sciences, case study process or method was developed. It is one such process in which social units (person, institution, community etc.) are seen in an overall manner. Leplay and Herbert Spencer had first used this process. For qualitative study, case study method is considered to be the best.

## 11.1 Definition and Meaning of Case Study Method

1. Pauline V. Young- "process of research and analysis of life of any social unit—whether it is a person, a family, institution, cultural section or entire community, is called case study".

Notes

2. Goode and Hatt—It is one such method of organizing social facts in which individual nature of the social subject being studied is protected. In a little different form, it is a process in which social unit is seen in an overall manner.
3. Biesanz and Biesanz—Case study method is that form of qualitative analysis in which individual, situation or institution is carefully inspected.

From the above-mentioned definitions it is clear that case study method is that process of social study in which researcher studies any unit (individual, situation, community or situation) on the basis of all available resources, with such depth and closeness that internal knowledge of the subject is possible.

## 11.2 Characteristics of Case Study Method

On the basis of above described definitions, the main characteristics of this method can be mentioned as below:

1. **Individual Basis of Research:** In this method, researcher takes one unit only and studies it. The meaning is that this unit of study may be individual, institution, situation, caste, community, anything, but its study is done in the form of an individual or a unit. In this way, in this process, basis of study is individual.
2. **Intensive Study:** In this process, unit related to the problem is studied intensively. Intensive study may take as much time and this may go on for a long time this way, through this method, intensive–to-intensive information may be compiled.
3. **Whole Study:** This process studies any social unit in a whole or complete form. Meaning of wholeness or completeness is to accomplish the study of the life of the unit from the social, economic, political, geographic, religious, life scientific, psychological, etc., all points of views. In this relation Goode and Hatt have rightly written "It is an approach which views any social unit as a whole."
4. **Qualitative Study:** In this approach, qualitative study is done—actually study of units is itself qualitative and analysis of facts is also not done in form of numbers. Fact is that in this method, in form of a story, a detailed life-history is prepared.

### Self Assessment

Fill in the blanks:

1. It is one such method of _____ social facts in which individual nature of the social subject being studied is protected.
2. Case study method is that form of qualitative analysis in which individual, situation or institution is _____ inspected.
3. Meaning of _____ is to accomplish the study of the life of the unit from the social, economic, political, geographic, religious, life scientific, psychological, etc., all points of views.

## 11.3 Procedure in Case Studies

In case study method, every possible effort is made to do a systematised study of an individual situation. In reality, this systematised study is very difficult, still to accomplish it in an organised manner, below mentioned procedure is followed.

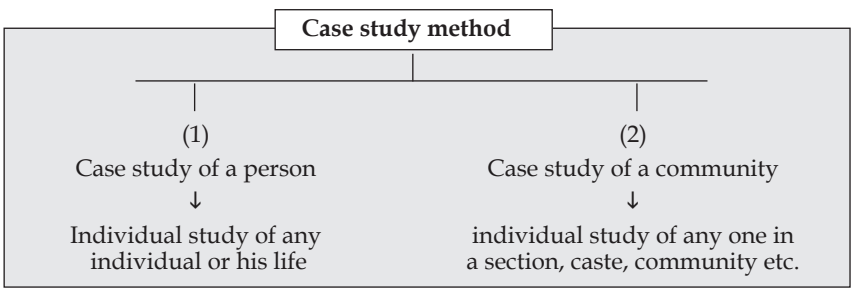
Notes

1. **Statement of the Problem:** Before using case study method, it is important to describe or mention various aspects of study-practicable problems so that for complete study, all information of past and the present may be compiled. At this level, it is important to ensure the following things:
   a. **Selection of Cases:** In it case has to be definitely selected, so that the problem may be highlighted. As per the problem, this case may be anything ordinary, general or special.
   b. **Types of Unit:** In this, it needs to be determined, which type of unit needs to be studied. Does study need to be done of an individual, caste, institution, unit or community? It is better and important to decide this.
   c. **Number of Cases:** After deciding the type of units, it is right and important to decide appropriate number of cases to be studied.
   d. **Field of Analysis:** It needs to be decided in this that in present study, it is important to highlight which aspects.
2. **Description of the Course of Events:** After describing the time, in one form of a problem what changes have come over a definite period of time and what changes are expected in future, an organized description of this is also important.
3. **Determinant Factors:** At this level, it is important to study those determinant factors because of which this incidence or problem has happened. For e.g. after knowing the life-story of a juvenile–criminal, it is also important to know those basic reasons because of which such a child became a juvenile–criminal.
4. **Related Influential Factors:** Other than the determinant factors, it is also important to find out other related influential factors, because these influential factors also affect the form of incidence in some or the other manner. In fact, from the point of view of completion of problem, it is important.
5. **Analysis and Evaluation:** At this level, after analysing the received information, analysis and evaluation is taken out.

This is the blue print of the procedure of the case study method.

## 11.4 Types of Case Study Method

Case study method has been divided in two parts. It will be clear from the below shown flow chart:




## 11.5 Sources of Data of Case Study

Sources of data of case study may be divided in two parts:

(a) Written or secondary material (b) Compiled or primary material

Notes

**(a) Written Material:** Written material is in the form of biographic diary, life-history, letters, creations of literature, writings etc. Through these, much matter may be received about case study. Diaries are written about the people themselves. In these, people themselves write important incidences, memories etc. of their lives. Allport says, "diaries are self-published records which knowingly or unknowingly describe the dynamics of the mental life of the writer." As such, through letters, written material cannot be found, but in certain cases, important information may be received, which may not be possible through other sources. In life history, entire life of the person is presented. Hence, from this point of view, life-history has an important place in this method.

*Notes* In case study method, support is taken of some other documents also. Under these documents, books related to the problem, magazines, records and notification from the government and non-government institutions, reports related to the past and present researches, government and non-government publications etc. are included.

**(b) Compiled Material:** Sometimes, information has to be specially compiled. Such information is compiled through interview of the related person or through apparent observation. From which source, which information should be received, there is no definite rule for this. As per the need, any source may be used.

## 11.6 Precautions Taken in Case Study

Following precautions should be taken in case study:

1. An individual's study should be done in his social background.
2. Importance of family and other primary groups in the life of the individual should not be forgotten.
3. Efforts should be made to know those facts about the individual through which description may be made about the entire life of the person.
4. The incidences of the person's life should be presented in exact manner.
5. People should be chosen for study from the related geographic area only.
6. Only a trained person should be made in-charge of this study.

## 11.7 Utility or Importance of Case Study

Utility or importance of the case study method may be made clear from the following description.

1. **Intensive and Microscopic Study of the Problem:** Although through this method only cases can be studied, but doing only a complete, intensive and microscopic study of their various aspects is the job of this process.

*Did You Know?* This method, because of its intensive and microscopic nature only, is very useful in social research.

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2. **Study of Unique Aspects:** Through sources like diary, life-history, letters, interviews, investigations etc., study of unique aspects of individual situations is possible through this method.
3. **Study of Group Characteristics:** By studying various individual cases and by including the received facts, the group characteristics of the entire group can be easily inferred.
4. **Source of Experience for Social Investigator:** In this method, investigator gets an expansive field of experiences because in this method, microscopic to microscopic aspect of the social unit is studied and in the same form investigator receives many experiences which possibly is not possible in other methods. In this manner, investigator may use the benefits of his experience in the investigation of further studies.
5. **Study of Dominant Factors in Life:** Because of the intensive and microscopic study, those facts also arise or become clear that, in the activities of person or the case which are the dominant or determining factors?
6. **Study of Personal Feelings and Attitudes:** Because of being a microscopic, qualitative and intensive study, study of feelings, values and attitudes of person is automatically done. In this manner by knowing the attitude of the feelings, values etc. of the person, inference can be made about the social change. Actually, in social research, study of feeling and attitudes is very helpful.
7. **Primary Form of Statistical Study:** Case study is in a way a primary form of case study. By doing the case study of social units, base can be presented for statistical studies to be done in future because on the basis of its experience statistical study can be made more organized.
8. **Completeness of the Material:** Material received through this method is complete in itself. This is the most excellent utility of this method.
9. **Helpful in the Preparation of Questionnaire, Schedule and other Forms:** Through case study, information is received on important matters, and on the basis of these received information and experiences questionnaires, schedules and other forms can be prepared in an organized manner**.**
10. **Easy in Finding Group Sample:** Through this method, attributes of various units of the group are known and on the basis of this it becomes easy to classify or divide the units in various groups. After this much is done, classified sample can be comfortably found.
11. **Source of Hypothesis:** Through intensive, expansive and microscopic study of many units, substances can be reached out to, that is to say, generalisation can be done. On the basis of these substances hypotheses can be developed for the researched to be happened in future.

## 11.8 Limitations of Case Study Method

In the field of social research, case study method is quite useful and important, still this method has its own limitations. These limitations, demerits or disadvantages are as follows:

1. **Conclusion on the Basis of Few Units:** The biggest limitation of this method is that in it, inference id derived on the basis of study of few units. Applying the inference derived like this to all the units is nothing else but deception.

*Task* A person is arrested by the police again and again but his police record might not be based on reality but bias. In such situation how can correct inference be derived, using case study method?

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2. **Defective Records:** In study of this method, more emphasis is laid on previous records but usually it is doubtful that the previous records are actual and correct.
3. **Unscientific and Unorganized Method:** In this method, in selection of units and compilation of information, there is no control and neither support is taken of any scientific or organised technique. In this view, it is an unscientific and unorganised method.
4. **Possibility of Bias:** One limitation of this method is also that because of the study of those events only, that they come in his life, there is always a possibility of bias.
5. **Not Based on Sampling Method:** In this method only selected units are studied but selection of these units is not based on sampling method. In such situation, study of representative units is not done.
6. **Unverified Facts:** In this method, whatever information and material, investigator compiles related to the life of a person, verification of it is not possible because,in the life of the other person whom he would be studying, same events or situations are not happening. In this way, unverified inferences are received.
7. **More Time and Money:** In this method much time is taken to study few individual cases or persons. Not only is this, along with time, expenditure is also much. Due to it, this method is quiet expensive and time taking.
8. **Limited Study:** Despite using more time and money, through this method, only qualitative study of units is done. From this point of view, this method is a limited study method.
9. **Defective Life History:** In this method, life history is an important source of information compilation but sometimes life-history is also defective and unscientific. Being written by the people themselves, events may be written in an exaggerated manner and normally person writes down the events of his choice. In such a situation incorporation of unscientificness in generalization and inference is natural.
10. **Read Bain has Told the Following Demerits of Case Study Method:**
    a. It does not give such information about the event which is impersonal, acceptable to all, full of ethical base, impractical, frequent.
    b. Related person, instead of giving the correct information gives such information which, as per his understanding, investigator wants.
    c. Respondent instead of telling the facts gets specially inclined towards self consent.
    d. Literal feelings of the people motivate them to exaggerate and leave the actual facts and include imaginative facts.
    e. Its data are usually not comparative.

*Task* What are the limitations of case study method? Explain extensively.

## 11.9 Evaluation

From this investigation, it is clear that in social research, case study method has an important place but along with this important place, this method has certain limitations and demerits also. Limitations and demerits may be removed to some extent by an experience researcher. Knowledgeable persons like

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Carl Rogers, Elton Mayo, Mira Komarovsky, Kinsey, Dollard etc. have made important improvements in compilation of data, publication methods; writings etc. related to this method and in this method, continuously improvements are being made.

In our country, seeing the demerits of this method, often researchers hesitate in accepting this method. Actually this point of view is not correct demerits; to quite an extent may be removed by a trained, skilled and experienced investigator. Whatever happens, it cannot be unaccepted as a method of social research because looking at the qualitative method of social incidences, and it is the only method to do an intensive and microscopic study. Hence it is more appropriate to say that "whatevermayhave been said against case study method, but it is a fact that to study social environment, this method will remain a fundamental".

## 11.10 Summary

- To study many important problems of social sciences, case study method was started. Firstly Liplay and Herbert had used this method.
- Sources of data of case study has been divided in two parts:
  a. Written or secondary material
  b. Compiled or primary material
- In this method, efforts should be made to know those facts about the individual through which description may be made about the entire life of the person.

## 11.11 Keywords

1. **Case study method:** Case study method is that process of social study in which researcher studies any unit (individual, situation, community or situation) on the basis of all available resource; with such depth and closeness that internal knowledge of the subject is possible**.**
2. **Wholeness or completeness:** the study of the life of the unit is done from the social, economic, political, geographic, religious, life scientific, psychological, etc., all points of views.

## 11.12 Review Questions

1. What is the meaning of case study method?
2. What are the sources of data of case study?
3. Which procedure is used in case study?

## Answers: Self Assessment

1. Organising 2. Carefully 3. Wholeness or completeness.

## 11.13 Further Readings

*Books*

1. Social research and statistics - Ravindra nath Mukherjee.
2. Social survey and research - Vandana Vohra, Radha Publication.

Notes

# Unit-12: Content Analysis

CONTENTS



## Objectives

After studying this unit students will be able to:

- Know the meaning of content analysis.
- Know the importance of content analysis technique.

## Introduction

Everyone accepts this fact that in comparison to material incidences, social incidences are more complex, dynamic, shapeless and qualitative, because of which social sciences have a problem in finding their own inferences and formulating rules. In the direction to reduce this difficulty, content analysis technique has an important contribution because with the help of it, quantitative and objective description becomes possible. Some investigators divide the contents of facts related to study subject, and consider only their objective analysis as "content analysis".

This technique was started nearly 75 years from today, in year 1926, Malcolm Willey had used it through his study of newspapers. After that in 1930, Boodland etc. had done under a study titled, "*Foreign News in American Morning Newspaper*". In this study, by analysing the languages of newspapers, some important inferences were taken out. In these studies, content analysis technique was only used. Although at that time this technique being at its initial stage had not attained any definite character or base because the ones doing these studies were not any trained social researchers but were personnel related to newspapers only. In a similar manner, other personnel related to various newspapers also presented analytical study of the contents of the information or news printed in the newspaper, related to subjects like household matters, politics, labour, crime, divorce, sports etc. following then, some authors also used this technique in study of literature genres. Slowly this technique was started to be used in political science and public-opinion studies also in the period of 1930-1940, Harold Lasswell and other knowledgeable men, in their studies related to propaganda and public opinion, tried to further develop the content analysis technique. After the Second World War, investigators started to use this technique a little less. Now again, its use has increased and in the study of content of music, education, literature, radio programmes, newspapers etc, this technique is becoming popular.

## 12.1 Definition and Characteristics of Content Analysis Technique

Notes

Defining content analysis technique, Weples and Barelson have written, "a well organized content analysis, in place of merely presenting the account of the material, tries to make a more than that clear explanation so that it is possible to express the nature and relative truth of the motivation being imparted to the readers or audiences in an objective manner ".

From the above definition it is clear that analysis technique is the analysis of that content which is presented for the readers or audiences. This technique is not an accountable explanation of this material, but presents such explanation which is more clear and objective and through the medium of which the nature and realities of the motivations being imparted to the readers or audiences, are manifested in a scientific manner.

Bernard Berelson in his communication researches has developed a very good definition of content analysis. As per him, "content analysis is a research technique adopted for an objective, orderly and quantitative description of the manifested content of communication."

It is clear from the definition of Berelson that we use the content analysis technique for scientific description of that content of communication, which, instead of being latest, is manifested, that is to say, is investigable in external form.

In words of P.V. Young, "content analysis is a research technique adopted for orderly, objective and quantitative description of content of research facts obtained from interviews, questionnaires, schedules and other written and oral linguistic expressions".

Clearly, Young's definition is quite a lot an amended form of the above-mentioned definition presented by Bernard Berelson.

From the analysis of above-mentioned definitions only main characteristics of content analysis technique become clear, still we may present them in an orderly way in the following manner:

1. This method is related to content of facts obtained from communication and linguistic expressions.
2. Under this technique, that content is analysed which is manifest, that is to say, which for a scientist, is investigatable in an external form.
3. Through this method we analyse the content of those facts which are obtained through any sources of communication or linguistic expressions, whether they are written or oral.
4. The objective of this technique is to make an objective, orderly and quantitative description of this content. In this way, this technique keeps itself away from qualitative description.
5. In this form, basis of this technique is scientific and it finds out such results, test and re-test of which, in relation to accuracy is possible.

### Self Assessment

Fill in the blanks:

1. This technique is not an _____ explanation of this material, but presents such explanation which is more clear and objective.
2. It is possible to express the nature and relative truth of the _____ being imparted to the readers or audiences in an objective manner".
3. This method is related to content of facts obtained from communication and linguistic _____.

## 12.2 Importance of Content Analysis Technique

In the field of social investigation and research, content analysis technique has a unique importance and it is itself clarified by the following explanation:

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1. Quantitative study of qualitative subjects is possible through this technique. For example, characters of a novel, or a lecture or editorials of a newspaper are all qualitative subjects. But content analysis technique can present the quantitative description of nature and attributes of these qualitative subjects through the medium of tables, graphs etc.
2. To clarify the nature of various means of communication, a content analysis technique gives its important contribution. Means of communications such as books, lectures, newspapers, radio programmes etc. are important in impacting and directing our social life, but their nature and impact, both being shapeless, generally we are not able to obtain correct knowledge about them. Content analysis technique overcomes this demerit. With the help of this technique we are not only able to understand the nature of various means of communication but also we are able to obtain scientific knowledge related to the nature and limitation of impact of these means on the people.
3. Comparative study of international basis of communication is also possible with the help of this technique. Content of communication means of every country is not similar, but their extension can be international. Because of this, their impact also crosses the boundaries of the country.

*Notes* It is very important to localize the health basis. This job is possible only when comparative study is done of the international bases. Content analysis technique provides us this opportunity through which we can make a comparative study of communication means of various countries.

4. Study related to the nature of the impact on the people, of the methods of propaganda, can also be done in a scientific manner through this technique. Through this kind of study, help may be obtained in making the means of propaganda more impactful discovering new methods and techniques of propaganda.
5. Knowing the public opinion has also become easy today, with the help of this technique. By doing a content analysis of the letters written by the members of the public, in the name of editors of newspapers, many investigators have been successful in finding out the posture of public-opinion.
6. This technique has proved helpful in the study of personality also. On doing a content analysis of a lecture given by a specific person or a book written by him, writing etc., thoughts, principles, values, psychology, passions, sentiments etc. hidden in the personality of that person himself are made clear. On the basis of these uniqueness, categorization of various personalities is also possible.
7. Study of psychological bent of a group or community is also possible through this technique. On doing a content analysis of subjects of writings printed in newspapers and magazines, stories, radio programmes, advertisements etc. psychological bent of a group or specific community itself gets known. Through this, administrators, social-workers, those who make schemes and leaders of the country get a lot of help in addressing and organizing their job.

## 12.3 Limitations of Content Analysis Technique

Despite of the above importance content analysis technique has its own few limitations and the main being that the study subject itself being qualitative, finding the results becomes a problem in itself. Because of the nature of study being qualitative it is very difficult to test the reliability of facts related

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to these. To be saved from this problem, extreme precautions need to be taken during the study work. Only because of the qualitative nature, it is not easy to find the reality of analytic description and inference. There is so much variance in the means of communication itself that it becomes difficult to say that the inference we have drawn on the basis of one study, can be applied on all such subjects or not. Along with this, speed of change in the content of these means is so fast that today's inference is proved useless in some time itself.

*Did You Know?* One limitation of this technique is that this technique cannot be used in field-work. Despite of all these limitations, this fact cannot be denied that with the help of this technique, many scientific studies have happened and our knowledge has increased with those studies.

## 12.4 Summary

- This method is related to content of facts obtained from communication and linguistic expressions.
- Quantitative study of qualitative subjects is possible through this technique.

## 12.5 Keywords

1. **Content Analysis:** Method of objective, organized and quantitative analysis of content, expressed in written, oral or spectacular means of communication is called content analysis. It is being used in the field of radio, Doordarshan, science of literature, music, education.
2. **Definition of Content Analysis Technique:** Young has emphasised that content analysis is related to research data obtained through linguistic expressions and through this research method we try to present an orderly, objective and quantitative description of this content itself.

## 12.6 Review Questions

1. What are the specialities of content analysis technique?
2. What are the limitations of content analysis technique? Mention.
3. What is the importance of content analysis technique?

## Answers: Self-assessment

1. Accountable 2. Motivations 3. Expressions.

## 12.7 Further Readings

*Books*

1. Methods of social research-Sanjeev Mahajan, Arjun Publishing House.
2. Saidhaantik Samaajshaashtra-Dr.Ganesh Pandey, Arun Pandey, Radha Publication.

Notes

# Unit-13: Oral History, Narratives

CONTENTS



## Objectives

After studying this unit students will be able to:

- Other than written proofs, analysing the facts in oral form.
- Oral analysis based on facts like sources based on folktales, memories
- Doing analysis of narrative research in form of qualitative research.

## Introduction

One of the limitations of oral history technique is that in this, interviewer has to fully depend on his memory power because while taking the interview, interviewer is not in a situation that he may note down all the information. He writes down the information only on returning to his home after finishing the interview.

## 13.1 Oral History

Oral history is one more instrument in the list of presentation of those having an interest in interviews, history, anthropology and folktales etc. It is a medium of observation in the past and collecting information about the past through participation. It collects the data and facts about the incidents, people, different decisions and reaction, unavailable in written documents.

*Notes* Roots of an oral history interview are attached to the memory and it is a subjective instrument of recording about the past through memory in which shape is provided through present moments and personal psychology.

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Oral history may inaugurate personal values and activities through which past has been built up and also clarifies that how does past provides a shape to the present values and activities. Every interview experience is unique in itself and is an attractive part of work field. Because of this, to some extent it is applicable in the popular saying that, to learn how to do a job, the only way of it is to do the job. This is the reason why every interview taken after an interview is more successful.

The new art of study which is being developed, in that folk history is being used to a large extent, one that was history of narration, narrative history, is being used in history different from that. Such narrations are based on oral narrations.

As long, his speech power is concerned human stambh praani, who completely couldn't become human, limited speech power developed it. However, big human's throat composition, mind's composition and speech power, relation in them just missed from happening. But speech power voice ability to give meaning to words, we have received in heritage. Verbalism came before, scripting after that. But verbalism today is also more important than scripting. What we have to say, we can say it by writing also, but from the point of view of transmission,verbalism always have to be resorted to for transmission of our thoughts.

