MAR GREGORIOS COLLEGE OF ARTS & SCIENCE

Block No.8, College Road, Mogappair West, Chennai – 37

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PG DEPARTMENT OF SOCIAL WORK

SUBJECT NAME: SOCIAL WORK RESEARCH & STATISTICS

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PREPARED BY: PROF. D.ARUNKUMAR

UNIT 1

SCIENTIFIC INQUIRY

Meaning

Scientific inquiry is a way to investigate things and propose explanations for their observations. Data is gathered, hypothesis suggested and observations recorded. It is the process by which scientists ask questions, develop and carry out investigations, make predictions, gather evidence and propose explanations. The goal of a scientific inquiry is to obtain knowledge in the form of testable explanations that can predict the results of future experiments.

Definition

It can be defined as the scientific process of active exploration by which we use critical, logical and creative-thinking skills to raise and engage in questions of personal interests. Driven by our curiosity and wonder of observed phenomena, inquiry investigations usually involve

- Generating a question or problem to be solved
- Choosing a course of action and carrying out the procedures of the investigation
- Gathering and recording the data through observation and instrumentation to draw appropriate conclusions

SCIENCE

Meaning

The word Science is derived from Latin word scientiameans "knowledge". It is a systematic enterprise that builds and organizes knowledge in the form of testable explanations and prediction about the universe.

Definition

Science refers to a system of acquiring knowledge using observation and experimentation to describe and explain natural phenomena.

Nature and Characteristics

System – Science is a system of knowledge where so many facts are related together. It is a system of organized knowledge.

Empirical in Nature – Knowledge is obtained by observation. Verification plays an important role in science. Verification is based on the facts which we observe and experience.

Objective in Nature – the science takes facts in an impartial manner. It is neutral and free from prejudice.

Prediction – science can predict the happening of certain events.

ASSUMPTION

Assumption is nothing but a statement that is assumed to be true and from which a conclusion can be drawn.

SCIENTIFIC APPROACH TO INQUIRY – Scientific Method

The scientific method is a body of techniques for investigating phenomena, acquiring new knowledge, or correcting and integrating previous knowledge. To be termed scientific, a method of inquiry must be based on gathering observable, empirical and measurable evidence; subject to specific principles of reasoning. A scientific method consists of the collection of data through observation and experimentation and the formulation and testing of hypothesis.

Steps of Scientific Method

1. Ask a question
2. Do Background Research
3. Construct a Hypothesis
4. Test the Hypothesis with an Experiment
5. Analyze the data and draw a conclusion
6. Communicate the results

Overview of Scientific Method

SCIENCE AND STUDY OF SOCIAL PHENOMENA

- Social sciences investigate laws related to man or man s social behaviour.
- Social sciences proceed upon the assumption that man is the central figure.
- The fundamental elements of social sciences are psychologically related.
- The basic elements of social sciences are man, his mental states and behaviour.
- Social sciences provide lesser scope for measurement of subject matter.
- Objectivity is achieved with difficulty.
- Have less exactness, because of that social sciences can make fewer predictions.

CONCEPTS

Concepts are basic elements of scientific method. The concepts symbolize the empirical relationships and phenomena which are stated by facts. Concepts are used in understanding the phenomena or the aspects of phenomena which we are trying to understand or investigate.

CONSTRUCTS

Constructs (theoretical creations that are based on observations but which cannot be seen either directly or indirectly; things such as IQ, Leisure Satisfaction, Environmental Values, etc., are constructs

CONCEPTUAL DEFINITION

Also called as theoretical definition, gives the meaning of a word in terms of the theories of a specific discipline. A conceptual definition is an element of the scientific research process, in which a specific concept is defined as a measurable occurrence. It basically gives you the meaning of the concept. It is mostly used in fields of philosophy, psychology, communication studies. This is especially important when conducting a
content analysis.

E.g.: Weight: a measurement of gravitational force acting on an object Welfare officer is the one who looks after the well being of workers

OPERATIONAL DEFINITION

Also called as functional definition that explains how the variable is to be measured.