From the point of view of continuity and from the point of view of change, we will have to look at the tradition of verbalism with seriousness. It is also true that what is scripted tradition, in development of it, oral tradition has a very strong hand. After all *Panchtantra, Hitopdesh,* or different from that, *Sahastra Rajni Charitra,* these were developed through oral tradition only. These got scripted and matter of surprise is that this scripting gave birth to new oral tradition. There is a famous poet in Aligarh, who when he recite a poem then it feels very good, but when we read the same poem it doesn't feel so good.

## Self Assessment

Fill in the blanks:

1. Oral history may _____ personal values and activities through which past has been built up.
2. To some extent it is _____ in the popular saying that, to learn how to do a job, the only way of it is to do the job.
3. The new art of study which is being _____, in that folk history is being used to a large extent.

## 13.2 Narratives

Narrative research points towards any such studies which analyzes narrative material and its limit may expand from narrative that happen naturally for research purposes to oral stories of life. Its purpose is found in written narratives in personal, public or political fields. One out of the given main reasons that why many social scientists have interest in narrative studies is because narrative is a fundamental human method of building the conscious of the world. Narrative analysis is primarily centred on written or oral lessons but it can also be used in analysing photographs, films or dance presentations. Narrative analysis is essentially vested in interdisciplinary view. Fields are comparatively uneven and there is no single method of analysis which should be used by narrative researcher.

The main reason behind the present popularity of narrative analysis is the narrative or linguistic trend in social science. In it social internal activities (anth kriya) and a re-renovated (punarnavinikrat) interest is brought forward, in which language plays an important role. Language is not neutral but is a medium to bring inequality in social objectives and in this way, is trapped in the framework

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of power. In this manner a descriptive viewpoint, in reaching notable events, does not demand for analysis of narrative, but, is centred on interpretation building.

*Did You Know?* Most narrative analysis are based on the notion that how does experience, because of being restructured and explanatory in itself is important.

## 13.3 Summary

- Oral history analysis is based on sources like facts based on memory, folk tales.
- In building of scripted tradition, verbal tradition has a very big hand.
- Narrative analysis is essentially vested in interdisciplinary view.
- Narration is a fundamental way to build consciousness of human being of this world.

## 13.4 Keywords

1. **Interview Method:** Process of formal discussion for a specific purpose, with a person or group, is called interview method.
2. **Interdisciplinary Research:** Social incidences are multi-meaning whose medium is beyond the limit of science. When many knowledgeable men, as a group, do research work on these incidences, because of the complexity, then it is called interdisciplinary research.

## 13.5 Review Questions

1. Analyse oral history method under the qualitative analysis method.
2. Under qualitative analysis, how is narrative research done?

## Answers: Self Assessment

1. Inaugurate 2. Applicable 3. Developed.

## 13.6 Further Readings

*Books*

1. Classical Social Thought-Agarwal Gopal Krishna, Bhatt Brothers.
2. Research Method-Dr. Ganesh Pandey, Arun Pandey, Radha Publication.

# Unit-14: Methodological Dilemmas and Issues in Qualitative Research

Notes

CONTENTS



## Objectives

After studying this unit students will be able to:

- Get information on methodological dilemmas in qualitative research
- Understand the problems in social incidents.

## Introduction

It is true that social incidents and natural incidents are not of same nature, there are some fundamental differences. For example, in a particular variety of mango tree all the trees would have same specialities but this would not be true for a group of teachers. We can definitely say that the order of seasons would behave in a definite manner but we cannot be sure of the behaviour of students during the college elections. It can never happen that we get sunlight at night, but it may be possible that a mother murders her own child. Social incidents are full of such weird, bizarre and different incidents.

## 14.1 The Complexity of Social Phenomena

One noteworthy speciality of social phenomena is their complexity. Lundberg writes that possibly the most noteworthy difficulty in a practical science—Human-group-behaviour is the complexity of

**Notes**

its subject-matter. Due to the so much sensitivity caused by the physical and social effect and along with its innumerable cultural, psychological and mind tempered specialities human behaviour seems to be so complex, abstruse that the human mind does not think of entering into the world of complexity to find solutions to sequence of human groups, organizations and rules. Two examples of the complexity of social phenomena can be presented here: A husband can become an obedient servant for his wife but yet another husband may not be ready to accept anything lesser than that for a "God"; it may also be that a third husband behaviourally considers their relationship as a kindred one and accordingly behaves with his wife; but a fourth husband considers his wife as a mere object for cooking and producing babies and have fun with his friends and peers whereas a immoral husband who thrashes his wife may become a 'good husband' anyhow in one night; a husband is sad and shameful about his dark-coloured wife whereas another husband may be playing love-games with other women in clubs etc. leaving his beautiful wife crying at home; one husband lives for the love of his wife while another may die craving for the love of his wife. Likewise this book can be filled with such examples; yet the complexities of husbands would keep on increasing. Very few people will like to get involved in such complexities.

From this example it is clear that social phenomena are quite complex. Human behaviour is influenced by various factors such as physical, social, psychological, financial, etc. Therefore, which factor has how much influence is difficult to understand. These factors are not only many but are also changing- we don't know which thing impacted that immoral husband and he changed to a good husband in one night itself. Not only this, even if we find out all the factors affecting any social relation or behaviour then also it would be difficult to find out the relative effect or importance of these.

But from such difficulties it does not mean that it is impossible to give a definite place to scientific methods. Even in such difficulties it is possible to search for truth. This opinion is based on the following principles of Lundberg-

(A) It is true that social phenomena are difficult. Some patterns, sequences and orders can be also be seen in any difficulties relating to behaviour of social groups. Superficially these behaviours are complex but this difficulty does not mean mismanagement, emergency or uncertainty and there cannot be any future prediction about this. Opposite to this if we pay attention then we will find out that there is no lack of certainty, management, sequence and similarity in the behaviour of social humans or groups. Therefore, under a definite situation it is possible to do scientific study and predict future of their behaviour. We can tell that a particular person will do particular definite works at a particular time—He will eat dinner during the first phase of night not at mid-night; he will not sleep at daytime but during night; he will pray in the morning, not in the afternoon; he will not marry in his closest blood-relations, etc. This type of analysis can be done in certain social groups who behave in definite manner under given conditions. Therefore, the behaviour of social groups is unorganized, complex and un-meaningful for only those who do this superficially. The more we study it and to the greater depth we try to reach the more it becomes organized, certain and predictable.

(B) Lundberg has further written that in pessimistic complexity and un-organization in the social behaviour disappears if we do more in-depth study. This fact also explains the real nature of difficulties. In his words, "Any situation or behaviour is difficult till we do not understand it. Difficulty is always relative: for a particular behaviour subject our information may be complete and fully mastered. In other words, the difficulty in human society is a result of our unawareness." Machinery of a radio may be very complex for us because we do not know about them but the same may be not at all difficult for a radio-mechanic because he has complete information about them. The same thing can be said for social phenomena as well. For solving such complexities, scientists have devised two ways—firstly to minimize the problems in a situation and second to devise newer techniques for studying the greater numerical facts. The maturity of any science can be done on the basis of this that how much successful it has been in adopting the above two methods. The secret behind the great success in physical science is due to the fact that physical scientists have been satisfied studying the

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small yet interrelated problems whereas the social scientists have not freed themselves from doing detailed study of the limited problems by historical methods of philosophy.

## 14.2 Subjectivity and Intangibility of Social Phenomena

The most described difference between the physical and social phenomena and facts is that we can sense the physical phenomena with our senses whereas it is not possible to inspect many social phenomena because they are intangible. For example, let us take complete social relations. Social relations are intangible. We cannot see or touch them. They cannot be tasted or smelled. Human emotions, thoughts, values, principles, traditions, biasness, love are all subjective and intangible therefore these can only be explained symbolically through words. The result of this symbolization and intangibility is that there is no definite objective form of social phenomena because of which people view them in their own view point and therefore, no objectivity and neutrality can be developed in them which is utmost essential for a scientific study.

The study of social phenomena is a form of study in which a person studies the behaviour of other person. Because of this objectivity cannot be developed in our work study. If we were to study any animal plant or any chemical product or heavenly body then there would be no affection with them and there would have been no biasness, hatred, preconception because these animals or plants are not our own or extrinsic that is why during their study we can be neutral, detached and unbiased and our study becomes objective. Opposite to this when we study human nature in the form of social phenomena then the humans are our own or extrinsic so it is obvious to have attachment with people who are our own and to have biasness, hatred and disliking towards people who are extrinsic. There is also a possibility of considering our own practise and traditions, values, religion, or family-social group to be considered superior. It is obvious to have an opposite's behaviour toward extrinsic people. In such circumstances in spite of scientific study being possible, it would not be practical. Charles Veered has written social researcher cannot remain neutral in social world because sociologist studies the practises, religion, family, institutions, and values of a society and is himself a part of this and therefore understand or view this in the light of his own view point.

These problems are true to some extent but this truth does not mean that the subjectivity and intangibility of social phenomena is a hindrance in scientific study. If these problems are considered hundred present true them this would mean that there should be different techniques to study both types of phenomena because the physical phenomena are tangible and objective, whereas social phenomena are subjective and intangible. But form physiological researches we come to know that no separate techniques are used to study of social or physical phenomena. For example, in both the types of phenomena we get information in with the help of language.

According to Lundberg remember ablepoint in this subject is that practice, tradition, thought, experience are all a form of observable human behaviour and like any other behaviour these can be studied through common techniques. It is true that to study different kinds of behaviour we need to use different techniques and instruments. For example, some behaviour can be viewed through human eyes, some are viewed through monitoring instruments and the behaviour of some is seen with the help of a thermometer or brain waves. The result of all this inspections are described and transmitted with the help of special words. This rule also applies to social phenomena.

In this subject some people raise a doubt that analysing oneself can be used as a scientific fact? The answer to this would be yes if the inspector describes and transmits the result of his inspection in such a language whose testing is possible. It is for this reason that when a doctor measures his own temperature with the help of a thermometer then nobody doubts him because it is possible to re-evaluate this. If a sociologist of also do this then there inspection can become scientific fact weather the topics of the study are practice, traditions, values, religion or their own thoughts or emotions. Lundberg has rightly said that when we developed the inspection techniques of subjective phenomena

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in such a way that it is possible to transmit the result and confirm them through re-examination, then such results would be an appropriate matter for scientific study.

*Notes* 'Objective' or 'subjective' these two words do not point to two different types of phenomenon, but they tell that how much we have been possible to develop our tools of inspection for describing the outcomes of our inspection.

Due to lack of suitable techniques any technique that is today objective may become subjective in the future. For example, before the invention of thermometer, the measurement of temperature was a subjective phenomenon but after the invention of thermometer, the measurement of temperature became an objective phenomena.

Therefore, we can say that the differences between the social science facts and physical science are not real in spite of being evident. We consider the facts of physical sciences as more evident and objective as compared to sociology not because they are underlying differences between them but because the techniques of natural sciences are more developed. In the words of Lundberg, "There are no underlying differences in the facts, the underdeveloped techniques and methodology and unawareness of our study are the problems that hinder the possibility of a practical science of society."

## 14.3 Qualitativeness of Social Phenomena

One difference between social and physical phenomena that is quite often quoted is that physical phenomena are quantitative whereas social phenomena are qualitative in nature. The qualitative nature of social phenomena becomes a hindrance in the study because social phenomena unlike physical phenomena cannot be measured in quantitative terms. Measurement, weight and quantitative description of phenomena is essential for empirical study. We can talk of cooperation, struggle, culturalization, religious enmity, biasness but cannot measure them in quantitative terms. For example, the love and cooperation between a husband and wife, the intimacy between two friends or the strained relations between two opposing parties can only be presented in a descriptive manner but to present them in quantitative terms is very difficult. The biggest drawback of social phenomena is that every person views them according to their own view-point and understands them accordingly. If we say that my home is big in area then the estimate that one person have about area may be completely different from another person's estimate and a third person's estimate may be something very different from the first two. Therefore, it becomes difficult to find about the reality.

*Notes* Although a sociologist has to face many difficulties yet it does not mean that scientific research is not possible.

The reality is that the difference between the quantitative and qualitative facts is unscientific. This is a result of developments occurring or not occurring in the techniques of study. If the techniques are not of advanced level then there would be no other way than to describe them in qualitative way but if the techniques are of advanced level then then quantitative analysis of such phenomena becomes possible. Therefore, the drawback is not of the phenomena but of the techniques. Therefore, if we describe any phenomena as 'hot', 'cold', 'red', 'yellow', etc. then different people will mean it

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differently. But a necessary thing for scientific description is that whatever is said should mean the same for all people—to fulfil this objective the need to develop advanced techniques is experienced. That is why the categories of 'hot' and 'cold' are measured with the help of a thermometer and the categories 'red' or 'yellow' are measured with the help of light waves. In this way sociologists now use various types of scales for measurement of qualitative phenomena. From this it is clear that with the help of suitable techniques it is possible to quantitatively describe any qualitative phenomena. However, quantitative is any certain scientific description it will always have an element of qualitative nature. Mitchell writes," Even the most quantitative nature scientists will also have a qualitative stand in it. Our area of thoughts will be more expanded than our measurements, the pre-conceptions that provide detailed description and generalization to our targets and to the first view of our problems will always be qualitative in nature. In reality the more we use practical and eligible dependent measurements the more will the qualitative work be strong, area and interesting." Quantitative but this statement does not mean that there is no praiseworthy thing of qualitative science. Opposite to this the practicality of any science depends on this fact that how much qualitatively can a study object be described. And also this is remembered able that especially in new sciences the qualitative nature or the qualitative view-point is obvious and there is no point in its criticism. Criticism would be correct when the scientists think that qualitative technique is the only one technique to study this and the only description possible is qualitative. He should continuously move towards qualitative technique and description of qualitative methods and qualitative procedures. The more and more development of this science depends upon this awareness and endeavour.

## Self Assessment

Fill in the blanks:

1. The reality is that the difference between the quantitative and qualitative _____ is unscientific.
2. If we describe any _____ as 'hot', 'cold', 'red', 'yellow', etc. then different people will mean it differently.
3. In reality the more we use practical and eligible dependent _____ the more will the qualitative work be strong, area and interesting.

## 14.4 Lack of Homogeneity

One speciality of social phenomena is that no two units is same. Because of this dissimilarity it is not possible to use this in practical form. But the sociologists who have done intense study of society claim that there are both similarities and differences in a society. For the establishment and management of society, likeness in the society is very necessary because social relations develop from likenesses and a society develops from social relations. For example, the relation between Ram and Shyam is intense then this is also certain that there would be some or the other similarity between them and based on this similarity there is so much intensity between their friendship. It may be that both are good players or are fond of cinema or are drinkers or gamblers. It cannot be that without any similarity between them they both are good friends. The same thing is valid for a particular sector of social phenomena. By doing careful study we can find out the similarities between various units of a social phenomenon. MacIver and Page has written, If we want to give true or real form to 'one world' then we will have to accept the fundamental similarity in the entire human race.

Also there is no fault of the differences in social life. If the human life had only similarities then our social life would also have been limited and constrained as the life of honeybees and ants. We cannot imagine such a society that is entirely social phenomena made of either ladies or gents or in which all are either farmers or workers or judges or engineers or teachers. Therefore, without getting

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involved in the similarities and dissimilarities of social phenomenon the scientists should try to find out such advanced techniques through which the study of the similarities and dissimilarities of social phenomenon can both be studied.

This fact would also be wrong that the scientific study of physical phenomenon is more practical because there is similarity in physical phenomenon. Thinking of complete similarity is in itself impractical. Moreover there cannot be even complete similarity between the two things made from a machine.

Therefore, the lack of similarity is obvious and its presence in any science is adverse for its scientific nature. In this way the problem of sociology is not different with any other science. Does a doctor also face the problem due to the lack of similarity? His two patients can never be same in all the ways. Then also by real test and examination a doctor treats his patients by scientific manner and based on the reaction of medicine changes his direction of treatment. Then also nobody can say that doctor is not a scientist and he does not use scientific techniques. Then based upon this only how can one call social phenomenon and the study techniques of sociologists as unscientific if they lack similarity?

*Did You Know?* Famous businessman Henry Ford has proved this truth in a very interesting way in his own biography. He has written, "Two cars from Ford company are same in every manner; in fact any art of one car can be put into other car but one can easily understand that the two cars are not same after driving them; their characteristics are different and any driver can differentiate them with their closed eyes."

## 14.5 Lack of Universality in Social Phenomena

It is said that from the view-point of scientific study one more drawback of social phenomena is that there is lack of universality in them, although universality is a noteworthy feature of physical phenomena. For example, the burning power of fire is universal, the destroying power of water, drying power of sunlight is universal but this feature is not evident in social phenomena. For example, the characteristic to behave in a controlled manner in a student, the characteristic to be a virtuous wife and the characteristic to be obedient in children is not universal. A dacoit may not be necessarily cruel or harsh, he may be kind also. It is not certain that one king is only a protector he may be a destroyer of higher category. The result of this is that whatever results are obtained in relation to social behaviour from a sociologist are not real or the things that are true for one society may prove wrong for other society. In other words, the predicated rules by him are not that universally true like in natural or physical sciences.

The scholars who put above allegations may wrongly perceive the meaning of scientific rules. Scientific rules are not those rules which are applicable in all conditions and places. In the same way it is difficult to imagine the existence of universality or absolute scientific rules. Scientific rules are always applicable under certain given conditions. We have already written this in the beginning of the chapter.

## 14.6 Dynamic Nature of Social Phenomena

One more noteworthy feature or drawback of social phenomena is that too much change is viewable. The rate of change in today's modern societies and in human or human-groups and in certain social circumstances is rapid. Due to this uncertainty, it is difficult to inspect and test and derive definite results in such social phenomena. Today we are studying a particular group with certain characteristics

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but it is not certain that it would remain the same after some time also. This thing can also be said true for a person's behaviour. A human continuously learns from his experiences, education and this changes his behaviour pattern. Not only this but any sudden incident may also change the living style of a person or society in one night. For example, a famous police officer who consumes 15-20 cups of tea in a day goes to Ayodhya where a religious saint asks him to give away one of his habit for the name of god and the police officer takes a shocking decision to leave his habit of drinking tea in front of all his relatives and wife. Everyone thought that it was possible for police officer to leave the world but not tea but now everyone thinks that a person who can leave tea can leave anything—what can be said about human brain! Therefore, now the close ones of that police officer advise him to go anywhere except Ayodhyaji because they fear that they don't know what he may leave when he again goes there. This thing is true for human society as well. A society that was till date a happy and united one may become the victim of a flood or an earthquake one night—the same society may turn to an heart touching pathetic society. Due to such changes it is difficult to use scientific study.

Superficially this point seems to have much weightage. But changes or alteration are also evident in physical and natural phenomena. But change does not mean that social phenomena continue to happen in unorganized, sudden and uncertain manner. It is difficult to imagine this in even in barbarian society what to imagine in a civilized society. By doing a little alert inspection we come to know that in spite of changes, there is certainty, and in social phenomena the scientific study of these is also possible in the same way as natural and physical phenomena.

## 14.7 Unpredictability of Social Phenomena

Experience or future view is a test of science. A scientific rule makes us realize that what will be the possible procedures of future. It is said that the nature of social phenomena is such that it is impossible to do its prediction. The characteristics of social phenomena such as complexity, qualitativeness, dissimilarity and variations lessen the power of prediction. John A. Madge has written that one point starting from Comp and Spencer till the present day scientists all agree is that it is difficult to predict the human behaviour as compared to physical and natural phenomena. Two opposite reasons have been told as reasons for this uncertainty of social phenomena-(1) according to some scholars human behaviour is itself not fully affected by the circumstances around itself, humans themselves have the capacity to think. Therefore, they do not behave the same in a particular manner in a particular situation. (2) According to other scholars human behaviour is not independent and is affected by special phenomena but these phenomena are themselves so complex and diverse that it is impossible to predict that how much and how they will affect human behaviour. This is the reason why human behaviour becomes uncertain and unfit for preconception. In the same way social phenomena unlike physical phenomena are rapidly changing and due to this any preconception relating to this becomes uncertain.

The psychological studies that have been conducted in the modern time reveals such blames as baseless. In reality the people who put such blames forget that the human behaviour and facts that have been selected for the scientific study are not individual behaviour but group behaviour and there is not much uncertainty, variation in group behaviour that we cannot do any prediction about them. Also we should not forget this that the power of future prediction does not mean that any preconception that has been made will hold true in all situations. Such capability is not even in physical sciences. A natural or physical science also cannot predict this accurately that when will it rain, when will an earthquake occur, when will a storm or lunar tide occur or when will a child-birth take place, will it be a girl or a boy and at the starting of a cure of a disease doctor cannot tell whether the patient will die. Whatever he is saying may be true but it may be false also. In other words in his future prediction always an element of probability will reside and whatever he says will hold true or false will depend upon certain conditions. Today's water will remain as water tomorrow will prove to be true only if tomorrow is not much cold or hot. If it is too cold then water will turn to ice and if it is too hot then it will turn to water vapour.

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*Did You Know?* In all science there is an underlying condition,"Other conditions/things remaining same" is always present and should be.

In reality the power to predict the future does not depend upon the nature of subject of scientific study but on how successful it has been to develop the skilled techniques. If sociology is less capable of predicting future as compared to physical sciences then the reason for this is not the underlying weaknesses of social phenomena. In reality the lack of good techniques and processes is the responsible for such in capabilities. But attempts are being made in this direction and therefore we should be hopeful of the future. The day is not very far away when it will be possible to do certain future predictions about social phenomena. This is our prediction.

*Task* Why cannot the social phenomena be predicted?

## 14.8 Summary

- There are many issues of complexity of techniques in social research like complexity of social phenomenon, subjectivity and intangibility of social phenomena, qualitativeness of social phenomena, lack of homogeneity, etc.
- The characteristics of social phenomena such as complexity, qualitativeness, dissimilarity and variations lessen the power of prediction.

## 14.9 Keywords

1. **Subjectivity:** The self-conscious perspective or view-point of any person is said to be subjectivity.
2. **Universe:** From the view point of research, the entire units of study are termed as universe.