Operational definition precise descriptions about concepts employed in a study. An operational definition is a demonstration of a process – such as a variable, term, or
presence and quantity. E.g.: A result of measurement of an object on a Newton spring scale Welfare officer is the one who is appointed by NGO/Govt. to look after the well being
of employees, whom is called as social worker, personnel officer, etc.,

Difference between Conceptualization and Operationalization

Conceptualization Operationalization

- Theoretical
- Book based
- Planning oriented
- Popular view
- Abstract
- Practical
- Application based

 Specific

 Scientific view

 Concrete

VARIABLES

A characteristic, number, or quantity that increases or decreases over time, or takes different values in different situations is a variable. It is something that may be changed or manipulated during an experiment. Variable is any characteristic that may vary from person to person, place to place, time to time, case to case, situation to situation.

Definition

A variable is a characteristic of a unit being observed that may assume more than one of a set of values to which a numerical measure or a category from a classification can be assigned. E.g.: income, age, weight, etc., and occupation, industry, disease, etc.

Types of Variables

Independent variable

Dependent variable

Independent variable: that can take different values and can cause corresponding changes in other variables. It is typically the variable being manipulated or changed.

Dependent variable: that can take different values only in response to an independent variable. It is the observed result of the independent variable.

Eg: Age, Sex, Height

Measurement levels of variables

- Nominal
- Ordinal
- Interval
- Ratio

Nominal

This is allowed only for qualitative classification. onaming/classifying o no mathematical operations possible (except counting) Eg.: Players-Gender, race, color, city, etc.,

Ordinal

This is used to rank or order the variables in qualitative, but sometimes used

Quantitatively o ordered on some dimension o Boolean operations possible Eg.: Scales, Rank, Socio-economic status of the families

Interval

This is allowed to compare the differences between the variables in quantitative type ordered with equal intervals o addition, subtraction, and Boolean operations Eg.: IQ, Temperature

Ratio

This is used in quantitative classification o ordered, equal intervals, absolute and meaningful zero o all mathematical operations possible Eg.: Height, Age,time span, clients

4 Rules to be followed in all measurement of variables

- Variables must have at least 2 categories (they must vary)
- Categories must be distinct (that is, different)
- Categories must be mutually exclusive (the same person should not be able to fit into 2 categories of the 1 variable)
- Categories must be exhaustive (all the people being studied must fit into one of the categories; even if the category is □other□, every person should be assigned to acategory).

HYPOTHESIS

Meaning

The word Hypothesis is derived from Greek word Hypotithenai means to put under or to suppose. Hypothesis is a tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. Hypothesis is a tentative explanation of the research problem or a guess about the research outcome. Hypothesis is an assumption about relations between variables that is expressed as a statement

E.g., Adolescent males are more impulsive than adolescent females. juvenile delinquents are from BPL families

Definition

In the words of **George A Lundberg**, □Hypothesis is a tentative generalization, the validity of which remains to be tested□.

Hypothesis is a tentative statement asserting relationship between certain facts□- **Theodorson**

Nature

- It must accurately reflect the relevant sociological fact.
- It must not be in contradiction with approved relevant statement of other scientific
- disciplines
- It must consider the experience of other researchers. Example: Cause of poverty in village

Importance

- Hypothesis is inevitable in a thesis.
- Hypothesis provides an outline of the thesis written.
- Hypothesis supports the research to find an answer to a problem.
- It is expressed in declarative form.
- Hypothesis bridges the gap between theory and empirical inquiry.
- It does not matter if the hypothesis is positive or negative towards the research problem.
- It will provide a guideline to the problem.
- Hypothesis helps to check the validity of a theory.
- A hypothesis ensures the entire research process remains scientific and reliable.
- Hypothesis provides guidance to proceed on certain definite lines.
- Hypothesis helps in selecting pertinent factors.
- Hypothesis helps in drawing specific conclusions.

Functions

The functions of hypothesis are three fold:

- To test theories
- To suggest theories and
- To describe social phenomena

Uses

- Hypothesis states the purpose of the research.
- Hypothesis will give a plausible explanation that will be tested.
- Explains the future phenomenon that will need to be tested.
- Hypothesis supports the research to find an answer to a problem.

- Hypothesis bridges the gap between theory and empirical inquiry.
- It will provide a guideline to the problem.
- Give insight into the proposed research question.
- Helps to explain the focus and direction of the experiment or research.
- Hypotheses have been tested many times with accurate results, they become theories.