## 14.10 Review Questions

1. What are the methodological problems and difficulties in social research? Describe briefly.
2. What do you mean from the complexity of social phenomena?

## Answers: Self Assessment

1. Facts
2. Phenomena
3. Measurements.

## 14.11 Further Readings

*Books*

1. Sociology of Education-Tiwari Sharda, Arjun Publishing House.
2. Techniques of Behavioural Research-Dr. Jai Bhagwaan, Friends Publication (India).

# Unit-15: Validity and Reliability in Qualitative Research

Notes

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## Objectives

After studying this unit students will be able to:

- Situation of validity in Qualitative research
- Situation of reliability in Qualitative research.

## Introduction

Sometime based on our earlier knowledge and experience, we do something else instead of what actually we should have done. Because of this there arises invalidity in research. Sometime researcher behave in a biased manner, due to this there arises a problem of validity and reliability in the study.

## 15.1 Subject-Matter

In qualitative research such as inspection the situation of validity and reliability is not much stringent because such problems are associated with the study of social incidents-

1. **Observation Plan—** To make inspection more valid the researcher should first prepare a plan for inspection and thereafter start the inspection work. The researcher should decide all the points in his inspection plan, for example, which facts need to be inspected and by what technique. Also, the incident should be divided into various aspects and their study must be conducted by experiment proof technique. If inspection is conducted in such a way then indeed it will be more fruitful.

2**. Use of Schedules—** If the researcher uses sources such as schedules for conducting inspection then the inspection would be more valid and reliable. For inspection work the schedule used is different from the ordinary schedule. In this schedules there is an empty table. The inspector fills the information in this table. In this schedule only one thing needs to be kept in mind that the inspection plan should be such that it is capable of gathering the complete information of the related topic. That is why the information collected is fully classified and the various tables are made such that it is easy to analyse the information collected before and after.

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*Notes* Where most of the workers are involved in research work, there it is necessary to use schedule for making inspection subjective.

3**. Formulation of Hypothesis—** In reality the formulation of hypothesis helps to systematically carry out inspection because the research become specific and focused. Researcher does not wander.if ever a definite hypothesis cannot be formulated due to some reason then a definite problem and a definite area of study must be necessarily selected because it adds certainty to the study.

4. **Use of Scientific Tools—** By use of different scientific tools the inspection becomes more valid and reliable. Photo film, tape recorder, cinema etc. are such instruments which are used to avoid biasness. Along with this it also helps to point out any fault of the inspector.

*Did You Know?* In this there is one drawback that if the people come to know that their behaviour and works are being filmed (recorded) than there comes an artificiality in their nature. Due to this the results can be erroneous.

**5. Use of Socio-metric Scales—** Now-a-days in social research socio-metric scales are also used, due to which there is greater possibility of results being more true and accurate. In these scales the different type of qualitative social facts are measured accurately so that there is no scope of any biasness of the inspector.

**6. Mass Observation—** In mass observation there is a greater possibility of inspection being valid and reliable because in this inspection is done through experts from various fields. Therefore, there are less errors.

## Self Assessment

Fill in the blanks:

1. To make inspection more _____ the researcher should first prepare a plan for inspection and thereafter start the inspection work.
2. The _____ use of sources such as schedules for conducting inspection then the inspection would be more valid and reliable.
3. In reality the formulation of _____ helps to systematically carry out inspection.

## 15.2 Summary

- In qualitative research, the researcher should first prepare a plan for inspection and thereafter start the inspection work.
- To make this more reliable socio-metric scales are used.

## 15.3 Keywords

1. **Mass Observation—** In this many people study the same incidents together.

## 15.4 Review Questions

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1. Explain the importance of validity and reliability in qualitative research.
2. What are scientific instruments? Describe briefly.

## Answers: Self Assessment

1. Valid 2. Researcher 3. Hypothesis.

## 15.5 Further Readings

*Books*

1. Social Survey and Research—VandanaVohra, Radha Publication.
2. Fundamentals of Sociology—Dr. Ganesh Pandey, Arunpandey, Radha Publication.

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# Unit-16: Methods: Meaning and Characteristics of Statistical Method

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## Objectives

After studying this unit students will be able to:

- The use of statistical method in sociology
- The meaning and characteristics of statistical method.

## Introduction

Methodology means a system that a scientist uses for his study to derive factual results. There is no short-cut to derive factual result. For this one has to adopt the difficult task of inspection, classification, experiment, comparison and findings. The study system comprising of all these is termed as scientific methods. This system and methods is same in all sciences because the basic function of all sciences is to derive factual results and to formulate principal based on them and for doing so it needs to follow the difficult path of inspection, classification, experiment and comparison. According to Wolfe, "Any research system through which a science has originated and developed is fit to be called scientific methodology."

## 16.1 Subject-Matter: Meaning and Characteristics of Statistical Method

In the present time statistical method is used quite often in sociology. In sociology this technique is used to present social facts in resultant or numerical form. Due to the use of this technique many people now consider sociology as a practical science. It is a mathematical form to present social incidents and facts.

*Did You Know?* Firstly Gidinks used this method to study the problems associated with numerical aspects in society.

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Explaining the meaning of statistical methods Saligman writes, "Statistic is that science that is associated with compilation, presentation, comparison and interpretation of numerical facts that have been gathered to throw light on any particular area."

*Notes* According to Lavit, "Statistics is the science that based on the description and comparison of incidents presents the compilation, classification and tabulation of numerical data."

Robertson writes, "Statisticsis is a device or source that can be used to attack the problems and find solutions for problems arising in any area of experimental research." Kendal has said that statistics is that branch of scientific methodology that is related with the matter collected from the measurement and calculation of specialities of various groups of substances. From the above definitions it is clear that statistics is that method in which facts are presented in a numerical form to provide meaningful result.

In sociology it is essential to present various incidents in qualitative as well as quantitative manner. For example, the size and design of population, family dissolution, rate of divorce, the incidents of crime or child crime, the increase or decrease in joint families, the population of village and cities, literacy rate, the trends towards industrialization and urbanization can be done easily with the help of statistics. The results obtained from such studies can be presented in numerical, average or percentage format. This methodology has proved useful in numerical description of social facts of qualitative nature.

If we pay attention to statistics methodology then we will find out that in this firstly samples are selected from a universe. Than with the help of a questioner or schedule technique various facts are gathered. Various precautions must be taken at the time of compilation of facts so that accurate information can be recorded. Thereafter the gathered facts are classified and tabulated. Here the causal relationships are described in a numerical or percentage form. After that with the help of various averages the frequencies are made easy and are presented in the form of graphs and charts. The results obtained from this method are more valid and clear.The results obtained from statistics methods are useful to understand the various social problems such as unemployment, poverty, crime, child crime etc. in this method there is very less possibility of biasness. This technique has proved useful to throw light on various problems.

The biggest drawback is that through this method the social incidents can only be presented in numerical or quantitative format but not in qualitative format. If in the present time we want to study the changes in the values and mentalities of people then this method will not be useful. This method will also not be of much use if we want to understand the causal relationship between various social incidents of problems. For this we need to use the qualitative method. In spite of these limitations, as this technique is based on math it is considered a scientific technique and its use in sociology is continuously increasing.

## Self Assessment

Fill in the blanks:

1. _____ is a device or source that can be used to attack the problems and find solutions for problems arising in any area of experimental research.
2. In sociology it is essential to present various incidents in qualitative as well as _____ manner.

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3. If we pay attention to statistics methodology then we will find out that in this firstly samples are selected from a _____ .

## 16.2 Summary

- In sociology this technique is used to present social facts in resultant or numerical form.
- The results obtained from such studies can be presented in numerical, average or percentage format.
- The main goal of statistics methods is to present large facts in a brief manner to make them easily understandable and present generalization based on that.

## 16.3 Keywords

1. **Statistics:** Statistics is the group of techniques used for compilation, classification, tabulation, interpretation and analysis of numerical facts.

## 16.4 Review Questions

1. What is the meaning of statistics?
2. What is the use of statistics method in sociology?

## Answers: Self Assessment

1. Statistics 2. Quantitative 3. Universe.

## 16.5 Further Readings

*Books*

1. Methodologies of social Research—Sanjeev Mahajan, Arjun Publishing House.

2. Classical Social Contemplation—Agarwal Gopal Krishan, Bhatt Brothers.

# Unit-17: Measures of Central Tendency: Mean, Median, Mode

Note

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## Objectives

After studying this unit students will be able to:

- Summarize the complex series and series of digits.
- Analyze large groups through summarised pictures.
- Easily compare large numbers.
- Guess the relation or ratio found between two or more series or groups.

## Introduction

During social investigation, whatever statistical data are accumulated, through them, any inference cannot be drawn. Because of this, classification or tabulation of that data is essential. Even after that, to make them more easy and understandable, help of diagrams and graphs is taken. But, how successful will be the study of facts through diagrams and graphs, it depends on the view of the investigator, which is a subjective factor. That is why, from the series of facts, we essentially need to find out one such digit which may appropriately represent that series. Through it, comparative study becomes

**Note**

easy. Those values which tell us the character of the group in a brief form in one digit itself are known as measures of central tendency. In statistics, these values are known as average. In this unit, we will describe it only.

## 17.1 Measures of General Tendencies

Whatever statistical data are collected during social researcher, through them any inference cannot be drawn. Because of this classification or tabulation of those data is essential. After this also, to make them easy and understandable, help of diagrams and graphs is taken. But study of data through diagrams and graphs will be accurate or not, depends on the practicality of view of the investigator. But view, as we know is an uncertain factor. That is why study done and inferences drawn with the help of it may be unreliable. Other than this, even after classifying and tabulating the data and figures, it is possible to present them in more summarized manner. If from a series of data we get to know one such figure or number that may appropriately represent that series, then doing a comparative study of various series will become really easy for us. It is accepted that though the data that is received by the investigator, their values are different, still from all the data, one such "character "value may be found which can appropriately represent all personal numbers. Such character or value is only known as central tendency. Central tendency does not throw light on character or value of separate data or facts but it represents the entire class or series and in this way it points towards the tendency or value of entire group. For example, in an example, if any five students have received 7, 9, 5, 6 and 8 marks respectively, apparently it will be said that the capability of the five students is different from each other. But by looking at these numbers it is known that 7 is the number around which other numbers are situated. Two numbers are smaller than 7 and two are bigger than 7. Hence, it may be said that 7 is the number that represents this entire group. That is why, though the capability of students representing this group is different from each other, still collectively their capability will be considered 7 only because this value is located in the centre of all the values and other values are inclined towards this central value 7. That is why we will call 7, the central tendency of above-mentioned marks received.

*Notes* We can say that values that briefly tell us the character of the group in one number itself are known as measures of central tendency. In statistics, these values are known as average.

## 17.2 Statistical Average

**Meaning of Average**

As per Ghosh and Chaudhary "average is one such easy expression on which actual result or summary of complex group or large numbers is centred."

As per the view of Elhance, "it is clear that such value which is used to represent complete series, that neither has the least value in the series, nor the maximum value, instead it is a value that comes in between these two limits and possibly situation is that centre where most units of the series get collected. Such numbers are known as the measures of centre tendency or average."

From the above-mentioned definitions it is clear that average is a number that represents complete series and manifests the central value which is situated in the centre of the maximum and minimum value of those series. In this manner, by looking at the average, to find out the central point or value

of the entire series, becomes easy for us. In this meaning, average becomes a medium for briefing the large numbers.

Note

## Utility and Objectives of Averages

In social research, in description, analysis and in finding inference of data use of averages is notable. From the below mentioned description, utility and objective of averages will become further clear.

1. The foremost objective of averages is to summarize the complex series and numbers. Through average, a summarized form can be provided to the spread facts of various qualities. Nothing can be known from a heap of numbers but average being one number only, manifests the central point or value of the heaps of numbers.
2. One more objective or utility of averages is that through it, comparison of data becomes very easy. Comparison of series with many numbers is very difficult but if they are provided the form of one number then the job of comparison itself becomes easy. Actually averages are taken out with an objective to compare complex and large numbers only.
3. As per Ghosh and Chaudhary have written that a brief diagram of a large group is presented so that job of analysis becomes easy for us. The fact is that by presenting a summarized form of a large group and making the job of comparison and description easy is a notable objective of average.
4. Through averages, presumption is made about the relationship or ratio found between two or more groups of series of numbers. For scientific analysis or description, knowledge of such relations or ratios is important. Averages help us in this job. One more utility of objectives is that they may prove helpful in summarizing our study work. Study of collective units of a community is not possible for us and because of this through sampling-method we collect the facts related to few units. In order to further summarize these data, we use averages. In this manner, with the help of sample data averages are helpful in presenting the diagram of entire groups.
5. One more use of averages is that it helps to brief our study work. It is difficult for us to analyse the overall units of a population and therefore we collect some related facts from the units through sampling method. Averages can be used to further brief these facts. In this way with the help of sample facts averages are useful in presenting the picture of entire population.

*Task* What is called as statistical average? Describe in detail.

## 17.3 Types of Averages

Ghosh and Chaudhary have described the following types of averages:

I. Average of Position

1. Mode
2. Median

II. Mathematical Averages

1. Arithmetic average and mean
2. Geometric mean

Note

3. Harmonic mean
4. Quadratic mean

III. Other of Business Averages

1. Moving average
2. Progressive average

From the above given averages we will only discuss those that have a use in the analysis and description of the facts related to social research.

## Arithmetic Average or Mean

According to Ghosh and Chaudhary, "Arithmetic average which is also called as mean is that result that is obtained by dividing the sum of values of a variable by its number."

From the above definition it is clear that arithmetic average is actually finding out the mean which the students were taught in their lower classes. If we know the value of all units separately then to find the arithmetic average or mean we need to add them together and divide them with number of units. The result obtained from this is called as arithmetic average or mean. Thus it is clear that arithmetic average has following characteristics—

a. Arithmetic mean is obtained by dividing the sum of values of a variable by the number of variables.
b. In this entire elements are used i.e. all elements are given equal importance. Neither element is neglected or given more importance. An element is counted only once.
c. If we know the value of arithmetic average and elements then we can find out the real value of sum of elements. Similarly, we can also find out the number of elements.
d. Arithmetic average does not depend upon the frequencies but depends on the value of all elements.

## Method of Calculating Mean

Arithmetic average can be calculated using two techniques—(a) Direct Method and (b) Short-cut method. Now we will discuss the two techniques one by one here.

## Calculation of Mean in Simple Series

**(a) Direct Method—** In this method firstly all the values of elements are added together. Then it is divided by the number of elements. The result obtained is arithmetic average. It can be demonstrated by following example.

*Example* 1 Given below is the description of the height of 10 students. Calculate their arithmetic average with the help of direct method.

Height (in cms)—155, 153, 168, 160, 162, 166, 164, 180, 157, and 165.

**Solution:** on the basis of above given heights the methodology to calculate arithmetic average by direct method will be like this:

Sum of heights $6 \times \sum x = 155 + 153 + 168 + 160 + 162 + 166 + 164 + 180 + 157+165$

**Note**

$= 1630$

$\therefore \quad 6 \times \sum x = 1630$

Number of students ($n$) $= 10$

Formula of arithmetic average (M) $= \dfrac{6 \times \sum x}{n}$

$$M = \frac{6 \times \sum x}{n} = \frac{1630}{10} = 163$$

Therefore, arithmetic mean (M) = 163 cm

**(b) Short-cut Method—** If the series is long and its values are different then it is difficult to find the sum by direct method for calculating arithmetic average. Therefore, to reduce the effort and time short-cut method is used. In this method any value is considered as mean, then deviation of every value from this given supposed mean is calculated. In other words the difference between the imagined mean and the values of elements is calculated separately. If the value of an element is less than the imagined mean it is denoted by a negative sign (–) but if the value of an element is more than the imagined mean it is denoted by a positive sign (+). In this way the deviation or difference of every element is calculated then the sum of all the deviations is divided by the number of elements and the value obtained from this is added to the supposed mean, this is real mean. This method can be demonstrated with the help of given below example.

*Example* 2 Calculate the arithmetic average of 10 students given in example 1 with the help of short-cutmethod.

**Solution:** To calculate the arithmetic average with the help of short-cut method firstly we have to select any height as supposed mean and then we need to calculate the deviation of all height from this supposed mean, as shown in the table below in which 160 is the assumed mean.

**Table 17.1**
**Calculation of arithmetic average with the help of short-cut method**

| Height ($x$) | Deviation from assumed mean 160 *(d)* |
|---|---|
| 155 | (155–160) = – 5 |
| 153 | (153–160) = – 7 |
| 168 | (168–160) = + 8 |
| 160 A | (160–160) = 0 |
| 162 | (162–160) = + 2 |
| 166 | (166–160) = + 6 |
| 164 | (164–160) = + 4 |
| 180 | (180–160) = + 20 |
| 157 | (157–160) = –3 |
| 165 | (165–160) = + 5 |
| **$n$ = 10** | **$\Sigma$d = (45 – 15) = 30** |

**Note**

Formula of calculation of arithmetic average (M) by short-cut method—

$$M = A + \frac{\Sigma d}{n}$$

Here assumed mean $A = 160$

$\Sigma d = 30$

$n = 10$ (because there are 10 students)

$$M = 160 + \frac{30}{10}$$

$= 160 + 3 = 163$

Therefore, the arithmetic average of 10 students = 163 cms

*Notes* Here one thing should be noticed that the solution obtained from the direct method and the short-cut method should be same as in example 1 and 2.

## Self Assessment

Fill in the blanks:

1. The calculation of arithmetic average is in reality _____that is taught to students in lower classes.
2. The result obtained by dividing is known as _____
3. If we know the _____ and number of elements then we can find out the real sum.

## 17.4 Calculation of Mean in Discrete Series

**(a) Direct Method–**Arithmetic average is calculated in the condition when the elements are in distinct categories. In such a situation the technique to calculate the mean has following stages-

*(i)* Multiply each frequency with its value.

*(ii)* This way calculate the sum of all multiplications

*(iii)* Divide this from the sum of frequencies

*(iv)* The result obtained is called as mean.

This technique can be demonstrated with the help of a formula using various symbols:

If we assume that-

Value of an element = $x$

Frequency = $f$

Value of an element × frequency = $fx$

Sum of frequency = $\sum f$

Sum of (Value of an element × frequency) = $\sum fx$

Then according to above method-

$$M = \sum fx / \sum f$$

$$\text{Therefore mean } (M) = \frac{\text{Sum of (Value of an element} \times \text{frequency)}}{\text{Sum of frequency}}$$

Note

*Example 3* In some families the number of children per family is given below. Calculate the arithmetic average of children per family by direct method.

| Number of children per family | Number of families |
|---|---|
| 0 | 96 |
| 1 | 108 |
| 2 | 154 |
| 3 | 126 |
| 4 | 95 |
| 5 | 62 |
| 6 | 45 |
| 7 | 20 |
| 8 | 11 |
| 9 | 6 |
| 10 | 5 |
| 11 | 5 |
| 12 | 1 |
| 13 | 1 |

**Solution:** To calculate the arithmetic average using direct method, we need to calculate the sum of the multiplication of value of elements and their related frequencies (Number of families) and the sum of frequencies, as shown in the table given below

**Table 17.2**
**Calculation of arithmetic average of number of children born in every family using direct method**

| Number of children born in each family ($x$) | Frequency ($f$) | $fx$ |
|---|---|---|
| 0 | 96 | (0 × 96) = 0 |
| 1 | 108 | (1 × 108) = 108 |
| 2 | 154 | (2 × 154) = 308 |
| 3 | 126 | (3 × 126) = 378 |
| 4 | 95 | (4 × 95) = 380 |
| 5 | 62 | (5 × 62) = 310 |
| 6 | 45 | (6 × 45) = 270 |
| 7 | 20 | (7 × 20) = 140 |
| 8 | 11 | (8 × 11) = 88 |
| 9 | 6 | (9 × 6) = 54 |
| 10 | 5 | (10 × 5) = 50 |
| 11 | 5 | (11 × 5) = 55 |
| 12 | 1 | (12 × 1) = 12 |
| 13 | 1 | (13 × 1) = 13 |
| Total | $\Sigma f = 735$ | $\Sigma fx = 2166$ |

**Note**

$$\text{Formula of arithmetic average} = \frac{\Sigma fx}{f}$$

$$\text{Number of families } (\sum f) = 735$$

$$\text{Sum of number of children in each family } (\sum fx) = 2166$$

$$\therefore \quad M = \frac{\Sigma fx}{\Sigma f}$$

$$= 2166/735 = 2.9 \text{ or } 3 \text{ children}$$

Therefore, arithmetic average of number of children born in every family= 3 children.

**(b) Short-cut Method-** There are following stages to calculate the arithmetic average using short-cut method-

*(i)* Firstly we assume any element as the assumed mean in a discrete series and thereafter calculate the deviation of values of elements from that assumed mean.

*(ii)* Thereafter the we multiply each frequency with its related deviation and find its sum.

*(iii)* In this way after dividing the above sum from the sum of frequencies, we get the result. To this result we add the assumed mean.

*(iv)* This sum is the arithmetic average.

If assumed mean is $A$, sum of frequencies is $n$, and the sum of deviations ($d$) is assumed as $\sum fd$ then the above method can be written as a formula in this way-

$$M = A + \frac{\Sigma fx}{n}$$

If the symbol $n$ for sum of frequencies is replaced by $\sum f$ then the formula would be like this

$$M = A + \frac{\Sigma fd}{\Sigma f}$$

In order words,

$$\text{Mean} = \text{Assumed mean} + \frac{\text{Sum of the multiplication of deviations and frequencies}}{\text{Sum of frequencies}}$$

*Example 4* Calculate the arithmetic average of the number of children born in each family as given in example 3 using short-cut method.

**Solution: Calculation of the arithmetic average of the number of children born in each family using short-cut method.**

| Number of children born in each family ($x$) | Number of families ($f$) | Deviation ($d$) from assumed mean (A = 6) | Total deviation ($f$, $d$) |
|---|---|---|---|
| 0 | 96 | (0 – 6) = – 6 | (96 × – 6) = – 576 |
| 1 | 108 | (1 – 6) = – 5 | (108 × – 5) = – 540 |
| 2 | 154 | (2 – 6) = – 4 | (154 × – 4) = – 616 |
| 3 | 126 | (3 – 6) = – 3 | (126 × – 3) = – 378 |
| 4 | 95 | (4 – 6) = – 2 | (95 × – 2) = – 190 |
| 5 | 62 | (5 – 6) = – 1 | (62 × – 1) = – 62 |
| 6 (A) | 45 | (6 – 6) = – 0 | (45 × 0) = 0 |

Note

| | | | |
|---|---|---|---|
| 7 | 20 | (7 – 6) = +1 | (20 × 1) = 20 |
| 8 | 11 | (8 – 6) = +2 | (11 × 2) = 22 |
| 9 | 6 | (9 – 6) = +3 | (6 × 3) = 18 |
| 10 | 5 | (10 – 6) = +4 | (5 × 4) = 20 |
| 11 | 5 | (11 – 6) = +5 | (5 × 5) = 25 |
| 12 | 1 | (12 – 6) = +6 | (1 × 6) = 6 |
| 13 | 1 | (13 – 6) = +7 | (1 × 7) = 7 |
| **Total** | **$\Sigma f$ = 735** | | **$\Sigma fd$ = (– 2362 + 118) = – 2244** |

Formula for calculation of arithmetic average using short-cut method

$$M = A + \frac{\Sigma fd}{\Sigma f}$$

Here assumed mean $A = 6$

$\sum fd = -2244$

$\sum f = 735$ (Number of families)

Therefore, $M = 6 + \frac{-2244}{735}$

$= 6 - 3.05$

$= 2.94$ or 3 children.

Therefore, the arithmetic average of number of children born in each family = 3 children

*Task* How do we calculate arithmetic average in a discrete series? Describe.

## 17.5 Calculation of Mean in Continuous Series

If the frequency of class intervals is given then we can calculate the mean using two techniques— one is direct method and the other is short-cut method. Here both the techniques are described separately.

**(a) Direct-method—** The mean for continuous series is calculated using direct method in the same way.

*Did You Know?* Direct method is used for calculation of mean in continuous series. In this only one stage is extra that in this method we find the mean of class intervals and in this way we convert the continuous series into discrete series.

In this way we can present the direct method in this way-

**Note**

*(i)* Calculate the mean of each class-interval. This mean is equal to the half of sum of upper and lower limits of class-interval. If the class-interval is 10 – 15 then the mean will be $\frac{10+15}{2} = 12.5$ .

*(ii)* Multiply the frequency of each class interval ($f$) with its mean ($x$) and calculate its sum ($fx$)

*(iii)* Thereafter calculate the sum of multiplication of frequency and their mean ($\sum fx$) and the sum of frequencies ($\sum f$) or $n$.

*(iv)* Find the result of the division of ($\sum fx$) and ($\sum f$) or ($\sum n$).

*(v)* This result will be the mean.

Therefore, the formula for direct method will be-

Mean $$M = \frac{\Sigma fd}{\Sigma n}$$

If we use ($\sum f$) in place of $n$ then our formula will be –

$$M = \frac{\Sigma fx}{\Sigma n}$$

Mean can be calculated using any of the above given formulae. The result will be same for both methods.

*Example* 5 The frequency for the weekly wages of 65 workers in Bharat Electronics Ltd. is given in the table below. Calculate the arithmetic average by direct method.

| Wages (in ₹) | Number of workers |
|---|---|
| 50–60 | 8 |
| 60–70 | 10 |
| 70–80 | 16 |
| 80–90 | 14 |
| 90–100 | 10 |
| 100–110 | 5 |
| 110–120 | 2 |

**Solution:** To find arithmetic average by direct method firstly we need to find out mean ($x$) and based on that we find out $fx$, $\sum fx$ and $\sum f$ or $n$. This work will be possible by working on the following table like this-

**Table 17.3**

| Wages (in ₹) | Number of workers ($f$) | Mean of class-intervals of wages ($x$) | Multiplication of mean of class-interval of wages and numbers of workers ($fx$) |
|---|---|---|---|
| 50–60 | 8 | $\left(\frac{50+60}{2}\right) = 55$ | $(8 \times 55) = 440$ |
| 60–70 | 10 | $\left(\frac{60+70}{2}\right) = 65$ | $(10 \times 65) = 650$ |

Note

| | | | |
|---|---|---|---|
| 70–80 | 16 | $\left(\frac{70+80}{2}\right) = 75$ | $(16 \times 75) = 1200$ |
| 80–90 | 14 | $\left(\frac{80+90}{2}\right) = 85$ | $(14 \times 85) = 1190$ |
| 90–100 | 10 | $\left(\frac{90+100}{2}\right) = 95$ | $(10 \times 95) = 950$ |
| 100–110 | 5 | $\left(\frac{100+110}{2}\right) = 105$ | $(5 \times 105) = 525$ |
| 110–120 | 2 | $\left(\frac{110+120}{2}\right) = 115$ | $(2 \times 115) = 230$ |
| **Sum** | $\Sigma f$ **means** $n$ **= 65** | | $\Sigma fx$ **= 5185** |

The formula for direct method ($M$)—

$$M = \frac{\Sigma fx}{\Sigma n} \text{ or } M = \frac{\Sigma fx}{\Sigma n}$$

$$= \frac{5185}{66}$$

$$= 79.77$$

Therefore, the average weekly wages = ₹ 79.77

**Short-cut Method or Step Deviation Method—** This short cut method is same as the short-cut used for calculating the arithmetic average of discrete series, in this only the mean of class-intervals is calculated.

Therefore, we can present this short-cut method as-

*(i)* Find the mean ($x$) of class-intervals. This mean will be equal to the half of the sum of higher and lower limits of a class.

*(ii)* Assume the mean of any class-interval as assumed mean ($A$). But in doing so firstly remember two things—first that assumed mean must be the mean of that class-interval whose frequency is highest and second that assumed mean must be the mean of that class-interval which is mean of given class-intervals.

*(iii)* Find the difference ($x - A$)of the mean ($x$) of class-intervals and the assumed mean ($A$). In other words calculate the difference ($d$) from the assumed mean of the mean of class intervals.

*(iv)* Thereafter find the sum ($\sum fd$) of the multiplication ($fd$) of the frequency ($f$) with its related deviation ($d$).

*(v)* Find the result of the division of (($\sum fd$) and ($\sum fn$) or add this result to the assumed mean ($A$).

*(vi)* This result will be arithmetic average.

If we present this technique in a formula this will be like-

$$M = A + \frac{\Sigma fd}{N}, \text{ or } A + \frac{\Sigma f d}{\Sigma f}$$

**Note**

*Example* 6 Keeping in mind example 5, find the arithmetic average by short-cut method.

**Solution:** To solve this question by above technique we need to present this table as follows-

**Table 17.4**

| Wages (in ₹) | Number of workers (*f*) | Mean of class intervals of wages (*x*) | Deviation of mean (*x*) from assumed mean (*A* = 75) (*x* – *A* = *d*) | Multiplication of deviation and numbers of workers (*fd*) |
|---|---|---|---|---|
| 50–60 | 8 | $\left(\frac{50+60}{2}\right)$ = 55 | (55 – 75) = – 20 | 8 × –20 = –160 |
| 60–70 | 10 | $\left(\frac{60+70}{2}\right)$ = 65 | (65 – 75) = – 10 | 10 × –10 = –100 |
| 70–80 | 16 | $\left(\frac{70+80}{2}\right)$ = 75A | (75 – 75) = + 0 | 16 × 0 = 0 |
| 80–90 | 14 | $\left(\frac{80+90}{2}\right)$ = 85 | (85 – 75) = + 10 | 14 × 10 = + 140 |
| 90–100 | 10 | $\left(\frac{90+100}{2}\right)$ = 95 | (95 – 75) = + 20 | 10 × 20 = + 200 |
| 100–110 | 5 | $\left(\frac{100+110}{2}\right)$ = 105 | (105 – 75) = + 30 | 5 × 30 = + 150 |
| 110–120 | 2 | $\left(\frac{110+120}{2}\right)$ = 115 | (115 – 75) = + 40 | 2 × 40 = + 80 |
| | Σ means | | | Σ *fd* = (+ 570 – 260) = 310 |
| | *n* = 65 | | | |

Formula for calculating arithmetic average using short-cut method or step deviation method

$$M = A + \frac{\Sigma f d}{\Sigma f} \text{ or } A + \frac{\Sigma f d}{\Sigma n}$$

Here assumed mean $A = 75$

$$\Sigma f d = +310$$

$\Sigma f$ or $n = 65$ (Number of workers)

$\therefore$

$$M = 75 + \frac{310}{65}$$

$$= 75 + 4.77$$

$$= 79.77$$

Therefore, average weekly wages = ₹ 79.77.

Note

*Example 7* Calculate the arithmetic average using short-cut method for the data given below for the production of crop.

| Production | 0.5 – 4.5 | 4.5 – 8.5 | 8.5 – 12.5 | 12.5 – 16.5 | 16.5 – 20.5 | 20.5 – 24.5 |
|---|---|---|---|---|---|---|
| Number of farms | 4 | 8 | 5 | 10 | 8 | 9 |

**Solution:** We need to prepare the given below table to solve the above question using the facts given:

**Table 17.5**

| Production | Number of farms (*f*) | Mean of production class–intervals (*x*) | Deviation (A=10.5) of mean from (x–A)=d | Multiplication of deviation and numbers of farms (*fd*) |
|---|---|---|---|---|
| 0.5–4.5 | 4 | $\left(\frac{0.5+4.5}{2}\right)=2.5$ | (2.5–10.5) = – 8 | (8 × – 4) = – 32 |
| 4.5–8.5 | 8 | $\left(\frac{4.5+8.5}{2}\right)=6.5$ | (6.5–10.5) = – 4 | (8 × – 4) = – 32 |
| 8.5–12.5 | 5 | $\left(\frac{8.5+12.5}{2}\right)=10.5$ | (10.5–10.5) = 0 | (5 × 0) = 0 |
| 12.5–16.5 | 10 | $\left(\frac{12.5+16.5}{2}\right)=14.5$ | (14.5–10.5) = + 4 | (10 × 4) = + 40 |
| 16.5–20.5 | 8 | $\left(\frac{16.5+20.5}{2}\right)=18.5$ | (18.5–10.5) = + 8 | (8 × 8) = + 64 |
| 20.5–24.5 | 9 | $\left(\frac{20.5+24.5}{2}\right)=22.5$ | (22.5–10.5) = + 12 | (9 × 12) = + 108 |
| | $\Sigma f$ means = + 148 | | $\Sigma fd$ = (212–64) | $n$ = 44 |

Formula for calculating arithmetic average using short-cut method or step deviation method—

$$M = A + \frac{\Sigma f d}{\Sigma f} \text{ or } A + \frac{\Sigma f d}{\Sigma n}$$

Here assumed mean ($A$)= 10.5

$$\Sigma fd = + 148$$

$$\Sigma f \text{ or } n = 44 \text{ (number of farms)}$$

$$M = 10.5 + \frac{148}{44} = 10.5 + \frac{37}{11} = 10.5 + 3.36$$

$$= 13.86$$

Note

## 17.6 Merits of Arithmetic Average or Mean

To find the mean everyone accepts the importance of arithmetic average because of its given below features-

1. Arithmetic average is clearly defined and therefore, no one doubts it.
2. It is very easy to calculate arithmetic average and therefore, no high-level maths knowledge is required for its calculation.
3. Because the technique of solving arithmetic average is very easy therefore more and more people can take advantage of this. Because by knowing normal maths they all can easily calculate mean.
4. There is no need to keep the series in a particular order for calculating arithmetic average. The numbers can be as it is used to calculate the mean. Because in this only addition, subtraction, etc. is used.
5. To calculate arithmetic average there is no need of the knowledge of every element in a series. Even if we know the value of the sum of the elements and the number of elements then we can find out the mean. Similarly if we know the arithmetic average of two or more than two series separately then we can find out the arithmetic average of the combined series.
6. In the arithmetic average, all small as well as big elements are given equal importance and every element is counted only once. Neither any element is neglected nor given more importance.
7. Arithmetic average is very useful for comparative study.

## 17.7 Demerits of Arithmetic Average

Besides above merits of arithmetic average there are some of its demerits also which are as follows:

a. It is also possible that arithmetic average presents some results which are impossible in real life, like the arithmetic average of number of people getting down on a certain station can be 200.45. But in reality, never 200.45 people can get down in any station. Similarly the number of children per mother can be 2.7 but in reality this is impossible because number of children can only be an whole number not 0.7.

*Notes* Once a famous comic book 'Panch' has written that a Royal Commission considered the figure of 2.2 children as very foolish and the reason for this was thought as the poor financial condition. Therefore, Royal Commission suggested that middle class people must be given some financial aid so that they can raise the number of children to a whole number and also increase them to a convenient number.

b. There is an ill effect of uncommon elements on the arithmetic average, especially when the elements are very big or very small. For example, if in a class certain student obtains 100 marks in maths and the remaining 6 students obtain 20, 25, 19, 24, 15 and 28 marks then the arithmetic average will be = 100 + 20 + 25 + 29 + 24 + 15 + 28 = 231 ÷ 7 = 33. But if we do not include the student who has obtained 100 marks then the arithmetic average will be = 20 + 25 + 19 + 24 + 15 + 28 = 131 ÷ 6 = 22. Therefore, it is evident that if there is a very big or very small element in the series then the arithmetic average does not present a true picture of the series.

Note

c. It is necessary to know the values of all the elements separately for calculating arithmetic average. If some of the elements are left out then mean cannot be calculated whereas median and mode can be determined.

d. Arithmetic average does not point out to progressive and regressive series and sometimes misguiding results are also obtained from this. For example, if a student obtains 381, 427 and 502 marks in three-monthly, six-monthly and yearly exams respectively and another student obtains 502, 427 and 381 marks respectively then the arithmetic average of the two will be same and it cannot be determined that the two were increasing. Similarly regressive series can also not be shown by this.

## 17.8 Median

Median is that point which divides a given series into two equal parts. In this way 50 percent elements are above the median and 50 percent elements are below the median. But for doing this it is essential that we must arrange the values of variable quantities in a series either in ascending or descending order first. In this reference it is noteworthy that median is never any special element but the result of middle element.

### Meaning and Characteristics of Median

According to Dr. Chaturvedi, "If a given series is arranged in ascending or descending order then the median is the value of the middle element of the series."

According to Ghosh and Choudhary, "Median is the value of that element in the series that divides the series into two equal parts in which the first part of the series contains elements smaller than the median and the second part contains elements greater than the median."

From the above definitions' it is clear that median is the value of the middle element of the series. For example, if in a given class 31 students are arranged according to their heights the 16th student will be the middle one and the value of his height will be the median of the height of 31 students because height is a variable quantity. Remember that $16^{th}$ student is the middle student of the series but 16 is not the median of the series but the value of the $16^{th}$ student will be the median. This way middle element is not itself the median but it is the scale of measurement for median.

There are following characteristics of median based on the above description-

a. Median is not the middle element but the value of the middle element.

b. Median divides the series into two equal parts in which the first part of the series contains elements smaller than the median and the second part contains elements greater than the median.

c. It is essential to arrange the values of variable quantities in a series either in ascending or descending order for calculating median.

## 17.9 Method of Calculating Median

The normal way to calculate median is that the series must be arranged in ascending or descending order for example—1, 2, 3, 4, 5 or 5, 4, 3, 2, 1, thereafter find the middle element of the series, the value of this middle element is the median. And if there are even numbers in a series, since there is no middle element then the value obtained by dividing the sum of middle elements by two is the median.

### Median of Simple Series

The given below two formulae's are used for calculating the median in a simple series.

**Note**

If in a particular series the number of elements is considered as n, then the formula for median will be like this-

a. If *n* is an even number than

Median $Me = \frac{n+1}{2}th$

b. If *n* is a odd number than

Median $Me = \frac{1}{2}\left[\frac{n}{2}\text{th} + \left(\frac{n}{2}+1\right)\text{th}\right]$

*Example* 8 Calculate the median of the marks obtained by 9 students in a given examination-
25, 15, 23, 40, 27, 25, 23, 25, 20

**Solution:** To calculate the median from the above formula it is necessary to first arrange the series in ascending order. It will done so when the series contains odd number of elements. After arranging the elements in ascending order the series will be such that-

| Sr. no. | Values of Elements |
|---|---|
| 1 | 15 |
| 2 | 20 |
| 3 | 23 |
| 4 | 23 |
| 5 | 25 |
| 6 | 25 |
| 7 | 25 |
| 8 | 27 |
| 9 | 40 |
| $n = 9$ | |

Because here the number of elements is odd i.e. 9, therefore we will use this formula for median-

$Me$ = Value of $\frac{n+1}{2}th$ position

= Value of $\frac{9+1}{2}th$ position

= Value of $\frac{10}{2}th$ position = value of 5th position means 25

Median $Me$ = 25

**Median of Discrete Series**

To calculate the median of discrete series, the formula used is same as that of simple series. In other words the value of $Me = \frac{n+1}{2}$ th element. In this we need to find out the cumulative frequency to find the number of elements (*n*). This statement will be more clear from the below example-

Note

*Example* 9 In a factory the weekly wages of workers is as follows. Find the median of their wages.

| Weekly wages (in dollars) | Number of workers |
|---|---|
| 25 | 25 |
| 26 | 70 |
| 27 | 210 |
| 28 | 275 |
| 29 | 430 |
| 30 | 550 |
| 31 | 340 |
| 32 | 130 |
| 33 | 90 |
| 34 | 55 |
| 35 | 25 |

**Solution:** Because in the above table the weekly wages are given in ascending order, therefore, to find the median we only need to find the cumulative frequency. The last value of cumulative frequency will be the sum of frequencies ($n$). After finding the value of $n$ we can find the element whose value will be the median of the wages using the formula $\frac{n+1}{2}$. After finding this element we will see the corresponding cumulative frequency for that. The wages corresponding to that value will be the median for the wages. This can be made more clear from the given below solution-

$$Me = \text{value of } \frac{n+1}{2} \text{ position}$$

$$= \text{value of } \frac{2200+1}{2} = \frac{2201}{2}th \text{ position}$$

$$= \text{value of } 1100.5 \text{ position}$$

| Table 17.6 | | |
|---|---|---|
| **Weekly wages (in dollars)** | **No. of workers (frequency)** | **Cumulative Frequency** |
| 25 | 25 | 25 |
| 26 | 70 | (25 + 70) = 95 |
| 27 | 210 | (95 + 210) = 305 |
| 28 | 275 | (305 + 275) = 580 |
| 29 | 430 | (580 + 430) = 1010 |
| 30 | 550 | (1010 + 550) = 1560 |
| 31 | 340 | (1560 + 340) = 1900 |
| 32 | 130 | (1900 + 130) = 2030 |
| 33 | 90 | (2030 + 90) = 2120 |
| 34 | 55 | (2120 + 55) = 2175 |
| 35 | 25 | (2175 + 25) = 2200 |
| | $n$ = 2200 | |

**Note** Because the element 1100.5 is associated with the 1.560 element (because above that there is 1010 that is smaller than 1100.5), therefore the wage associated with 1560th element is 30 i.e. the median will be 30 dollars. Therefore, the median of wages=30 dollars.

## Median of Continuous Series

Firstly we find the place of median using the formula $\frac{n}{2}$ instead of $\frac{n+1}{2}$ in a continuous series. The class-interval in which the median is located is known as median class-interval. The formula to find out the median in a continuous series is –

$$Me = L + \frac{\frac{n}{2} - F}{f} \times i$$

Where
- $Me$ = Median
- $L$ = Lower limit of median class-interval
- $n$ = sum of frequencies
- $f$ = frequency of median class-interval
- $F$ = The cumulative frequency of previous median class-interval
- $t$ = The difference between the upper and lower limits of median class-interval

*Example 10* Find the median in the table written below.

| Income (in ₹) | No. of people |
|---|---|
| 100–200 | 15 |
| 200–300 | 33 |
| 300–400 | 63 |
| 400–500 | 83 |
| 500–600 | 100 |

**Solution:** To find the median we need to find out the cumulative frequency firstly to find out the median as shown in the table given below-

| Income (in ₹) | No. of people | Cumulative frequency |
|---|---|---|
| 100–200 | 15 | 15 |
| 200–300 | 33 | (15 + 33) = 48 |
| 300–400 | 63 | (48 + 63) = 111 |
| 400–500 | 83 | (111 + 83) = 194 |
| 500–600 | 100 | (194 + 100) = 294 |
| | $n$ = 294 | |

Note

From the above calculation we can find out the median class-interval i.e. we can find out that class-interval in which median resides.

$$\text{Median class-interval} = \text{the value of } \frac{n}{2} \text{ th element}$$

$$= \frac{294}{2} = \text{the value of 147 th element}$$

The position of the 147 th element is 194 in the cumulative frequency whose class-interval is 400–500. This is median class-interval. Now we will calculate the median based on this formula-

$$Me = L + \frac{\frac{n}{2} - F}{f} \times i$$

From the above calculation-

$L$ = Lower limit of median class-interval = 400

$n$ = sum of frequencies = 294

$f$ = frequency of median class-interval = 83

$F$ = The cumulative frequency of previous median class-interval = 111

$i$ = The difference between the upper and lower limits of median class-interval = (500 – 400) = 100

$$Me = 400 + \frac{\frac{294}{2} - 111}{83} \times 100$$

$$= 400 + \frac{147 - 111}{83} \times 100$$

$$= 400 + \frac{36}{83} = 400 + \frac{3600}{83}$$

$$= 400 + 43.37 = 443.37$$

Therefore, the median of the salary = ₹ 443.37

*Example 11* The above example can also be solved using another famous formula for calculating median. This formula is only used now-a-days, which is as follows-

$$m = l + \frac{i}{f}(m - c) \text{ or } Me = l + \frac{i}{f}\left(\frac{n}{2} - c\right)$$

In above formula,

$l$ = Lower limit of median class

$t$ = Class-interval of median class

$f$ = frequency of median class

$m$ = median number i.e. $\frac{n}{2}$

**Note**

$c$ = Remember that the cumulative frequency previous to the median class-interval is calculated using $\frac{n}{2}$ instead of $\frac{n+1}{2}$.