Criteria or Requirements of Hypothesis construction

- Should be measurable
- Should be testable with research or experimentation.
- Must use precise language.
- Needs to be logical.
- Should be developed directly from the experiences of the researcher;
- Should be concise, as a rule, no more than three hypotheses should be proposed forany given project;
- There should be a well-founded rationale for all proposed hypotheses.
- Provide alternative possibilities for the hypotheses that could be tested

Types

- Null Hypothesis
- Alternative Hypothesis
- Statistical Hypothesis
- Scientific Hypothesis
- Working Hypothesis

Null Hypothesis

The term was originally coined by English geneticist and statistician Ronald Fisher in 1935.

The null hypothesis typically corresponds to a general or default position. Null hypothesis states that there is no significant relation or difference between variables.

In null hypothesis there is no relationship between two measured phenomena or that potential treatment has no effect. The null hypothesis can never be proven. Data, such as the results of an observation or experiment can only reject or fail to reject a null hypothesis.

Examples:

Hyperactivity is unrelated to eating sugar.

All daisies do not have same number of petals.

Eating greasy food does not cause pimples

Alternative Hypothesis

It is devised by Jerzy Neymanand Egon Pearson.

The hypothesis which is accepted when the null hypothesis has been rejected is called alternative hypothesis. The alternative hypothesis, as the name suggests, is the alternative to the null hypothesis: it

states that there is some kind of relation.

Examples:

Hyperactivity is related to eating sugar.

All daisies have the same number of petals.

Eating greasy food causes pimples.

Statistical Hypothesis

A statistical hypothesis is a method of making decisions using data, whether from a controlled experiment or an observational study (not controlled). Statistical hypothesis tests answer the question that the null hypothesis is true□. In statistical hypothesis testing, two hypotheses are compared, which are called the null

hypothesis and the alternative hypothesis.

Scientific Hypothesis

It refers to a trial solution to a problem as a hypothesis, often called an "educated guess" because it provides a suggested solution based on the evidence. Experimenters may test and reject several hypotheses before solving the problem. A scientific hypothesis is based on experiments and observations from the past that cannot be explained with current theories.

Working Hypothesis

A working hypothesis is a hypothesis that is provisionally accepted as a basis for further research. May produce a tenable (acceptable, rational or justifiable) theory, even if the hypothesis ultimately fails Like all hypotheses, a working hypothesis is constructed as a statement of expectations, which can be linked to exploratory research purpose in empirical investigation. It is often used as a conceptual framework in qualitative research

Testing of Hypothesis

Hypothesis testing is the process used to evaluate the strength of evidence from the sampleand provides a framework for making determinations related to the study or research.

RESEARCH

Meaning

Research – Re + Search = Again find out. It means re searching something new.

Research is a process to arrive at dependable solutions of the problems through a well – planned method i.e. Scientific Method

Definition

Research is defined as systematic investigation intended to add to available knowledge in a form that is communicable and verifiable.

SOCIAL RESEARCH

A Social research is the systematic method of discovering new facts or verifying old fact their consequences, inter relationships, casual explanations and the natural laws which govern them.

SOCIAL WORK RESEARCH

MEANING

Social work research may be defined as systematic investigation into the problems in the field of social work. The study of concepts, principles, theories underlying social work methods and skills are the major areas of social work research. It involves the study of the relationship of social workers with their clients; individuals, groups or communities on various levels of interaction or therapy as well as their natural relationships and functioning within the organizational structure of social agencies.

DEFINITION

Social Work research is the systematic, critical investigation of questions in the social welfare field with the purpose of yielding answers to problems of social work and of extending and generalizing social work knowledge and concepts. **Friedlander** (1957)

OBJECTIVES

- To achieve a better fit between human needs and welfare goals.

- To build knowledge for social work theory and practice
- To improve and enlarge the techniques of diagnosis and treatment in social workpractice
- To develop the efficiency to redefine the function of social work agency
- To appraise and measure the community□s needs for social work/service
- To produce knowledge that can be helpful in planning and executing social work
- programmes

FUNCTIONS

- To deal with social phenomena
- To discover new facts and verify old facts
- To establish causal explanation between various human activities and problems
- To understand old theories and to discover new theories
- Re-examines the special body of knowledge; concepts and theories
- In the area of social work practice it tries to evolve a systematic theory and valid concept
- To know the efficacy of different methods / interventions of social work
- To search for alternate innovative interventions and treatments
- Social work research concerns itself with the problems faced by social workers.
- It encompasses those questions which are encountered in social work practices orin planning or administering social work services which can be solved through

research and which are appropriate for investigation under social work auspices.

LIMITATIONS

- A balance between theory and application
- Over emphasis on quantitative and statistical analysis
- Methodology of research
- Interdisciplinary approach
- Scientific objectivity
- Social work practice is concerned with the micro-level practice, such as working with individuals, groups, or a community.
- Social work research has to take into consideration the limitations of micro leveldesign of study and techniques.

- Social work research is basically a practice based research in which mostly draws its inferences through inductive reasoning.

SCOPE OF SOCIAL WORK RESEARCH IN INDIA

- Control over social phenomena
- Helps in social planning
- Useful in prediction
- Creates social understanding
- Leads to social growth
- Contribute to human welfare
- Refinement in social work research methodology

The areas of social work research may be broadly categorized as follows:

1) Studies to establish identify and measure the need for service.
2) To measure the services offered as they relate to needs.
3) To test, gauge and evaluate results of social work intervention.
4) To list the efficacy of specific techniques of offering services.
5) Studies in methodology of social work.

Social work is a diverse profession, possible broad research areas could be:

- Community Development
- Community Health (Including Mental Health)
- Child Welfare
- Women Welfare
- Youth Welfare
- Aged Welfare
- Welfare of SC & ST Groups
- Poverty Alleviation
- Physical and Mental Disabilities
- Juvenile Delinquency
- Crime and Correction etc.
- Management of Social Welfare Department and Organisation
- Disaster Management

 Industrial Social Work

 Issues concerning Advocacy and Networking

UNIT 2

RESEARCH DESIGN & SAMPLING

PROBLEM FORMULATIONS IN RESEARCH

BASIC RESEARCH QUESTIONS

Ask a question about something that you observe: How, What, When, Which, Why or Where?

Research Problem – Meaning

It involves laying down the limits within which the research work will be carried out keeping in view the determined objectives.

Mode of selection of a problem

- **Internal Criteria** – researcher's interest, competence, resource i.e. finance and time.
- **External Criteria** – research ability of the problem, importance and urgency, feasibility, socialrelevance, usefulness etc.

Sources of problems

 Books, articles, research reports, academic experiences i.e. lectures, seminars, discussions etc.

 Life experiences

 Field visits, internship training

 Intuition of the researcher

Meaning of formulation

Translating and transforming the selected research problem into a scientifically researchable question.

Three principle components in problem formulation are

 The originating question

 The rationale

 The specifying question

Importance of formulation

 Gives direction and specific focus to the research effort

 Helps to delimit the field of enquiry by singling out the pertinent facts

 Prevents blind search and indiscriminate gathering of data

 Helps the researcher to save time and energy to plan and execute other steps

 To identify the exact data and information required for the study

RESEARCH DESIGN

A Research design encompasses the methodology and procedure employed to conduct scientific research.

Meaning of Research Design

 It is a logical and systematic plan prepared for directing a research study.

 It constitutes the blueprint for the collection, measurement and analysis of data.

Features of Research Design

- It is a **plan** – specifies the objectives of the study and hypotheses to be tested.
- It is an **outline** – specifies the sources and types of information relevant to research question.
- It is a **blueprint** – specifying the methods to be adopted for gathering and analysing the data.
- It is a **scheme** – defining the domain in general i.e. generalizing to a larger population.