**Solution:** Now we will solve this using the above formula-

| Income (In ₹) | Number of persons (Frequency) | Frequency |
|---|---|---|
| 100–200 | 15 | 15 |
| 200–300 | 33 | 48 |
| 300–400 | 63 | 111 |
| 400–500 | 83 | 194 |
| 500–600 | 100 | 294 |
| | ***n* = 294** | |

$$\text{Median, Class-interval} = \frac{n}{2}th \text{ value}$$

$$= \frac{294}{2} = 147th \text{ value}$$

i.e. value of 147th element.

The position of this 147th element is 194 in the cumulative frequency 400 – 500. This will only be median class. Now we will calculate the median using the above formula as shown below-

$$Me = l + \frac{i}{f}(m - c)$$

Where

$l$ = 400 (Lower limit of median class)

$i$ = 100 (Difference between the upper and lower limits of class)

(500 – 400 = 100)

$f$ = 83 (Frequency of median class)

$m$ = 147 (Median number $\frac{n}{2}$)

$c$ = 111 (Cumulative frequency before the median class)

$$Me = 400 + \frac{100}{83}(147 - 111)$$

$$= 400 + \frac{100}{83} \times 36 = 400 + \frac{3600}{83}$$

$$= 400 + 43.37 = 443.37$$

Therefore the median of the salary = ₹ 443.37

## Merits of Median

Some of the merits of median are written below-

1. Median can be easily calculated and also it is easy to understand this. By arranging the elements in an order we can easily find out the median because it is situated in between.

**Note**

2. Median is amongst the elements given. Therefore, it represents the entire population. Its value is dependent upon all elements.
3. If we know the value of all elements then without knowing the result of all elements we can find out the median. There is no need to find out the frequencies of the last element to find out the median, we only need to know the value of elements.
4. Unlike arithmetic average there is no effect of very big or very small value on calculation of median.
5. The value of median remains unaltered even after addition of some elements.
6. Median is most useful in those situations when the subject of study is such that it cannot be measured in absolute terms such as knowledge of a child, etc.

## Demerits of Median

In spite of above merits, median also has some demerits which are as follows-

a. Median cannot be calculated using algebraic methods i.e. we cannot find out the median of two or more series cumulatively if we know their separate medians. In other words, we cannot find out a common median that represents the other series accurately whose separate medians are given. It is because of this reason that the median of a given series is the middle element of that series and is nowhere related to the other series.

b. Similar to mean, median also sometimes does not represent the real situation i.e. median does not apply to any unit fully because median can be located in such a place in the series where very less or no element is similar to it.

c. If there is too much difference or deviation in the series then sometimes median is not the correct representative i.e. if there is too much difference in the details of the elements then the results can be misguiding.

# 17.10 Mode

In any series, the value that appears the most is called as the mode. In this way mode is the value of most commonly occurring value in the series. This is that value or result of the series that appears most commonly in the series and it is that result around which the values of elements gather the most. The easiest meaning of mode is that it is the value obtained by most of the people. For example, if in an examination 10 students secure 7,9,7,5,8,12,7,6,8 then 7 will be called as mode because this number is obtained the most or the number of students obtaining 7 marks is the most. From the given definitions, the meaning of mode will be clearer.

## Definition of Mode

Gilford has defined the mode like—" Mode is that point in the distribution where there is highest frequency."

Dr.Chaturvedi writes "Mode is defined as that dimension of the variable that is most commonly occurring or the point of highest frequency or the point of highest density. Mode is the value of that element in the series that has the highest special or common characteristics."

In our daily life we often hear that the average height of an Indian is 5'6"; the colour of Indians is black; most of the people are honest; there are 300 words in a page, etc. In all these statements, the word honest denotes mode. For example, when we say that the average height of an Indian is 5' 6'' than it means that the value of Indians with height 5' 6'' is highest in India.

Note

## Self-Assessment

Fill in the blanks:

4. In any _____ the value that appears the most is called as the mode.
5. Mode is that point in the distribution where there is highest _____ .
6. In our daily life we often hear that the average height of an Indian is _____ .

## Characteristics of Mode

There are following characteristics of mode based on the above description-

1. Mode is based on all the elements of the series therefore, there is no effect of very small as well as very big value element on it.
2. Mode depends on frequency. Therefore, instead of value of elements, it is based on the value of frequency of that element that has the highest frequency. Therefore, it is the smallest way to find out the mode,
3. Mode is not the highest value element but it can be the value of the element.
4. There is difficulty in finding out the mode in condition where there are two or more than two elements with the same highest frequency, In such a situation we have to describe more than two modes. For example- 1, 3, 4, 4, 6, 7, 6, 10, 7, 4, 7 we have 4 and 7 as the mode.

## Computation of Mode

Normally it is said that computation of mode is very easy because it is value of the element that has the highest frequency. Therefore, by arranging any series in a systematic order we can find out which element has the highest frequency. With the help of given examples we will focus on the methods of calculating mode.

## Mode of Simple Series

Calculation of mode in a simple series is very easy because in this the elements are arranged in the definite order according to their values and the element that has the highest frequency is the mode. This can be made clear with the help of the following example-

*Example* 12 Find the mode of given series

33,20, 35, 50, 37, 33, 35, 25, 35, 34 and 35

**Solution:** By arranging the elements according to their values, the situation will be like this-

20, 25, 33, 33, 34, 35, 35, 35, 35, 37, 50.

From the above order it is clear that 35 appears the most therefore it has the highest frequency. Therefore, the mode of given series is 35.

$$Mo = 35$$

*Notes* The symbol for mode is sometimes used as Z instead of Mo.

## Mode of Discrete Series

Note

In a discrete series, mode can be calculated using two techniques:

a. Inspection Method

b. Grouping Method

**(a) Inspection Method—** In this method by having a look at the series, the most commonly occurring frequency is found. The value of that frequency is mode. This thing will be more clear from the given below.

By making use of grouping technique, firstly the elements are arranged in a order, then their frequencies are written in front of them. Firstly the frequencies are written in two, then three and then more in various columns. In this way by distributing it in various groups we can find out which element example has the highest frequency.

*Example* 13 Find the mode of table given below.

| Value of Elements | Frequency |
|---|---|
| 5 | 1 |
| 9 | 7 |
| 13 | 11 |
| 17 | 5 |
| 7 | 2 |
| 11 | 9 |
| 19 | 4 |
| 15 | 8 |

As said earlier that firstly we find out the most commonly occurring frequency by looking at the table. The value of the frequency that will be the highest will be the mode. In the above question, the frequency of 11 is the highest. Therefore, the value of 11 i.e. 13 will be the value of mode.

**(b) Grouping Method—** Mode can be calculated using grouping method in the following way. But here one thing is noteworthy that the value of mode will be the same whether it is calculated using the inspection method or the grouping method. This statement will be clear from the following calculation-

| | Frequencies | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 5 | 1 | | | | | |
| | | 3 | | 10 | | |
| 7 | 2 | | | | | |
| | | | 9 | | 18 | |
| 9 | 7 | | | | | |
| | | 16 | | | | 27 |
| 11 | 9 | | | | | |
| | | | [20] | [28] | | |

**Note**

| | | | | | | |
|---|---|---|---|---|---|---|
| 13 | [11] | | | | | |
| | | [19] | | | 24 | |
| 15 | 8 | | | | | |
| | | | 13 | | | |
| 17 | 5 | | | | | 17 |
| | | 9 | | | | |
| 19 | 4 | | | | | |

1. Firstly the value of elements are written in a definite order such as 5, 7, 9, 11 etc. and their frequencies are written in front of them as shown in column 1.
2. Then the sum of frequencies of two is written in column 2. For example, 1 + 2 = 3; 7 + 9 = 16; 11 + 8 = 19.
3. Then leaving the first frequency, the sum of two-two frequencies is written in column 3. For example, if the first frequency is 1, then leaving this the next two 2 + 7 = 9, 9 + 11 = 20, 8 + 5 = 13 are written in column 3. Because there is no pair for the last frequency 4, hence, it is left out.
4. Then the sum of three-three frequencies is written in column 4. For example, 1 + 2 + 7 = 10, 9 + 11 + 8 = 28 are written in column 4. Since there is no pair for frequencies 5 and 4, hence, it is left out.
5. Then leaving the first frequency, the sum of three-three frequencies is written in column 5. For example, if the first frequency is 1, then leaving this the next three is 3+7+9= 19, 11+8+5=24 are written in column 5. Because there is no pair for the last frequency 4 hence it is left out.
6. After this leaving the first two frequencies the sum of three frequencies are written in column 6. For example, the first two frequencies 1 and 2 are left out and the sum of three-three frequencies, 7+9+11=27, 8+5+4=17 is written in column 6.
7. After making this full table we can find out which is the greatest frequency in every column. Column 1, in 11 is the greatest, column 2, in 19 is the greatest, column 3, in 20 is the greatest, column 4, in 28; column 5, in 24 and column 6, in 27 is the biggest number which is displayed inside a box in the table. The value in front of these numbers can be shown in the following table:

**Table 17.7 Analysis Table**

| Column No. | Value of Element with Maximum Frequency | | | | |
|---|---|---|---|---|---|
| 1 | | | 13 | | |
| 2 | | | 13 | 15 | |
| 3 | | 11 | 13 | | |
| 4 | | 11 | 13 | 15 | |
| 5 | | | 13 | 15 | 17 |
| 6 | 9 | 11 | 13 | | |
| Frequency numbes | 1 | 3 | 6 | 3 | 1 |

The above table has been made in this way. By looking at the column 1 frequencies we find out that 11 is the biggest number so the value in front of 11 that is 13 is written in front of column 1. Column 2, in 19 is the biggest number that is obtained by adding 11 and 8 and the values in front of 11 and 8

**Note**

is 13 and 15 respectively. Therefore, in the above table 13 is written in front of column two. Column 20 is the biggest number that is the sum of 9 and 11 and the values related to these are 11 and 13 which is written in front of column 3 in the table. The biggest number in column four in the table is 28 which is the sum of 9, 11 and 8 and the values related to this are 11, 13 and 15 which is written in front of column 4. In the same way column 5 and 6 are also filled and then the sum of frequencies is written at the last in the table. Form this sum we find out that the frequency of 13 has appeared the most that is 6 times. Therefore 13 is the mode.

## Another Technique for Calculating Mode—

*Example* 14 Calculate the mode of given series-

| Shape: | 10 | 12 | 18 | 30 | 32 | 35 | 27 | 33 | 36 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency: | 4 | 7 | 3 | 2 | 5 | 9 | 8 | 3 | 5 | 2 | 6 |

The above question can be solved with the help of the given table—

| **Size** | **Frequency (*f*)** | **Pair of Two (Two Times)** | | **Pair of Three (Three Times)** | | | **Analysis** |
|---|---|---|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
| 10 | 4 | | | | | | |
| | | 11 | | | | | |
| 12 | 7 | | 10 | 14 | | | |
| 18 | 3 | | | | 12 | | |
| | | 5 | | | | 10 | I = 1 |
| 30 | 2 | | | | | | III = 3 |
| 32 | 5 | | 7 | | | | $\not{\text{IIII}}$ = 6 |
| | | 14 | | 16 | | | IIII = 4 |
| 35 | 9 | | | | 22 | 20 | |
| 27 | 8 | | 17 | | | | II = 2 |
| | | 11 | | | | | |
| 33 | 3 | | | 16 | | | I = 1 |
| | | 7 | | | 10 | 13 | |
| 37 | 5 | | 8 | | | | |
| 45 | 2 | | | | | | |
| | | | 8 | | | | |
| 50 | 6 | | | | | | |

From the above table we find out the frequency of 9 appears 6 times, that is the highest, therefore the value of frequency 9 is the mode.

$\therefore$ $Mo = 35$

**The methodology of solving through above method-**

1. Firstly we will have to add two frequencies and write their sum in column 2. For example, 4+7=11, 3+2= 5, etc. If in the end there is no pair of two then we will leave that element as 7 has been left out.

**Note**

2. After this leaving the first frequency again the next two frequencies are added together and their sum is written in column 3. For example, in above table the frequency 4 is the first frequency, so leaving this the next two frequencies i.e. 2+5 =7 is written in column 3. If in the end there is no pair the element is left out.
3. After this the three frequencies are added together and their sum is written in column 4, for example 4+7+3=14, 2+5+9=16, etc. If in the end we cannot find three elements then it is left out.
4. After this leaving the first frequency again the next three frequencies are added together and their sum is written in column 5. For example, 7+3+2= 12. If in the end we cannot find three elements then it is left out.
5. After this leaving the first two frequencies, third time again we write the sum of three elements in column 6. For example: 3+2+5=10, 9+8+3= 20, etc. If in the end we cannot find three elements then it is left out.
6. After this while doing the analysis we must keep in mind the frequencies of column 1 to 6. The frequency that is highest in column 1, we will put a tick mark against that in column 7. For example, in column 1 the frequency of 9 is the highest therefore, we will put a tick mark against 9 in column 7. After this the frequency of which elements is highest in column 2,3,4,5,6 and that sum in column 1 we will put a tick in column 7. For example, in column 2 the sum of 14 is highest, and this sum is of 5 and 9 in column 1 therefore, we will put a tick against 5 and 9 in column 7. In the same way the sum of 17 is the highest in column 3 and this sum is of 9 and 8 in column 1. Therefore, we will put atick against 9 and 8 in column 7.
7. In this way after doing the analysis, the frequency that has the highest ticks against them in column 7, the value of that will be our mode, For example, in the above table the highest 6 ticks are against the frequency 9. Therefore, the value of 9 i.e, 35 in the above table is the mode.

## Mode of Continuous Series

**To** find the mode of a continuous series firstly we need to find out the class-interval in which mode is located by analysis. If there is more than one mode or we can find out the mode by analysis then we need to find out the class-interval of mode by using the above technique as shown in the table. Thereafter the mode can be calculated by the given formula.

$$Mo = L + \frac{f - f_1}{2f - f_1 - f_2} \times i$$

Where

$Mo$ = Mode
$L$ = Lower limit of mode class-interval
$i$ = the difference between the upper and lower limit of mode class-interval.
$f$ = frequency of mode class-interval
$f_1$ = the frequency of class-interval before mode class-interval
$f_2$ = the frequency of class-interval after mode class-interval

*Example 15* In the table given below the marks of 40 students are listed. Find the mode by using inspection method and grouping method.

Note

| Marks Obtained | 0–10 | 10–20 | 20–30 | 30–40 | 40–50 | 50–60 | 60–70 | 70–80 |
|---|---|---|---|---|---|---|---|---|
| Number of Students | 5 | 4 | 8 | 6 | 2 | 6 | 7 | 2 |

**Solution: (A) Calculation of mode by inspection method-**

| Marks Obtained | Number of Students |
|---|---|
| 0–10 | 5 |
| 10–20 | 4 ($f_1$) |
| 20–30 | 8 ($f$) |
| 30–40 | 6 ($f_2$) |
| 40–50 | 2 |
| 50–60 | 6 |
| 60–70 | 7 |
| 70–80 | 2 |

In the given question the frequency of 8 is highest and its value is given in the class interval 20–30. Therefore, to find the real value of this class interval we will use the given formula.

$$Mo = L + \frac{f - f_1}{2f - f_1 - f_2} \times i$$

In this way

$L$ = 20 (Lower limit of mode class-interval)

$f$ = 8 (Frequency of mode class-interval)

$f_1$ = 4 (The frequency of class interval-before mode class-interval)

$f_2$ = 6 (The frequency of class-interval after mode class-interval)

$i$ = 10 (The difference between the upper and lower limit of mode class-interval [30 – 20 = 10])

Putting the above values in the formula

$$Mo = 20 + \frac{8 - 4}{28 - 4 - 6} \times 10$$

$$Mo = 20 + \frac{4}{16 - 4 - 6} \times 10$$

$$Mo = 20 + \frac{41}{6}$$

$$Mo = 20 + 6.67 = 26.67$$

therefore mode $Mo = 26.67$

Note

**(B) Calculation of mode through grouping method.**

| Marks obtained | No. of Students | | Pair of Two (Two Times) | | Pair of Three (Three Times) | | | Analysis |
|---|---|---|---|---|---|---|---|---|
| | (*f*) | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 0–10 | 5 | | | | | | | I = 1 |
| | | | 9 | | | | | |
| 10–20 | 4 | ($f_1$) | | | 17 | | | II =2 |
| | | | | 12 | | | | |
| 20–30 | 8 | (*f*) | | | | 18 | | =5 |
| | | | 14 | | | | | |
| 30–40 | 6 | ($f_2$) | | 8 | | | 16 | III = 3 |
| | | | | | | | | |
| 40–50 | 2 | | 8 | | 4 | | | I = 1 |
| 50–60 | 6 | | | | | 15 | | I = 1 |
| 60–70 | 7 | | | 13 | | | | |
| 70–80 | 2 | | | | | | 15 | I = 1 |

In the above table the frequency of 8 is 5 which is the highest. Therefore, we will use the given formula to calculate its real value (which is in class-interval 20–30)

$$MoL = L + \frac{f - f_1}{2f - f_1 - f_2} \times i$$

$$Mo = 20 + \frac{8 - 4}{8 \times 2 - 4 - 6} \times 10$$

$$Mo = 20 + \frac{4}{16 - 4 - 6} \times 10$$

$$Mo = 20 + \frac{40}{6}$$

$$Mo = 20 + 6.67$$

$$(Mo) = 26.67$$

Therefore, the mode is 26.67

*Notes* For grouping we will use the same rule that was applied in the grouping of discrete series. It must also be remembered that the answer obtained for calculation of mode from both the techniques that is inspection techniques and grouping technique must be same.

## Merits of Mode

1. Mode is the highest representative value of the series because mode is the value of the element that has the highest frequency in the series.

Note

2. Its meaning can be understood easily, mode is that value that appears the highest in the series.
3. Mode can be calculated easily, swiftly and practically.
4. One noteworthy characterestic of mode is that there is no effect of very big or very small value element because mode is that value which appears the highest number of limes in the series.
5. Mode can be calculated without finding the value of smallest and highest elements with the condition that those elements are not of mode class.
6. Mode can be easily calculated with the help of graph.
7. Mode is very useful for manufacturers who produce in a large scale because on the basis of mode they analyze the size of production. For example, in the market we usually find the size of those shoes which fit into the legs of most of the people. If any person has an exceptionally big size feet than he does not get a shoe of his size in the market. This thing also applies to readymade clothes.

## Demerits of Mode

1. Algebra cannot be used in mode because its calculation is based on frequencies.
2. Mode disregards the highest and lowest value elements and resultantly we cannot estimate anything about them.
3. Sometimes we cannot find the definite value of mode easily. There is difficulty in situations where there are more than one mode in a series.
4. Mode does not represent all the elements of a series but it only represents the highest frequency elements. For example, in 100 students 5 students have 3 marks whereas all other students have different marks but more than 3. In that situation mode will be 3 which will only represent 5 students and leave 95 students.

From the above discussion it is clear that mean, median, and mode, are the representative of those numbers which define the condition between various facts and point towards the mean trend amongst them. When we cannot find out the result between various facts than in that condition the trend towards mean acts as a guiding path, refrains us from getting deviated from the result and saves us from illusionary and unscientific facts. Only a scientist can know the importance of this for a scientific research.

## 17.11 Summary

- Average is a number that represents complete series and manifests the central value which is situated in the centre of the maximum and minimum value of those series.
- The following types of averages: (a) Average of Position—Mode, Median (b) Mathematical Averages—Arithmetic Average and Mean, Geometric Mean, Harmonic Mean, Quadratic Mean (c) Other of Business Averages—Moving Average, Progressive Average.
- Arithmetic mean is obtained by dividing the sum of values of a variable by the number of variables.
- Median is that point which divides a given series into two equal parts.
- In any series, the value that appears the most is called as the mode.

Note

## 17.12 Keywords

1. **Mean:** Arithmetic average which is also called as mean is that result that is obtained by dividing the sum of values of a variable by its number.
2. **Median:** Median is the value of that element in the series that divides the series into two equal parts in which the first part of the series contains elements smaller than the median and the second part contains elements greater than the median.
3. **Mode:** The value that comes the highest number of times in a series is called as mode.

## 17.13 Review Questions

1. Describe the meaning and use of statistical average.
2. Describe the goal and types of statistical average.
3. Describe the method of arithmetic average.
4. Describe the merits and demerits of arithmetic average.
5. What is the meaning of median and describe the method of calculation of median.
6. Describe the merits and demerits of median.
7. Describe the meaning and characteristics of mode.
8. Describe the methods of calculation of mode.
9. Describe the merits and demerits of mode.

## Answers: Self Assessment

**1.** Average
2. Average or arithmetic average
3. Arithmetic average
4. Series
5. Frequency
6. 5′ 6″

## 17.14 Further Readings

*Books*

1. Shodh Pravidhi—Dr. Ganesh Pandey, Arun Pandey, Radha Publications.
2. Shastriya Samajik Chintan—Agarwal Gopal Krishan, Bhatt Brothers.

# Unit–18: Measures of Dispersion: Standard Deviation

Notes

CONTENTS



## Objectives

After studying this unit students will be able to:

- Understand the meaning of variation
- Know about the means of measuring variation.
- Know about the method of calculating mean deviation and standard deviation.

## Introduction

Variation expresses the information contained in a class of data regarding their similarity, uniqueness and homogeneity. Using variation, we can obtain information about social activities in social research regarding their similar and constant features. Also, we use this basis to establish a solid concept of deviations in the information.

Variation helps increase our predictability i.e. it becomes easier to predict the future of subject of any information. Variation helps us prevent getting distracted from certain results and saves us from uncertain knowledge.

## 18.1 Measures of Variation or Dispersion

### Meaning of Variation

Variation or dispersion is that quality which tells us the measure of deviation of a set of values from its mean (or average of values). It is true that mean quantities (arithmetic mean, median, mode) does help us to find out central theme of the complete series but is not possible to have complete and accurate

Notes

knowledge in cases when there is large difference between elements of a series and its mean. If we see it from a behavioural perspective, we can find plenty of instances wherein arithmetic mean gives uncertain knowledge about the elements of series. For example, consider the earnings of members of a family to be ₹ 20, ₹ 60, ₹ 200, ₹ 50 and ₹ 70 respectively, then the average earning per members is ₹ 80. If we do not have knowledge about individual earnings of each member, then we would assume that each member would have earning close to ₹ 80. However, the actual situation is quite different wherein members' earnings are very dissimilar. Therefore, in these situations, it is required to have a measure that can give maximum information about individual elements of a series. In other words, this measure gives us information about the deviation of each individual element of the series from the mean of the series. These measures are known as measures of variations.