Factors affecting Research Design

 Degree of the formulation of the problem

 Topical scope-depth of the study

 Research environment

 Time dimension

 Mode of data collection

 Manipulation of variables under study

 Nature of relationship among variables

Evaluation of research design

Minimum of error

Personal bias should be minimized

Maximize accuracy and reliability of results

Yield maximum information

Minimum, cost and time

Flexibility

TYPES OF RESEARCH DESIGN

EXPLORATORY

An exploratory design is conducted about a research problem when there are few or no earlier studies to refer to. It is the process of exploring and diagnosing the facts, causes and reasons for the problem. The focus is on gaining insights and familiarity for later investigation or undertaken when problems are in a preliminary stage of investigation. The goals of exploratory research are intended to produce the following possible insights:

 Familiarity with basic details, settings and concerns.

 Well grounded picture of the situation being developed.

 Generation of new ideas and assumption, development of tentative theories or hypotheses.

 Determination about whether a study is feasible in the future.

 Issues get refined for more systematic investigation and formulation of new research questions.

 Direction for future research and techniques get developed.

What do these studies tell?

 Design is a useful approach for gaining background information on a particular topic.

 Exploratory research is flexible and can address research questions of all types (what, why, how).

 Provides an opportunity to define new terms and clarify existing concepts.

 Exploratory research is often used to generate formal hypotheses and develop more precise research problems.

 Exploratory studies help establish research priorities.

What these studies don't tell?

 Exploratory research generally utilizes small sample sizes and, thus, findings are typically not generalised to the population at large.

 The exploratory nature of the research inhibits an ability to make definitive conclusions about the findings.

 The research process underpinning exploratory studies is flexible but often unstructured, leading to only tentative results that have limited value in decision-making.

 Design lacks rigorous standards applied to methods of data gathering and analysis because one ofthe areas for exploration could be to determine what method or methodologies could best fit theresearch problem.

 DESCRIPTIVE

Descriptive research designs helps to provide answers to the questions of who, what, when, where, and how associated with a particular research problem A descriptive study cannot conclusively ascertain answers to why. It is the process of describing the facts, causes objectively without any bias. Descriptive research is used to obtain information concerning the current status of the phenomena and to describe "what exists" with respect to variables or conditions in a situation.

What do these studies tell?

- Descriptive research is often used as a pre-cursor to more quantitatively research designs, thegeneral overview giving some valuable pointers as to what variables are worth testingquantitatively.
- Descriptive studies can yield rich data that lead to important recommendations.

What these studies don't tell?

- The results from a descriptive research cannot be used to discover a definitive answer or todisprove a hypothesis.
- Because descriptive designs often utilize observational methods [as opposed to quantitativemethods], the results cannot be replicated.
- The descriptive function of research is heavily dependent on instrumentation for measurementand observation.

EXPERIMENTAL

- A blueprint of the procedure that enables the researcher to maintain control over all factors that mayaffect the result of an experiment.
- It is a scientifically sophisticated technique, capable of providing precise answers to precise problems.
- Control, manipulation, observation and replication are the 4 essential features. In doing this, theresearcher attempts to determine or predict what may occur.
- Experimental Research is often used where there is time priority in a causal relationship (cause precedeseffect), there is consistency in a causal relationship (a cause will always lead to the same effect), and themagnitude of the correlation is great.
- The classic experimental design specifies an experimental group and a control group. The independentvariable is administered to the experimental group and not to the control group, and both groups aremeasured on the same dependent variable.

Classification

- After-only
- Before-after
- Ex-post Facto
- Panel Study

What do these studies tell?

 Experimental research allows the researcher to control the situation.

 Permits the researcher to identify cause and effect of relationships between variables and to distinguish placebo effects from treatment effects.

 Experimental research designs support the ability to limit alternative explanations and to infer direct causal relationship in the study.

What these studies don't tell?

 The design is artificial, and results may not generalize well to the real world.

 The artificial settings of experiments may alter subject behaviours or responses.

 Experimental designs can be costly if special equipment or facilities are needed.

 Some research problems cannot be studied using an experiment because of ethical or technical reasons.

 Difficult to apply ethnographic and other qualitative methods to experimental designed research studies.

 CASE STUDY

In a case study, one single unit is extensively studied which can be a case of a person, organization, group or situation. Researcher investigates intensively to gather pertinent information which will provide valuable insight of social phenomena. ***Bell*** (1999) states "a case study approach is particularly appropriate for individual researchers because it gives an opportunity for one aspect of a problem to be studied in some depth within a limited time scale".A case study is an in-depth study of a particular research problem rather than a sweeping statistical survey. It is often used to narrow down a very broad field of research into one or a few easily researchable examples. The case study research design is also useful for testing whether a specific theory and model actually applies to phenomena in the real world. It is a useful design when not much is known about a phenomenon.

What do these studies tell?

Approach excels at bringing us to an understanding of a complex issue through detailed contextual analysis of a limited number of events or conditions and their relationships.

A researcher using a case study design can apply a variety of methodologies and rely on a variety

of sources to investigate a research problem.

Design can extend experience or add strength to what is already known through previous research.

Social scientists, in particular, make wide use of this research design to examine contemporary

real-life situations and provide the basis for the application of concepts and theories and extension of methods.

The design can provide detailed descriptions of specific and rare cases.

Interpretation of the findings can only apply to one particular case.

What these studies don't tell?

A single or small number of cases offers little basis for establishing reliability or to generalize the findings to a wider population of people, places, or things. The intense exposure to study of the case may bias a researcher's interpretation of the findings. Design does not facilitate assessment of cause and effect relationships. Vital information may be missing, making the case hard to interpret. The case may not be representative or typical of the larger problem being investigated.

SOCIAL SURVEY

This can also be known as field study method which aims at discovering relationships existing among social institutions.

UNOBTRUSIVE RESEARCH STRATEGIES

In unobtrusive research, researchers do not have direct contact with people. Therefore, subjects' behaviour is not affected by the research itself.

CONTENT ANALYSIS

In content analysis, researchers examine a class of social In content analysis, researchers examine a class of social artifacts, typically written documents. artifacts, typically written documents. Any form of communication Any form of communication - books, magazines, speeches, poems, newspapers, magazines, speeches, poems, newspapers, laws, and constitutions, etc. laws, andconstitutions, etc. ,, Answering "who says what, to whom, why, Answering "who says what, to whom,why, how and with what effect?"

Merits

 Economy of time and money.

 Easy to repeat a portion of the study if necessary.

 Permits study of processes over time.

 Researcher seldom has any effect on the subject being studied.

 Reliability.

Demerits

 Limited to the examination of recorded communications.

 Problems of validity are likely.

EXISTING DATA ANALYSIS

Many governmental and other agencies collect official or quasi-official statistics. Researchers use existing government statistics or published secondary data sets to conduct research. Quantitative analysis where good existing data sets exist

Merits

 Efficiency - time and money „

 Unobtrusive „

 Government data usually have very good sampling design

Demerits

 The data may not reflect a particular measure or a particular question that a social scientist has constructed.

 Problem with reliability: Reliability is dependent on the quality of the statistics

HISTORICAL ANALYSIS

Historical/comparative analysis is a qualitative method is is a qualitative method in which a researcher attempts to use historical records in which a researcher attempts to use historical records to master many subtle details. The purpose of a historical research design is to collect, verify, and synthesize evidence from the past to establish facts that defend or refute your hypothesis. The main purpose is to arrive at an accurate account of the past to gain a clearer perspective of the present. It uses secondary sources and a variety of primary documentary evidence, such as, logs, diaries, official records, reports, archives, and non-textual information [maps, pictures, audio and visual recordings]. The limitation is that the sources must be both authentic and valid.

What do these studies tell?

 The historical research design is unobtrusive; the act of research does not affect the results of the study.

 The historical approach is well suited for trend analysis.

 Historical records can add important contextual background required to more fully understand and interpret a research problem.

 There is no possibility of researcher-subject interaction that could affect the findings.

 Historical sources can be used over and over to study different research problems or to replicate previous study.

What these studies don't tell?

 The ability to fulfill the aims of your research is directly related to the amount and quality of documentation available to understand the research problem.

 Since historical research relies on data from the past, there is no way to manipulate it to control for contemporary contexts.

 Interpreting historical sources can be very time consuming.

 The sources of historical materials must be archived consistently to ensure access.

 Original authors bring their own perspectives and biases to the interpretation of past events and these biases are more difficult to ascertain in historical resources.

 Due to the lack of control over external variables, historical research is very weak with regard to the demands of internal validity.

 It is rare that the entirety of historical documentation needed to fully address a research problem is available for interpretation therefore, gaps need to be acknowledged.