The meaning of variation can still be clarified using another example. Suppose two students secure 28, 60, 60, 92 marks and 56, 60, 60, 64 marks in four subjects wherein maximum marks in each subject is 100 and minimum passing marks is 33. If we find out the arithmetic mean to assess the level of students, then arithmetic means for both students comes out to be 60.Therefore, on this basis, it looks like both students are of same intellect level, but this is actually not true because the first student has failed in his first subject while the second student has passed in all subjects. Therefore, it is clear that only mean cannot help us ascertain the true nature of any series.

*Did You Know?* It is also important to know how much each element of a series is deviated from the mean. This deviation is known as variation or dispersion.

## Measures of Dispersion

### *The chief measures of variation are as follows—*

1. Range
2. Quartile Deviation
3. Mean Deviation
   a. From Arithmetic mean
   b. From Median
   c. From Mode
4. Standard Deviation

# Range

The difference between the maximum value and minimum value of elements contained in a series or sequence is known as the range of the series. For example, if a group contains values like 17, 10, 13, 5, 8, 20 and 25, then the element with highest value is 25 and that with least value is 5. Hence, the range of the series will be (25 – 5) = 20.

There are certain advantages of finding out the range of any series. For example, (1) it is very easy to find out the spread of any series, one needs to find only the maximum and minimum value. (2) Based on the range, it can also be estimated that the individual elements lie within what values. All these features facilitate the use of range for quick and easy estimation, but the purity of result cannot be

guaranteed. Therefore, range is classified as the crude measure of variation of a set of data. Moreover, range is also susceptible to very large and extremely small values contained within a series.

Notes

## 18.2 Quartile Deviation

If $N$ values of a variable are arranged in ascending or descending order, then $\frac{N+1}{4}$ the value is known as the first quartile ($Q_1$), $2\frac{(N+1)}{4}$ th value is known as second quartile($Q_2$), $3\frac{(N+1)}{4}$ value is known as third quartile ($Q_3$). The half of the difference between the third quartile and first quartile is known as the quartile deviation and is represented as:

$$\text{Quartile Deviation} = \frac{Q_3 - Q_1}{2}$$

*Example 1* Find out the Quartile Deviation of the below given values:

10, 17, 12, 28, 24, 22, 15, 30, 35, 38, 20.

**Solution:** On arranging values in ascending order

10, 12, 15, 17, 20, 22, 24, 28, 30, 35, 38

Since the number of values here is 11, therefore $N = 11$.

Therefore, $Q_3 = \frac{11+1}{4}$

$= 3^{rd}$ Value

$Q_1 = 15$

Similarly $Q_2 = \frac{3(11+1)}{4}$

$= \frac{3\times 12}{4}$

$= 9^{th}$ value

So, $Q_3 = 30$

Quaterly Deviation $= \frac{Q_3 - Q_1}{2}$

$= \frac{30-15}{2}$

$= 7.5$ marks

## 18.3 Coefficient of Quartile Deviation

It is not possible to compare the variation of different series using quartile deviation since it is an absolute measure. Another term known as Coefficient of Quartile Deviation is derived using quartile deviation, which is represented as

Notes

$$\text{Coefficient of Quartile Deviation} = \frac{Q_3 - Q_1}{Q_3 + Q_1}$$

For the above example,

$$\text{Coefficient of Quartile Deviation} = \frac{30 - 15}{30 + 15} = \frac{15}{45}$$

$$= \frac{1}{3}$$

## 18.4 Mean Deviation

Mean deviation is the arithmetic mean of difference of each element of the series with the mean of the series. According to Ghosh and Chowdhury, if the sum of deviation of each member of the series from its mean is divided by the number of members, then the result is known as mean deviation. In other words, first calculate the individual deviation of each element from the mean of series, then sum up all the deviation, divide the sum by the number of elements, then the result is known as the mean deviation. Their main properties are:

1. It is calculated using mathematical techniques and involves each entity of the series.
2. Variation is calculated from the mean i.e. it can be arithmetic mean or median or mode. When the variation is calculated using arithmetic mean, then it is known as mean deviation from mean. When the variation is calculated using median, then it is known as mean seviation from median, while when the variation is calculated using mode, then it is known as mean deviation from mode.

### Self Assessment

Fill in the blanks:

1. Mean deviation is the _____ of the difference of each element of series from the mean.
2. If the sum of differences of deviations of individual elements from mean is divided by the number of elements, then we obtain _____.
3. The _____ is calculated from mean, be it arithmetic mean, median or mode.

## 18.5 Calculation of Mean Deviation

Calculation of mean deviation is done in the following ways:

a. If it required to find the mean of a simple series, then–

$$\delta = \frac{\Sigma d}{n}$$

Where the different symbols used in the above equation are defined as

$\delta$ = Mean deviation

$\sum d$ = Sum of deviations of individual elements of series from the mean (can be arithmetic mean/ median/ mode)

$n$ = Number of elements.

Notes

b. If it is required to find the mean of a simple series, then–

$$\delta = \frac{\Sigma f d}{n} \text{ or } \frac{\Sigma fd}{\Sigma f}$$

Where the different symbols used in the above equation are defined as

$\delta$ = Mean deviation

$f$ = Frequency of elements

$d$ = Variation of each element from the mean (can be arithmetic mean/median/mode)

$fd$ = Product of frequency of elements and their variation

$\sum fd$ = Sum of product of frequency of elements and their variation

$\sum f$ or $n$ = Sum of frequency

Now let us solve some practical questions based on the above methods.

## 18.6 Simple Series

To find out the mean deviation of a simple series:

a. Firstly calculate mean (depending upon question whether it is arithmetic mean, median or mode)

b. Find out the value of variation of each element from the mean (arithmetic mean or median or mode)

c. Find out the sum of all variations i.e. $\sum d$.

d. Find out the total number of elements (as represented by $n$).

e. Lastly use $\sum d/n$ formula to calculate the mean deviation.

*Did You Know?* To calculate mean deviation from arithmetic mean, one has to first calculate arithmetic mean.

The above rules to solve questions will become clearer from the below examples.

*Example 2* The weekly wages of labourers in a workshop is given as follows. Find out the mean deviation of the wages while considering arithmetic mean as well as mode separately.

Wages are (in ₹) 120, 135, 142, 135, 140, 155, 135, 125, 146, 160, and 150.

**Solution:** (i) Considering arithmetic mean as basis in order to find the mean deviation in the given question from the arithmetic mean, we need to first find the arithmetic mean, which is found out as:

**Notes**

Total of Wages: $\Sigma x = 120 + 135+142+135+148+155+135+125+146+160+150 = \Sigma x = 1551$

$n = 11$ (no. of labours)

$\therefore$ Arithmetic Mean ($M$) $= \frac{\Sigma x}{n} = \frac{1551}{11} = 141$

$\therefore$ $M = ₹\,141$

Keeping this arithmetic mean in mind, in order to calculate the mean deviation, we need to make the below table—

| **Wages (in ₹) (X)** | **Mean (M)** | **(X – M) = *'d'**** |
|---|---|---|
| 120 | 141 | 120 – 141 = 21 |
| 135 | 141 | 135 – 141 = 6 |
| 142 | 141 | 142 – 141 = 1 |
| 135 | 141 | 135 – 141 = 6 |
| 148 | 141 | 148 –141 = 7 |
| 155 | 141 | 155 – 141 = 14 |
| 135 | 141 | 135 – 141 = 6 |
| 125 | 141 | 125 – 141 = 16 |
| 146 | 141 | 146 – 141 = 5 |
| 160 | 141 | 160 – 141 = 19 |
| 150 | 141 | 150 – 141 = 9 |
| n=11 | | $\Sigma d = 110$ |

*Notes* There is no need to consider the + sign or – sign in this computation.

Now using the method to calculate mean deviation, we will compute it as shown below:

Mean Deviation (M.D) or $\delta = \frac{\Sigma d}{n}$

Here $\Sigma d = 110$

$n = 11$ (no. of labourers)

$\delta = \frac{110}{11} = 10$

$\therefore$ Mean Deviation $(\delta) = ₹\,10.$

**(ii) Considering median as basis—**In order to find the mean deviation in the given question from the median, we need to first find the median, which is found out as below:

Notes

Arranging the wages in ascending order:

120,125, 135, 135, 135, 142, 146, 148, 150, 155, 160

$$\therefore \quad \text{Median } (Me) = \frac{n+1}{2} \text{ Element value}$$

Here $n$ = 11 (No. of labourers)

$$\therefore \quad Me = \frac{11+1}{2} \text{ Element value;}$$

$$= \frac{12}{2} = 6^{th} \text{ Element Value}$$

$6^{th}$ Element Value = 142

Therefore, median (*Me*) = ₹ 142

Keeping this median in mind, now we have to formulate the following table in order to compute the mean deviation.

| **Wages (in ₹) (*X*)** | **Median (*Me*)** | **(*X* – *Mo*) = (‘*d*’*)** |
|---|---|---|
| 120 | 142 | (120 – 142) = 22 |
| 125 | 142 | (125 – 142) = 17 |
| 135 | 142 | (135 – 142) = 7 |
| 135 | 142 | (135 – 142) = 7 |
| 135 | 142 | (135 – 142) = 7 |
| 142 | 142 | (142 – 142) = 0 |
| 146 | 142 | (146 –142) = 4 |
| 148 | 142 | (148 – 142) = 6 |
| 150 | 142 | (150 – 142) = 8 |
| 155 | 142 | (155 – 142) = 13 |
| 160 | 142 | (160 – 142) = 18 |
| $n$ = 11 | | $\Sigma d$ = 109 |

*Notes* There is no need to consider the + sign or – sign in this computation.

Now using the method to calculate mean deviation, we will compute it as shown below:

$$\delta = \frac{\Sigma d}{n}$$

Here, $\Sigma d$ = 109

$n$ = 11 (No. of labourers)

$$\delta = \frac{109}{11}$$

$$= 9.91$$

Therefore, mean deviation (δ) = ₹ 9.91

**Notes**

**(iii) Considering mode as basis—** In order to find the mean deviation in the given question from the mode, we need to first find the mode, which is found out as below:

Arranging the wages in a particular order:

120,125, 135, 135, 135, 142, 146, 148, 150, 155, 160

From the above order, it is clear that 135 is used the maximum number of times and its frequency is 3.

Therefore,

$\therefore$ $Mo$ = ₹ 135

Keeping this mode in mind, now we have to formulate the following table in order to compute the mean deviation.

| **Wages (in ₹) ($x$)** | **Mode ($Mo$)** | **($x$ – $Mo$) = "($d$)"*** |
|---|---|---|
| 120 | 135 | 120 – 135 = 15 |
| 125 | 135 | 125 – 135 = 10 |
| 135 | 135 | 135 – 135 = 0 |
| 135 | 135 | 135 – 135 = 0 |
| 135 | 135 | 135 – 135 = 0 |
| 142 | 135 | 142 – 135 = 7 |
| 146 | 135 | 146 – 135 = 11 |
| 148 | 135 | 148 – 135 = 13 |
| 150 | 135 | 150 – 135 = 15 |
| 155 | 135 | 155 – 135 = 20 |
| 160 | 135 | 160 – 135 = 25 |
| $n$ = 11 | | $\Sigma d$ = 116 |

*Notes* There is no need to consider the + sign or – sign in this computation.

Now using the method to calculate mean deviation, we will compute it as shown below:

$$\delta = \frac{\Sigma d}{n}$$

Here, $\Sigma d = 116$

$n$ = 11 (No. of labourers)

$$\delta = \frac{116}{11}$$

$$= 10.54$$

Therefore, mean deviation ($\delta$) = Rs 10.54.

Notes

*Notes* In the computation of Mean Deviation, whether we use Arithmetic Mean, Median or Mode, it is not necessary that the final result should be the same in all the cases. It can be same as well as different also.

## 18.7 Discrete Series

To compute mean deviation in a discrete series:

a. We have to calculate the mean (depending on question whether it is arithmetic mean, median or mode) first.

b. Then we have to compute the difference between each value of element and the mean (arithmetic mean, median or mode) which is represented as '*d*' in equation.

c. Then we have to compute the product (*fd*) of the frequency (represented as '*f* ' in equation) and the variation.

d. Then we have to add all such products to obtain the sum of products $\Sigma fd$.

e. Then we have to compute the sum $\Sigma f$ of frequencies ($f$) or $n$.

f. Finally we have to use $\frac{\Sigma f d}{\Sigma f}$ or $\frac{\Sigma fd}{n}$ to compute mean deviation.

The above rules to solve questions can be easily understood using the following examples.

*Example 3* The following are the marks obtained by students in statistics. Using arithmetic mean, median and mode as basis, find out the mean deviation for all the three cases.

| Obtained Marks | 12 | 25 | 27 | 30 | 35 | 15 | 40 | 45 | 50 | 35 |
|---|---|---|---|---|---|---|---|---|---|---|
| No. of Students | 4 | 3 | 2 | 2 | 5 | 8 | 9 | 6 | 7 | 4 |

**Solution: (i) Considering Arithmetic Mean as Basis—** In order to calculate the mean deviation using arithmetic mean, we first need to compute the arithmetic mean, which is computed as shown below:

**Table 18.1**

| Obtained Marks ($x$) | No. of Students ($f$) | $f.x$ (Product) |
|---|---|---|
| 12 | 4 | (12 × 4) = 48 |
| 25 | 3 | (25 × 3) = 75 |
| 27 | 2 | (27 × 2) = 54 |
| 30 | 2 | (30 × 2) = 60 |

**Notes**

| | | |
|---|---|---|
| 35 | 5 | (35 × 5) = 175 |
| 15 | 8 | (15 × 8) = 120 |
| 40 | 9 | (40 × 9) = 360 |
| 45 | 6 | (45 × 6) = 270 |
| 50 | 7 | (50 × 7) = 350 |
| 35 | 4 | (35 × 4) = 140 |
| Total | $\Sigma f = 50$ | $\Sigma d = 1652$ |

Formula of arithmetic mean—

$$= m\frac{\Sigma fx}{\Sigma f}$$

$$= \frac{1652}{50}$$

$$= 33.04$$

Therefore, arithmetic mean = 33 (Approximately)

Now considering this arithmetic mean as basis, we will find out the variation i.e. $(x - M) = d$. After that, we will have to compute the product ($fd$) of number of students ($f$) and the corresponding variation (d). Finally we will use $\frac{\Sigma f d}{\Sigma f}$ or $\frac{\Sigma fd}{n}$ to compute mean deviation. The table below illustrates this concept.

| **Obtained Marks ($x$)** | **No. of Students ($f$)** | **Variation $x - m = d$** | **Product of no. of students and variation** |
|---|---|---|---|
| 12 | 4 | (12 – 33) =21 | (4 × 21) = 84 |
| 25 | 3 | (25 – 33) = 8 | (3 × 8) = 24 |
| 27 | 2 | (27 – 33) = 6 | (2 × 6) = 12 |
| 30 | 2 | (30 – 33) = 3 | (2 × 3) = 6 |
| 35 | 5 | (35 – 33) = 2 | (5 × 2) = 10 |
| 15 | 8 | (15 – 33) = 18 | (8 × 18) = 144 |
| 40 | 9 | (40 – 33) = 7 | (9 × 7) = 63 |
| 45 | 6 | (45 – 33) = 12 | (6 × 12) = 72 |
| 50 | 7 | (50 – 33) = 17 | (7 × 17) = 119 |
| 35 | 4 | (35 – 33) = 2 | (4 × 2) = 8 |
| Total | $\Sigma f = 50$ | | $\Sigma fd = 542$ |

Formula for Mean Deviation (M.D.)

$$\delta = \frac{\Sigma f d}{\Sigma f} = \frac{542}{50} = 10.84$$

Mean Deviation = 10.84

Notes

(ii) **Considering Median as Basis—** In order to calculate the mean deviation using arithmetic mean, we first need to compute the arithmetic mean, which is computed as shown below:

| Table 18.2 | | |
|---|---|---|
| **Obtained Marks (*x*)** | **No. of Students (*f*)** | **Cumulative Frequency (*f f f*)** |
| 12 | 4 | 4 |
| 25 | 3 | (4 + 3) = 7 |
| 27 | 2 | (7 + 2) = 9 |
| 30 | 2 | ( 9 + 2) = 11 |
| 35 | 5 | (11 + 5) = 16 |
| 15 | 8 | (16 + 8) = 24 |
| 40 | 9 | (24 + 9) = 33 |
| 45 | 6 | (33 + 6) = 39 |
| 50 | 7 | (39 + 7) = 46 |
| 35 | 4 | (46 + 4) = 50 |
| Total | $n$ = 50 | |

Formula for median–

$$Me = \frac{n+1}{2}$$

$$= \frac{50+1}{2} = \frac{51}{2} = 25.5^{th} \text{ Element.}$$

Since $25.5^{th}$ element is included in the cumulative frequency column with the $33^{th}$ element (prior to that 24 is present but it is less than 25.5), therefore the marks obtained for 33th element will be the value of median which is 40 in this case.

$\therefore$ $Me = 40$

Now we will find out the variation $(x–Me) = d$ of the marks keeping this median in mind. Finally we will use the formula for mean deviation ($\delta$) to find out the value for mean deviation. The below computational description is the illustration for this method.

| **Obtained Marks (*x*)** | **No. of Students (*f*)** | **Variation (*x–Me*) = *d**** | **Product of no. of Students and variation (*f. d.*)** |
|---|---|---|---|
| 12 | 4 | 12 – 40 =28 | (4 × 28) = 112 |
| 25 | 3 | 25 – 40 = 15 | (3 × 15) = 45 |
| 27 | 2 | 27 – 40 = 13 | (2 × 13) = 26 |
| 30 | 2 | 30 – 40 = 10 | (2 × 10) = 20 |
| 35 | 5 | 35 – 40 = 5 | (5 × 5) = 25 |
| 15 | 8 | 15 – 40 = 25 | (8 × 25) = 200 |
| 40 | 9 | 40 – 40 = 0 | (9 × 0) = 0 |

Notes

## 18.8 Standard Deviation

It is represented as S.D or σ (small sigma) in symbolic way. One major problem in computation of mean deviation is that we do not consider the positive (+) or negative (–) sign and consider it as additive. We overcome this problem in standard deviation. We square the value of variation in order to eliminate the effect of positive and negative sign in variation. Then we calculate the value of standard variation.

*Task* What is meant by standard deviation? Give a brief explanation.

### Computation of Standard Deviation

We do the following computation to calculate the value of standard deviation.

1. We find out the square ($d^2$) of variation from the arithmetic mean.
2. We find the sum of squares of variations ($\Sigma d^2$).
3. We divide this sum by the number ($N$) of elements $\sqrt{\frac{\Sigma d}{N}}$.
4. Then we find out the square root of the obtained value $\sqrt{\frac{\Sigma d^2}{N}}$.

In this way, the formula for Standard Deviation is

$$\text{S.D. or } \sigma = \sqrt{\frac{\Sigma d^2}{N}}$$

To make it more clear, we can expand $d$ as $d = x - M$ as

$$\sigma = \sqrt{\frac{\Sigma (x - M)^2}{N}}$$

Where

$\sigma$ = Standard Deviation
$x$ = Variable value or values of different elements in a series or sequence
$M$ = Arithmetic mean of elements
$N$ = Total number of elements
$d$ = $(x - M)$

The technique which uses the formula $\sigma = \sqrt{\frac{\Sigma d^2}{N}}$ to calculate standard deviation is known as the direct method of calculating standard deviation. If the arithmetic mean of the elements is not an integer, then d comes out to be a decimal number making the calculation cumbersome. In order to avoid this we use a concise technique.

### Formula for Short–cut Method —

$$\text{S.D. or } \sigma = \sqrt{\frac{\Sigma (x - A)^2}{N} - \left\{\frac{\Sigma (x - A)}{N}\right\}^2}$$

Notes

In this formula

$x$ = Variable value or value of elements in a series

$A$ = assumed mean

$N$ = Total number of elements

If we represent $(x - A)$ by $d'$, then the formula becomes

$$\sigma = \sqrt{\frac{\Sigma d'^2}{N} - \left(\frac{\Sigma d'}{N}\right)^2}$$

The above formulae (i) and (ii) are used for simple series. These formulae are slightly changed in the case of calculation of standard deviation (S.D.) for discrete series and continuous series.

## Formula for Discrete Series–

### *(i) By direct method*

$$\sigma = \sqrt{\frac{\Sigma f d^2}{N}}$$

In the above formula

$\sigma$ = Standard Deviation

$f$ = Frequency of Elements

$d$ = $(x - M)$ where $M$ is arithmetic mean

$N$ = Total sum of frequencies

### *(iii) By short–cut method*

$$\sigma = \sqrt{\frac{\Sigma F' d^2}{N} - \left(\frac{\Sigma F' d}{N}\right)^2}$$

In the above formula

$\sigma$ = Standard Deviation

$f'$ = Frequency of Elements

d = (x–A) where A is assumed mean

N = Total sum of frequencies

## Formula for Continuous Series–

### *(i) By direct method*

$$\sigma = \frac{\Sigma f d^2}{N}$$

In the above formula

$\sigma$ = Standard Deviation

$f$ = Frequency of Elements

**Notes**

$d$ = the difference $(x - M)$ of the central value (x) of class–interval and M where M is arithmetic mean

$N$ = Total sum of frequencies

## (i) By Short–cut Method

$$\sigma = i\sqrt{\frac{\Sigma f d^2}{N} - \left(\frac{\Sigma f d}{N}\right)^2}$$

The formula can be further simplified as below

$$\sigma = \frac{i}{N}\sqrt{N\Sigma f d^2 - (\Sigma f d)^2}$$

In the above formula

$\sigma$ = Standard Deviation

$t$ = Interval range

$f$ = Frequency of Elements

$d$ = the difference $(x–M)$ of the central value $(x)$ of class–interval where $x$ is arithmetic mean

$N$ = Total sum of frequencies

In order to make it more clear the use of above formulae for computation of standard deviation, we shall consider example of each type of series.

## (a) Simple Series

*Example 4* Find out the standard deviation of the following values:

10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32

**Solution:** We will use Direct Method to solve it in the following way

Formula $\sigma = \frac{\Sigma d^2}{N}$

| **Obtained Marks (*X*)** | **Variation (*d*) from mean (*M*) Here Mean = 21** | **Square of Variation ($d^2$)** |
|---|---|---|
| 10 | –11 | 121 |
| 12 | –9 | 81 |
| 14 | –7 | 49 |
| 16 | –5 | 25 |
| 18 | –3 | 9 |
| 20 | –1 | 1 |

Notes

| | | |
|---|---|---|
| 22 | +1 | 1 |
| 24 | +3 | 9 |
| 26 | +5 | 25 |
| 28 | +7 | 49 |
| 30 | +9 | 81 |
| 32 | +11 | 121 |
| $\Sigma x = 252$<br>$N = 12$ | | $\Sigma d^2 = 572$ |

$$\text{Arithmetic mean (M)} = \frac{\Sigma x}{N}$$

$$M = \frac{25^2}{12} = 21$$

Standard Deviation $(\sigma) = \sqrt{\left(\frac{\Sigma d^2}{N}\right)}$

Here $\Sigma d^2 = 572$

$N = 12$

Putting values in the formulae

$$\sigma = \sqrt{\frac{572}{12}}$$

$$= \sqrt{47.66}$$

$\sigma$ = 6.9 (Approx.)

If we want to do this question using short–cut method, then the computation is as follows

Formula is $\sigma = \sqrt{\frac{\Sigma d'^2}{N} - \left(\frac{\Sigma d'}{N}\right)^2}$

Let us assume that the assumed mean ($A$) of the given value is 20.

| **Obtained Marks (x)** | **Variation (d) from assumed mean (A) Here assumed mean = 20** | **Square of variation ($d'^2$)** |
|---|---|---|
| 10 | –10 | 100 |
| 12 | –8 | 64 |
| 14 | –6 | 36 |
| 16 | –4 | 16 |
| 18 | –2 | 4 |
| 20 | 0 | 0 |

Notes

| | | |
|---|---|---|
| 22 | +2 | 4 |
| 24 | +4 | 16 |
| 26 | +6 | 36 |
| 28 | +8 | 64 |
| 30 | +10 | 100 |
| 32 | +12 | 144 |
| $N = 12$ | $\Sigma d' = 12$ | $\Sigma d^2 = 584$ |

According to question—

$$\sigma = \sqrt{\frac{\Sigma d'^2}{N} - \left(\frac{\Sigma d'}{N}\right)^2}$$

$$\Sigma d'^2 = 584$$

$$\Sigma d' = 12$$

$$N = 12$$

$$\sigma = \sqrt{\frac{584}{12} - \left(\frac{12}{12}\right)^2} = \sqrt{48.66 - (1)^2}$$

$$= \sqrt{48.66 - 1} = \sqrt{47.66}$$

$$\sigma = 6.9 \text{ (Approx.)}$$

## (b) Discrete Series

*Example 5* The data shows score and their frequency as depicted below. Find the standard deviation.

| **Score** | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Frequency** | 1 | 0 | 0 | 2 | 1 | 2 | 3 | 2 | 3 | 4 | 6 | 8 | 7 | 5 | 2 | 1 | 3 |

**Solution—**

**Direct Method**

Formulae $\sigma = \sqrt{\frac{\Sigma\, fd^2}{N}}$

| **Score (*X*)** | **Frequency (*f*)** | ***f x x = fx*** | **Variation *d(x – M)*** ***M* = 11** | ***F x d = fd*** | ***fd*²** ***fd x d*** |
|---|---|---|---|---|---|
| 21 | 1 | 21 | 10 | 10 | 100 |
| 20 | 0 | 0 | 9 | 0 | 0 |
| 19 | 0 | 0 | 8 | 0 | 0 |
| 18 | 2 | 36 | 7 | 14 | 98 |

Notes

| | | | | | |
|---|---|---|---|---|---|
| 17 | 1 | 17 | 6 | 6 | 36 |
| 16 | 2 | 32 | 5 | 10 | 50 |
| 15 | 3 | 45 | 4 | 12 | 48 |
| 14 | 2 | 28 | 3 | 6 | 18 |
| 13 | 3 | 39 | 2 | 6 | 12 |
| 12 | 4 | 48 | 1 | 4 | 4 |
| 11 | 6 | 66 | 0 | 0 | 0 |
| 10 | 8 | 80 | –1 | –8 | 8 |
| 9 | 7 | 63 | –2 | –14 | 28 |
| 8 | 5 | 40 | –3 | –15 | 45 |
| 7 | 2 | 14 | –4 | –8 | 32 |
| 6 | 1 | 6 | –5 | –5 | 25 |
| 5 | 3 | 15 | –6 | –18 | 108 |
| $N\ (\Sigma f) = 50$ | | $\Sigma fx = 550$ | | $\Sigma fd^2 = 612$ | |

Arithmetic mean, $M = \sqrt{\frac{\Sigma fx}{N}}$

$\Sigma fx = 550, \quad N = 50$

$M = \frac{550}{50}$

$M = 11$

Standard deviation $\sigma = \sqrt{\frac{\Sigma fd^2}{N}}$

$\Sigma fd^2 = 612, \quad N = 50$

$(\sigma) = \sqrt{\frac{612}{50}}$

$(\sigma) = \sqrt{12.4}$

$\sigma = 3.5$ (Approx.)

Solving by using short-cut method

Formula

$$(\sigma) = \sqrt{\frac{S\, fd'^2}{N} - \left(\frac{\Sigma\, fd'}{N}\right)^2}$$

Let us consider that the given scores have an assumed mean ($A$) = 10.

Notes

| Score ($x$) | Frequency ($f$) | Variation d′ of scores from Assumed Mean $A$ = 10 | $F$ x $d'$ = $fd$ | F d′ x d′ |
|---|---|---|---|---|
| 21 | 1 | 11 | 11 | 121 |
| 20 | 0 | 10 | 0 | 0 |
| 19 | 0 | 9 | 0 | 0 |
| 18 | 2 | 8 | 16 | 128 |
| 17 | 1 | 7 | 7 | 49 |
| 16 | 2 | 6 | 12 | 72 |
| 15 | 3 | 5 | 15 | 75 |
| 14 | 2 | 4 | 8 | 32 |
| 13 | 3 | 3 | 9 | 27 |
| 12 | 4 | 2 | 8 | 16 |
| 11 | 6 | 1 | 6 | 6 |
| 10 | 8 | 0 | 0 | 0 |
| 9 | 7 | –1 | –7 | 7 |
| 8 | 5 | –2 | –10 | 20 |
| 7 | 2 | –3 | –6 | 18 |
| 6 | 1 | –4 | –4 | 16 |
| 5 | 3 | –5 | –15 | 75 |
| $(N\Sigma f)$ = 50 | | $\Sigma fd'$ = 50 | | $\Sigma fd'$ = 662 |

$$(\sigma) = \sqrt{\frac{\Sigma d'^2}{N} - \left(\frac{\Sigma d'}{N}\right)^2}$$

$\Sigma fd'^2$ = 662,

$\Sigma fd'$ = 50 $N$ = 50

$$(\sigma) = \sqrt{\frac{662}{50} - \left(\frac{50}{50}\right)^2}$$

$$= \sqrt{13.24 - 1}$$

$$= \sqrt{12.24}$$

= 3.5 (Approx.)

## (c) Continuous Series

*Example 6* The given table shows the distribution of population for different age groups in a city. Find out the standard deviation (S.D.)

Notes

| Age Group | Number (in thousands) |
|---|---|
| 0–10 | 18 |
| 10–20 | 16 |
| 20–30 | 15 |
| 30–40 | 12 |
| 40–50 | 10 |
| 50–60 | 5 |
| 60–70 | 2 |
| Above 70 | 1 |

**Solution using Direct Method —** In direct method, we have to convert the continuous series into discrete series.

For this, we calculate the mid–points of the given class–intervals and then use the formula $\sigma = \sqrt{\frac{\Sigma\, fd^2}{N}}$.

| Age Group C.T. | Centre value of Class–Intervals ($x$) | Frequency ($f$) | $B \times x$ | Variation of Centre values of Class–Intervals from Mean $d$ = 27 | $fd = f \times d$ | $fd^2 = fd \times d$ |
|---|---|---|---|---|---|---|
| 0–10 | 5 | 18 | 90 | –21 | –378 | 7938 |
| 10–20 | 15 | 16 | 240 | –11 | –176 | 1926 |
| 20–30 | 25 | 15 | 375 | –1 | –15 | 15 |
| 30–40 | 35 | 12 | 420 | +9 | 108 | 972 |
| 40–50 | 45 | 10 | 450 | +19 | 190 | 3610 |
| 50–60 | 55 | 5 | 275 | +29 | 145 | 4205 |
| 60–70 | 65 | 2 | 130 | +39 | 78 | 3042 |
| 70 – 80 | 75 | 1 | 75 | +49 | 49 | 2401 |
| $N = (\Sigma f) = 79$ | | | $\Sigma fx' = 2055$ | | $\Sigma fd^2 = 24119$ | |

Mean value $(M) = \frac{\Sigma fx}{N} = \frac{2055}{79}$

$= 26$ (Approx.)

Standard deviation ($\sigma$) $\sigma = \sqrt{\frac{\Sigma fd^2}{N}} = \sqrt{\frac{24119}{79}}$

$= \sqrt{305.30}$

$\sigma = 17.47$

**Solution using Short-Cut Method —** If the mean value is not an integer, and then value of variation is a decimal. So the calculation becomes cumbersome and there is a possibility of mistake. In such cases, we should use short-cut method to compute standard deviation. This can be illustrated as shown below.

Notes

*Example 7* Use the following table to compute the standard deviation

| Weight (in Pounds) | Number of People |
|---|---|
| 70–80 | 12 |
| 80–90 | 18 |
| 90–100 | 35 |
| 100–110 | 49 |
| 110–120 | 50 |
| 120–130 | 45 |
| 130–140 | 20 |
| 140–150 | 8 |

To solve this question using short-cut method, we will assume the centre–value of any of the class intervals to be the mean.

Let us say $\frac{110+120}{2}=115$ is the mean. Now we form the following table.

| **Weight (in Pounds)** ***C.I.*** | **Number of People** ***(f)*** | **Mid–Point of Class–Intervals** ***x*** | **Variation of Mid–Point from Assumed Mean** ***(X – A)*** | **Variation of (*d*) Mid–point from Assumed Mean 115 divided by class width** ***(X–A/i)*** | $f \times d = fd$ | $fd \times d = fd^2$ |
|---|---|---|---|---|---|---|
| 70–80 | 12 | 75 | –40 | –4 | –48 | 192 |
| 80–90 | 18 | 85 | –30 | –3 | –54 | 162 |
| 90–100 | 35 | 95 | –20 | –2 | –70 | 140 |
| 100–110 | 49 | 105 | –10 | –1 | –49 | 49 |
| 110 –120 | 50 | 115 | 0 | 0 | 0 | 0 |
| 120–130 | 45 | 125 | 10 | 1 | 45 | 45 |
| 130 –140 | 20 | 135 | 20 | 2 | 40 | 80 |
| 140–150 | 8 | 145 | 30 | 3 | 24 | 72 |
| $N = 237$ | | | | | $\Sigma fd = -112$ | $\Sigma fd^2 = 740$ |

Formula –

$$\sigma = i\sqrt{\frac{\Sigma fd^2}{N}-\left(\frac{\Sigma fd}{N}\right)^2} = 10\sqrt{\frac{740}{237}\left(\frac{-112}{237}\right)^2}$$

Notes

$$\sigma = 10\sqrt{3.12-(-\cdot 47)^2} = 10\sqrt{3.12-\cdot 211}$$

$$\sigma = 10\sqrt{2.909}$$

$$\sigma = 17 \text{ (Approx.)}$$

In the table for this question, the mid–point ($x$) of class–interval and the variation between the mid–point and the assumed mean are not required to be mentioned. It is only shown for better understanding of the readers.

## 18.9 Importance of Variability

The computation of variation plays a very important role in bringing statistical research to a realisable level. Mean, median and mode do not convey complete features of the values of elements and there is always a possibility that our knowledge may be doubtful. The role of variation in removing this doubt is worth mentioning. In reality, mean and variation are inseparable and one without another is always incomplete. The combined computation of mean and variation can only introduce us about the true situation. For example, when we calculate the per capita income of the citizens of a country, then we cannot have accurate information about the richness or poorness of that country. If there is a localization of income and property towards few rich people and these people become very wealthy, then the per capita income which we will calculate using some computation will be more than the real income of most of the citizens. Therefore, true knowledge about the real situation cannot be ascertained until we consider variation. Hence, mean is incomplete without variation.

## 18.10 Summary

- Variation or dispersion is that quality which tells us the measure of deviation of a set of values from its mean (or average of values).
- Measures of variation are of four types– (a) Range (b) Quartile Deviation (c) Mean Deviation (d) Standard Deviation
- Mean deviation is the arithmetic mean of the mean and the elements of series.

## 18.11 Keywords

1. **Standard Deviation:** In order to eliminate the positive and negative signs of variation, the variation is squared to calculate the Standard deviation.

## 18.12 Review Questions

1. What is meant by variation?
2. How is mean deviation calculated from arithmetic mean?
3. Give the formula for short–cut method to compute Standard deviation and what does standard Deviation signify? Explain.

## Answers: Self Assessment

1. Arithmetic means 2. Mean deviation 3. Deviation mean

Notes

## 18.13 Further Readings

*Books*

1. Methodology of social research–Sanjeev Mahajan, Arjun Publishing House.
2. Fundamental of Sociology–Dr. Ganesh Pandey, Arun Pandey, Radha Publications.

# Unit-19: Correlational Analysis: Test of Significance and Co-variance

Notes

CONTENTS



## Objectives

After studying this unit students will be able:

- To define the mutual relationship between the various categories of facts.
- Understand the kinds of correlation and various methods of measurements of correlation.

## Introduction

An objective of presentation of facts is to give a description briefly and specifically of various facts and to define their comparative state. These goals are also achieved through measurements of central tendency. Mean, median and mode are used for accurate measurements of their central tendencies and also give them a short form. But only by making short the gathered facts doesn't help to ease the analysis and result formation because by doing so we get absolute results which are not of much use for us. To make them more useful it is necessary to define the mutual relationships between the various categories of facts. The procedure of correlation fulfils the goal of this and before writing anything more in this direction, let us first understand the meaning of correlation.

## 19.1 Subject-Matter: What is Correlation?

Explaining the meaning of correlation, Prof. Katariya writes—We usually want to know what the relation between two inter-related categories is. It is commonly seen that when there is an increase

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in the demand of a product, its price also increases; the more it rains the greater is the production; increase in the currency rate increases the price; the height of children increases with the increase in their age and heat increases with increase in sunshine. From these examples it is clear that demand of a product and its price; rain and production; currency rate and price of a commodity; age and height and sunrays and heat have some or the other relationship among them because if there is a change in any one then it affects the other; therefore it is said that sometimes there is an inter-dependence between two categories of facts. The change or alteration in one category affects the other category. Two categories are as such related that any change in one category affects the other category i.e. any increase or decrease in one category leads to a change in other category in same or reverse direction and also they have a casual relationship among them then they are known as correlation.

From the above definition it is clear that to have mutual relationship between two state-categories only having mutual alterations is not sufficient but these alterations must be because of one another. If it is not as such then however the changes between the two variables or categories may seem to be related but they will not be correlated. In other words it can be said that, "If price of other variable changes because of the change in first variable, then the two variables can be said as correlated." If because of the increase in the prices of kerosene, the price of petrol also increases then due to casual relationship these two would be termed as correlated. But if the price of rice increases along with the increase in price of kerosene then this would not be termed as correlation because of the lack of casual relationship between the two.

That is why Prof. Elhans has written that correlation points towards such a relation between two variables in which a change in the price of one variable also changes the price of the other variable. This would become clearer after reading the definitions given by various scholars.

*Task* What is subject-matter correlation? Briefly describe.

## 19.2 Definitions of Correlation

According to Prof. King, "The casual relationship between two groups is known as correlation." In another place he has defined co-relation in different manner and writes, "if this truth is proven that in most of the areas two variables increase or decrease in same or opposite direction then we consider that a fact has been determined and there is a relationship between them. This relationship is termed as correlation.

*Notes* In the words of Prof. Bowley, "When two results are related such that any change in the first results in the change in the second, such that an increase or decrease in one results in a reverse increase or decrease in the second, or and the quantity of change in the first is equal to the second, then the two results are said to be co-related."

Conner has written, "When two or more results change into a relationship such that any change in the first results in a change in the second then they are said to be correlated."

## 19.3 Kinds of Correlation

Notes

Kinds of correlation can be described in two different ways-

**1. Positive and Negative Correlation**. According to Prof. Kataria, "When the two variables change in one direction then the correlation is said to be direct or positive. For example, if the price of a substance increases and the supply of the substance also increases then exists a positive correlation between them." The same thing has been described by Prof. Elhance in different words. He writes, "When the price of two variables increases or decreases in the same direction, for example, the increase in the price of any variable is related to the increase in the price of other variable and the decrease in the price of variable is related to the decrease in the price of other variable than the correlation is said to be positive. In opposite of this if the price of two variables increase or decrease in opposite direction, like the increase in price of variable is related to the decrease in the price of other variable and in the same way the decrease in the price of a variable is related to the increase in the price of another variable then the correlation is said to be negative." In other words, "If two variables change in opposite direction instead of same direction then their correlation is said to be indirect or negative."

*Did You Know?* The increase in the price of a substance results in a decrease in its demand. In this way demand and price have a negative correlation.

**2. Linear and Non-linear Correlation.** Explaining the meaning of these Prof. Elhance writes, "When there is a constant ration between the prices of two variables then it is said to be linear correlation. *i.e.,* if every time the price increases by 10% then the increase in supply by 20% proves linear relationship between the two. This can be shown in the form of a straight line. In financial and social data such type of relationship very rarely occurs, specifically in social facts the ratio between the changes in two variables is rarely constant. Thus there change cannot be shown on a straight line. This type of correlation is said to be curvilinear or non-linear correlation.

*Notes* In the words of Prof. Elahance, "Linear correlations are those in which there is a constant ratio between the related variables and non-linear correlations are those where such ratio increase and decrease."

## 19.4 Methods of Measurement of Correlation

The correlation between two or more categories can be found out with following techniques-

*(i)* Scatter Diagram
*(ii)* Correlation Graph
*(iii)* Coefficient of Correlation
*(iv)* Correlation table

## 19.5 Scatter Diagram or Dotogram

In this correlation is presented in the form of figures but the correlation is not in the form of exact numbers rather it is in the form of estimate. The technique to make this is similar to linear point

Notes

technique. In this one side $x$ category and the other side $y$ category is taken. After this the price of $x$ category and the price of $y$ category are shown in the form of dots. There is a distinct point for the two values of a term. In this way the number of points is equal to the pairs of items.

## 19.6 Correlation Graph

To know about correlation we also use graph. In this techniques both the $x$ and $y$ categories are shown on ordinate and the number, time are shown on vertical line and the place is shown on horizontal line. If the graphs of both the categories move in the same direction than correlation is said to be positive. But if reverse happens and the graphs of both categories moves in opposite direction than it is said to be negative correlation. If there is not much difference between the two categories then the graphs can be shown in the same scale and base line. If there is much difference between the two then it is necessary to use two different scales.

## 19.7 Coefficient of Correlation

To find the extent and degree of correlation between two variables then we need to count their coefficient of correlation. Many techniques can be used to find the coefficient of correlation but the Carl Pierson formula is most famous and popular.

### Self Assessment

Fill in the blanks—

1. In this correlation is _____ in the form of figures but the correlation is not in the form of exact numbers rather it is in the form of estimate.
2. The technique to make this is similar to _____ point technique.
3. If the graphs of both the categories move in the same direction than it is said to be _____ correlation.

## 19.8 Summary

- Conner has written, "When two or more results change in to a relationship such that any change in the first results in a change in the second that they are said to be co-related."
- When the two variables change in one direction then the correlation is said to be direct or positive.
- If two variables change in opposite direction instead of same direction then their correlation is said to be indirect or negative."

## 19.9 Keywords

1. **Correlation—** If price of other variable changes because of the change in first variable, then the two variables can be said as correlated.
2. **Linear and Non-linear Correlation—** Linear correlations are those in which there is a constant ratio between the related variables and non-linear correlations are those where such ratios increase and decrease.

## 19.10 Review Questions

Notes

1. What is the meaning of correlation?
2. How many kinds of correlation exist?
3. Explain the various methods of measurement of correlation.

## Answers: Self Assessment

1. Presented 2. Point linear 3. Positive correlation.

## 19.11 Further Readings

*Books* 1. Social Research and Statistics—Ravindra Mukherjee.

2. Classical Social Contemplation—Agarwal Gopal Krishna, Bhatt Brothers.

Notes

# Unit-20: Writing a Research Report

CONTENTS



## Objectives

After studying this unit students will be able to:

- Understand the importance of research report writing
- Know about the preparation for research report writing.
- Know about the characteristics of a good report.

## Introduction

In research work, it is not just enough to gather heaps of data to know about the true meaning, cause and result pertaining to the subject under research until the data is arranged properly for analysis and description. It is necessary to properly analyse, describe the data and convert them into a written form in order that they become gems of research. It helps other researchers to study the same subject and re-examine the results. Also it facilitates them to make an outline of the social planning and improvement from the results and opinions. In order to fulfil these objectives, a complete written description of the survey research is done, which is known as a report.

## 20.1 Research Report Writing

Every social survey or research is based on the compiled data from scientific technological methods. But data alone cannot do anything until they are classified and summarised. Even classification and summarisation is insufficient until they are used to analyse and describe the data to arrive at scientific results. If these results become a resident of the brains of scientists and researchers, then there is no

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benefit to either science or anyone else. It is important that the complete survey and research-work objectives, area, used techniques and methods, description of compiled data, analysis and description, results and recommendations are properly documented so that they become gems of science, and other scientists can carry out research on the same subject to re-examine the results and prepare a outline of the social planning and reforms based on the results and recommendations.

*Notes* Towards the fulfilment of objectives, a written description of the complete research survey is prepared. This is known as survey or research report.

## 20.2 Objectives of Preparing the Report

Good and Hatt have written that research activity is very interesting and attractive for a scientist. But still at sometime it becomes necessary to prepare a report. In any type of study, there is always a stage after which it seems rather not useful to continue the research or carry out the analysis and description of compiled data. Sometimes, it happens that due to earlier agreed conditions, it is mandatory for the scientist or student to complete the research work within stipulated time frame and present the results. Moreover, the information and the new data obtained during research and survey is so interesting that the scientist is himself too excited to present the results to others. Finally, whoever has contributed in the research by explaining, recommending, helping or giving sufficient time are also very excited to know the results of their help and support. To fulfil these requirements, a report is prepared towards the end stages of the survey.

In this way, preparing report is the last stage of the survey, whose objective according to 'American Marketing Society' is, "To put forward in sufficient details the complete results of the study and to arrange the results in such a way that every reader is able to understand the data and verify the correctness of the results."

From the above statement, we can say that the primary objectives of preparing a report of a survey or research are as following-

1. **To Present Document of Knowledge—** Result of every survey or research is a source of the one or the other type of knowledge. It involves sufficient time, money and effort. Even after this, if the researcher restricts the knowledge to himself only, then the real usefulness of that knowledge itself vanishes and others also do not get benefit from this. Therefore, it is extremely important to give it a logically arranged written form so that it becomes a written document of knowledge and it becomes easier to conserve it as gem of science. Towards this objective, often a report of the survey or research is prepared.
2. **For the Extension of Knowledge—** This is also of not less importance towards preparing a report. We have already seen in the last section that analysis and description of the data not only facilitates clarity and results on research subject but also helps in finding out the other problems related to that subject which can be studied in detail later on. When a researcher documents his research-work and results, then he himself hints upon similar problems, new questions and subjects that may become subjects of research. In this way, reports help us to know about new topics in research and maintain the continuous expansion of knowledge.
3. **To Present the Result of the Investigation for other's Information—** It is important for a researcher to publish the results of his research for several reasons. **Firstly**, it is the duty of the researcher to present the results of his research to the concerned people or those

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interested in that field. For example, if the subject of research is of general interest, then it becomes necessary to inform the people of the results. **Secondly**, if some governmental or non-governmental action is dependent upon report, then it also gets pending until the preparation of the report. **Thirdly**, sometimes, government asks to research certain particular subject since it has to do certain related planning. To fulfil this objective, it is required to prepare report. F**ourthly,** every person who has contributed in the survey-work by putting effort, money, opinion, help and time is naturally interested to know about the results of the survey. Report is prepared towards their satisfaction as well. Apart from this, if the research is done for pursuing some degree or diploma, then the objective is not fulfilled unless a report is presented. For this also, a report is prepared. Finally, the new facts derived from the research are so interesting that the researcher himself wants to present the results to others and derive some self-pride from that. All the above six objectives are met by preparing a well documented report of the research.

4. **To Explain the Actual Conditions Involved—** The objective of report is not only to represent the results but also to present them in such a detailed and scientific manner so that the realities of different aspects of research-subject are self-explanatory and the reader is able to clearly understand the actual conditions involved and the inter-relationships. The success of research lies not only in being able to understand the subject but also in making others understand the subject. Towards this objective, the report is prepared in such a manner that people interested in the particular topic can benefit from reading it and can understand the new facts and social results from it.

5. **Test of Validity—** Until a research report is prepared, it cannot be validated whether the study is experimentally verified and genuine. Only after validating the report, it can be decided that the results are derived from original and actual material or from predictive and doubtful information. The classified data and results from the report become a general subject after publication (if the report is not kept secret by government). Therefore, if anyone doubts the correctness of the studies, then he/she can do research to verify and re-examine the results. This type of verification and re-examination either establishes the correctness of prior study or establishes the reputation of the science. Therefore, it is said that to be qualified to be validated and re-examined is one outstanding quality of scientific study. So, preparation of report also fulfils this objective.

## 20.3 Problems of Preparing the Report

Good and Hatt have rightly written, " Clearly, it appears that writing a report is a simple work because it a mere description of the questions asked, the techniques used to derive answers to the questions and the results developed in the last form. But in reality, this work may be hardly simple." In other words, preparing a research or survey report is not that simple as we may think it superficially. In reality, when the researches begins writing the report, he has to deal with various problems, a few of which are mentioned as follows-

1. **Problem of Language—** The biggest problem in preparing a report is the problem of language. The problem arises from the fact that if the language is made very simple, then the level of report is compromised and trivialness is reflected. But if the excessive use of scientific terms is made in order to raise the level of report, then it becomes very difficult and technical for most readers. In such scenario, it becomes problematic to determine the appropriate language for report because natural linguistic language degrades the level of the report while technical language restricts it from becoming popular. The real fact is that research is a complete phenomenon, wherein presentation of report is also included, and is itself a technical procedure which cannot be simplified after a certain defined level. It is not

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possible that technical words are not used in a report and it is also impossible to completely prevent the report from becoming hard to readers despite using technical words. Another problem that arises while writing report is that no such word or phrase shall be used that is ambiguous or casts a doubt in its meaning. If this happens, then there is always a possibility of developing a wrong notion about certain topics in the report. But in the complete study, it is not possible to be so careful about the language and there is always some element of language problem in one form or the other.

2. **Problems of Technical Words—** There has been outstanding progress in developing technical terms in natural sciences and there are plenty of words in these sciences whose meaning without any exceptions are same or understood to be same for everyone and everywhere. But in social sciences, this shortcoming is often experienced because in social sciences the use of standard technical terms is often not liked by writers. Not even that, technical vocabulary related principle differences is also not a less fascinating subject among social sciences and that different writers have hardly been able to keep themselves distant from certain positive or negative bias from this vocabulary. As we have already said above- presenting a report is also a technical subject and standard technical vocabulary cannot be completely avoided, therefore the lack of this vocabulary in social-sciences becomes a big problem because of which certain statements in the report become doubtful or ambiguous while researcher's real objective may not have been that.

   Until there is sufficient development of technical vocabulary in social sciences, the related problem in preparing reports will always be experienced.

## Self Assessment

Fill in the blanks:

1. The biggest problem in preparing a report is the problem of _____.
2. There has been _____ progress in developing technical terms in natural sciences.
3. Presenting a report is also a technical subject and standard technical _____ cannot be completely avoided.

3. **Problem of Intellectual Level of General Mass—** While writing the report, another problem develops regarding the intellectual level of general public, especially in those cases when the percentage of literate population is very less. Often the concept is presented that the research or survey-work is a serious subject so that the survey-report is not meant for common public. Many scholars reject this concept. They say that any scientific discovery, whether it is related to natural world or the social word, is not justifiable until the results of the discovery become an important part of the household because sometimes even a layman's interpretation is also very useful for the scientist. Sometimes the report is concerned with the general welfare and all related people take interest in it. So, the problem arises that the report-writer has to know the intellectual-level of the related people and this is not an easy job. If there is some mistake in the process, then the effectiveness of the report diminishes. For example, if some survey is related to worker class and the report is expected to benefit the workers, but if during the writing of the report, the intellectual level of workers is not kept into consideration, then many workers will not be able to really get benefit from the report because of the inability to understand the real recommendation in the report. But measuring the intellectual level accurately is itself a problem.

4. **Problems of Seriousness—** Every researcher has an intrinsic aspiration that his research report is of the level which makes him popular among high level readers and scholars. But

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if theresearcher is not able to maintain this aspiration at a reasonable level, then his report takes an unnecessary serious form. Unnecessary technical terms not only steal away the originality of the report but also the excessive technicality makes many aspects unclear. In reality, seriousness of thoughts and simplicity of language are two contrasting features that become a major problem in preparing a report.

5. **Problem of Concepts—** In a factual report, there is a problem associated with concepts. In reality, there is an acute shortage of concepts in social literature. Whatever we have today is not concept but a description of various situations. Using concepts, it is possible to express the complete situations in a few words and there is very little scope of doubt or haziness; but because there is still very less development of such concepts in social sciences, we have to unnecessary use detailed description for very ordinary situations wherein enough time and effort is unnecessarily lost.
6. **Problem of Objectivity—** This is a serious problem in preparing a report. Because the researcher is a part of that same unit of society whose one of the sides of its parts is being researched upon, so whatever he says regarding the study-subject is to some extent affected by his thinking, principles, values or attitude. He does not give the description of events on the basis of actual facts completely but also adds his own thoughts and feelings. This deforms the originality of the events. Apart from this, the researcher's own partiality and favour does affect his presented description and to be able to remain completely unbiased from these factors is possible for a very few researchers. As these factors creep into the report, the problem of objectivity arises.
7. **Problem of Expressing the Truth—** Sometimes the survey is related to subjects about which if everything is said in truth, then it is against the benefit or respect of a particular side. In such cases, the problem of expressing the truth arises itself; For example, if it is investigated regarding the senior government officers of the prevalent bribery and corruption, then the researcher is afraid of writing the truth in his report though he is aware of the poor situation because he knows that senior officers would either take revenge or he would become a victim of harsh government action. Therefore, he modifies the reality in his report. Sometimes, the research or survey reports of surveys conducted by the government are intentionally lost because if the truth in those reports is made public, it would tarnish the image of the government. In this way, numerous situations are there when there is a problem to express the truth.

## 20.4 Contents of the Report

The contents of the report refer to those topics whose description and explanation are commonly seen in a balanced report. Though all scholars are not unanimous with regard to these contents, still some common topics can be mentioned which are normally found in all reports.

These topics are as follows-

1. **Introduction—** In all reports, introduction is written first. Really, introduction helps in introducing the subject to the readers and contains the development of idea of research on the particular topic, the plan, importance and organization, etc. ideas in brief details. Similarly, introduction about the committee or department undertaking the research, introduction about the person or organization managing the research operation, selection of working members and their training, inspections during survey and information obtained are also mentioned in introduction. In introduction, information regarding time schedule and expense, etc. is also mentioned. During survey, the problems developed and the methods adopted to overcome or tackle those problems are also mentioned briefly in introduction. In introduction, the order of appearance of different topics and their description is also hinted. Finally, all persons,

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committees, societies and government departments who have helped or provided some opinion in the survey work are acknowledged in the introduction.

2. **Description of the Problem—** Firstly, a description about the subject of survey or research or its problem is provided. The background of the problem and the need to research the subject has to be described at the starting part of the report. On what basis was the problem selected and the expected principle and practical benefits under those circumstances of study of problem is also mentioned in this part of report. If there has been some earlier study on the same topic and if it has been there, then what is its relation with this study, etc facts are also clarified in this part of report. All these have the objective of clarifying the real state and limitations of the subject under study.

3. **Purpose of Study—** The objective of survey or research is either expanding the knowledge or getting some practical benefit. Therefore, it is mentioned in every report that the main aim of survey is to acquire the new knowledge or examine the established concept or study its details or get some practical benefit out of it. This needs to be remembered that if the survey is being organize by some commercial agency or government, then the researcher is informed well in advanc about the objectives of the survey and in accordance with that the limits of the survey are decided. But in such cases, the objective of the survey is to obtain any practical benefits. Whatever it is, the objectives of the survey are clearly mentioned in the starting of the report.

4. **Scope or Area of Study—** After writing about the problem and the objective, the scope of study is also described in the report. It includes giving introduction about the geographical area, social class or particular sect. Here, it is written about what sides of life or what sides of problems of life of particular sect, group or class are being studied. In this part of the report, brief introduction about a particular sect, group or class alongwith their natural, social, population and economics information is given to justify the selection of the particular topic as the research-subject. In other words, it is explained about the benefits and advantages obtained by narrowing the area of study in a particular way.

5. **Methods Employed—** All results of survey or research are dependent upon real facts and information. These facts and information are gathered. It is also mentioned in the reports about the different techniques and methods used to gather real facts and information related to the study-topic. The research writer can also write about the perspective in which the subject or problem was viewed and why certain techniques or methods were most appropriate in that perspective. Also a brief introduction about the sources of primary and secondary information is given along with the details about the methods employed to obtain information from those sources. If a questionnaire had been used, then the summarised information is presented in the report. If interview method has been adopted, then what principles were kept in mind while interviewing and whether interview guide was used or not, etc. information is also mentioned in the report. In a similar way, if certain measures and rules have been used, then they are also mentioned.

6. **Method of Selecting Samples—** Researcher also mentions the technique or method which is used in the selection of the sample in the presented study. Also, it is mentioned that how it was justified to use that particular method after knowing about the state of the subject i.e. it also discusses the reasons for selecting the particular method for selecting samples. Here, it is also described that whatever number of samples have been chosen, they are sufficient enough to represent the complete group. But if samples are not chosen and the census method is used for the complete population of the region, then this is also mentioned in the report.

7. **Organization of Survey—** In some reports, information regarding arranging and organizing the survey-work is not provided in the introduction but in a different manner. If the study–place examination method has been adopted, then how was the place or event chosen, how

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was the division of work done after training the workers, how was their work monitored, how was questionnaire gathered, how many hours per day was work carried out, how was gathered information checked for originality, how was compilation and codification of data done etc. information is mentioned in this part. The objective of this is to help people guess about the organization of the survey.

8. **Analysis and Interpretation—** After mentioning the above points, the report now comes to the most important juncture. At this juncture, the gathered information and data is presented in an arranged manner. Classification and tabulation of data provide real help in preparing this part because it is here where all obtained information, data; records are arranged in an attractive and useful format in the form of tables, charts, graphs, and plots to be represented. Not only are data just presented in a pleasant manner, but equally important analysis and descriptive explanation is also done. In the analysis, mainly work-cause relationship is clarified whereas in descriptive explanation the results and consequences are presented. The results of study are always presented in the form of factual data in explanatory way and it is also explaines the basis of these results and consequences. In order to make the report more interesting, lively and appropriate for statistical deduction, photos and graph-plots are also attached as and when the need is felt. If some secondary or derived material has been used, then using footnotes, brief introduction regarding their sources is provided.

9. **Highlights of Data—** In order to make the report more interesting and meaningful, after analysis and description an enclosed chapter is added wherein all the remarkable features of gathered data and the results derived after considering them as a basis are presented in a sequential manner so that the complete summary of the results of the study are available to the readers at a single place. In other words, this chapter contains the summary of the main results which clarifies the results of research in a summarised way.

10. **Suggestions—** If the research is done not solely for knowledge expansion and it is related to certain social problem or practical life, then towards the end of the report some creative suggestions are always provided. In these suggestions, how a problem should be solved practically or how a certain situation can be creatively improved is also answered. If the survey was organized by some organization or government agency for creative or improvement works, then it is very important to include the suggestions. The researcher does not dream of heaven on earth while presenting his suggestions i.e. he does not present suggestions that are not within the scope of available means and practicality. His suggestion is creative and practical in the sense that in the present circumstances, with the available resources in a nation or particular organization, he gives a clear idea about the maximum reform possible. For example, if he gives the suggestion that the dearness allowance of state government employees be made equal to that of the central government employees, then he also considers the fact whether the state government under present circumstances can afford to bear the additional expenses or not. If not, then upto what limit can the increase in dearness allowance be made practical and that the employee rights are also protected to the maximum. In brief, we can say that the suggestion should be useful, practical and also based on reason and should be creative. This point is often kept in mind by the researcher and should be kept ideally. These suggestions can be of two types—One those which are given during survey by the information-providers. These suggestions are very important because people living in a certain region or group for certain long duration, though not educated in principal concepts, have experienced the problem and therefore understand the problem in a practical way and so are capable enough to suggest useful ideas for improving the situation. So such suggestions are always mentioned in the report. Secondly, there are suggestions which researcher develops himself on the basis of his study. The usefulness of these suggestions depends upon the knowledge of the surveyor, experience, presence of mind and predictability.

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11. **Appendices—** The original report ends with the suggestions. However there are certain letters, articles, tables, charts, descriptions, etc. that help in proving the correctness of the study and therefore, it is considered appropriate to put them before readers. Such articles are put at the end of the report. In this, regional maps, bibliography, questionnaires, other lists, each copy of study tools, some important tables, etc. are included.

*Task* What is the meaning of the contents of the report? Explain briefly.

## 20.5 Characteristics of a Good Report

When concerned with the characteristics of a good report, there can be difference of opinion among great scholars because 'good-bad' concept is not same for everyone. Still, the task of survey and report preparation being a technical job, there can be certain baseline characteristics which define a good report. These characteristics are as follows-

1. **Attractive—** The outer appearance of a good report is pure and attractive. The report can be printed on good quality of white paper with clear and good fonts. Moreover, to make it even more attractive, good headings, diagrams, photos, pictures, etc. can also be used as needed.
2. **Balanced—** The language of report is extremely balanced. Technical vocabulary use has to be certainly made when needed. But in this matter, as Dr. Shyamcharan Dubey advises, the ultimate aim of writer is to clarify the subject and towards achieving that he does not favour any of the sides of the technical vocabulary-related principle differences. He also minds that he does not use too much of technical vocabulary to make it difficult and unbearable that one has to take expert's help to understand. On the other hand, the report should not feature very aggressive use of decorative and literature terms so that the originality of facts is lost and it should not be so much magnified in tone that the truth cannot be reliably expressed. Therefore, the tendency to make the report unbelievable and unoriginal by emphasising too much on language and style is avoided and it is prepared in a balanced language.
3. **Do not repeat—** In a good report, similar facts are not repeated because by doing this the reader tends to become bored of it. Facts are always arranged in a reasonable manner i.e. independently understood terms are introduced first and those terms that require some other terms for their meaning are mentioned later in the report.
4. **Scientific—** In a good report, the analysis and description of facts is in a very clear scientific format so that by reading the report, people will believe that whatever has been written in the report is not fictitious but factual and experimentally-proved. The sources of information are mentioned as foot-notes in every chapter of the report.
5. **Reliable—** In a good report, whatever results are produced are reliable, proven and ideal for scientific development. This means that in a report every result is presented in a factual way with evidences i.e. those reasons are also mentioned on which the result is based.
6. **Practicality—** In a good report, the element of practicality is also very clear i.e. a high-quality report is of the type wherein maximum people can benefit from reading it. From this type of report, we not only increase our knowledge but also we get practical benefit from it. A good report contributes in the planning of future-policies related to social development and social-reforms.

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7. **Mentioning the Sources of Information—** In a good report, the study-technique and methods, scope of study, sampling etc. is clearly explained in detail and all sources of information are mentioned. This is done with the objective that if someone has a doubt on the results of the study, then he/she can validate the results from the mentioned sources of information.
8. **Mention the Limits—** In a good report; a clear mention is made about the difficulties faced in study and the limits of survey. In other words, false claim regarding the complete reality of the study by hiding the shortcomings is not present. This is not done because of another reason that by honestly accepting the difficulties and shortcomings of the study, future surveyors are able to get prior information about to be cautious in relation to that and to plan to avoid them.
9. **To Develop the Concept—** In a high-quality report, there is always an attempt to develop the basic ideas and concepts. Also, future problems, subjects, questions are also hinted towards which future research or survey-work need to be done. This signal from every researcher who presents a report is very important.

## Self Assessment

Fill in the blanks:

4. When concerned with the characteristics of a good report, there can be difference of opinion among _____.
5. In a good report, similar facts are not _____ because by doing this the reader tends to become bored of it.
6. In a good report, the analysis and description of facts is in a very clear _____ format.

## 20.6 Importance of Report

Report is the summary of the complete study; hence its importance is recognized by all scholars. We can also mention its importance as follows-

1. Research or survey-report helps in publicising knowledge. A report has a complete knowledge database related to the study-topic and by reading the report, other people also acquire knowledge. A report not only contains information about the study-topic but also provides hints regarding other related subjects which are even more helpful in publicising knowledge.
2. A report can serve as a necessary imagination platform for new studies because by studying the survey-report, new ideas can develop and we also get to know about those questions and problems which can become topics of future research-work.
3. A report helps to get familiar with all the concerned study-works done in connection with the particular subject since a report contains information about previous works done in that field.
4. A report contains information about the techniques and methods used in the research. On this basis, a future researcher get help in selecting the techniques and methods for his research and this also make possible the discovery of latest research technology.
5. A report can become a basis for social progress and social reform. Many a times, to fulfil this objective, the government organises a survey and based on the report, it makes plans.
6. A report can prove useful to the hard-working common public also. Often surveys are conducted by government or private agencies regarding increasing the wages or improving

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the work conditions and based on the report, it is decided to increase the wages or the dearness allowance. Solutions for public related unwanted difficulties are also presented through reports and based on the reports; different measures are ensured to improve the situation.

*Did You Know?* Research or survey report helps in publicising knowledge, exploring new thoughts, guides for future research, suggests new solutions for different pathological problems in daily lives and can become a basis for implementation of plans and prosperity of public. It is only 'Report' which is a complete picture of the true knowledge, dedication and effort of a researcher.

## 20.7 Summary

- There is a stage after research when report has to be prepared. Report is the last stage of a survey.
- Report is the complete summary of the study. A 'Report' is a successful picture of the entire knowledge and effort of a researcher.
- In a good report, whatever results are published is proven, reliable and ideal for scientific development.

## 20.8 Keywords

1. **Validity of Scale—** Any research method or validity of scale is the capability to measure the facts accurately. In order to test the validity of scale, reasoning validity, known group method, independent norms methods etc. are used.

## 20.9 Review Questions

1. What are the objectives of preparing a report?
2. What are the problems encountered in preparing a report?
3. What are the characteristics of a good report?
4. What is the importance of a report?

## Answers: Self Assessment

1. Language
2. Outstanding
3. Vocabulary
4. Great scholars
5. Repeated
6. Scientific

## 20.10 Further Readings

*Books*

1. Shiksha ka Samajsastra-Tiwari-Sharda, Arjun Publishing House.
2. Vyavaharik Shodh ki Vidhiyan-Dr. Jay Bhagwan, Friends Publication (India).

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**Address:** N.H.-9, Delhi Road, Moradabad - 244001, Uttar Pradesh

**Admission Helpline No. :** 1800-270-1490

**Contact No. :**+ 91 9520 942111

**Email :** university@tmu.ac.in