EVALUVATIVE DESIGN

Meaning

Evaluation is the systematic acquisition and assessment of information to provide useful feedback about some object. It is used to evaluate the pros and cons of developmental programmes.

Definition

Weiss defines evaluation as “the systematic assessment of the operation and/or the outcomes of a program or policy, compared to a set of explicit or implicit standards, as a means of contributing to the improvement of the program or policy”.

The focus of evaluation research is on evaluating an event and to make judgment about its usefulness. Evaluation research can be used to influence system design, development, and implementation. Process evaluation focuses on “what the program actually does”

Types

- Concurrent Evaluation
- Periodic Evaluation
- Terminal Evaluation

PARTICIPATORY RESEARCH DESIGN

Participatory design known before as ‘Cooperative Design’ is an approach to design that attempts to actively involve all stakeholders (E.g.: employees, partners, customers, citizens, end users) in the design process to help ensure that the product designed meets their needs and is usable.

QUALITATIVE RESEARCH

Qualitative Research is all about exploring issues, understanding phenomena and answering questions.Focus groups, in-depth interviews, content analysis, ethnography, evaluation and semiotics are among the many approaches that are used, but qualitative research in its most basic form involves the analysis of any unstructured data, including: open-ended survey responses, literature reviews, audio recordings, pictures and web pages. Qualitative researchers aim to gather an in-depth understanding of human behavior and the reasons that govern such behavior. The qualitative method investigates the why and how of decision making, not just what, where, when. Hence, smaller but focused samples are more often needed than large samples.

SAMPLING

Sampling is the process of getting information from only part of a larger group.

A sample is a portion selected from the population or universe. Sampling is the process of obtaining information regarding the entire research population or aggregate or totality by examining only a part of it. It is a picture in miniature to represent the larger whole, to enable the researcher to make a judgment or inference about the whole with the presumption that the sample data will provide valid and reliable conclusions. Sampling is not only typical to the field of science, rather in our day-to-day life, we take to such method. For example, a cook presses a few pods of boiled rice in the cooking pot to be able to know that it is

ready to be served. Similarly, while examining the quality of food grain one need not examine each and every grain contained in the bag. Rather an examination of a handful of grains gives the impression regarding the entire bag.

Population

Population refers to the total number of cases with a given characteristic or characteristics, or all the members of a given set or class.

Universe

Universe constitutes all the individuals, things, events, documents or observations either on a single or many individuals etc. belonging to designated category characterizing specific attribute which a particular study should principally cover.

Characteristices

According to ***Prof. R.A Fisher*** has summed up the advantages of sampling over census in just four words, such as speed, economy, adaptability and scientific approach.

(a) Greater Speed: Speed emphasizes use of less time for collection of data as an universe in miniature is to be inspected and examined. Less time is consumed not only in the conduct of sampling inquiry, but also in the processing, editing, and analysis of data. As such, adoption of sampling method becomes absolutely necessary where the results are urgently needed.

(b) Reduced Cost: The sampling method involves reduction of cost of inquiry and as such this is much more economical than census method. Because of lack of finances the developing countries may not be able to afford to a complete census. The sample method will be of immense help in conducting socioeconomic surveys in those countries.

(c)Administrative Convenience: When small samples are used, the researcher finds it easy to give more attention to each return and to check their accuracy. Since a complete census requires a huge administrative setup involving large number of personnel, trained investigators and moreover proper coordination between various operating agencies, the organization and administration conducting a sample survey is in a relatively more convenient position. Contrary to the census method the sample survey requires less number of personnel or trained investigators and smaller field of inquiry.

(d)Reliability: A carefully designed and scientifically executed sample survey always yields more reliable results than those obtained on the basis of a complete census survey due to the following reasons:

(i) It is always possible to determine the sampling errors and thereby ascertain the degree of reliability ofthe results through the use of different devices. *{ii)* In a sample survey the non-sampling errors can beeffectively controlled and minimized by:

(a) Engaging sufficiently qualified, skilled and trained personnel.

(b) Providing proper training to the field investigators.

(c) Adequate accuracy.

*(d)*Utilizing refined equipments and developed statistical techniques and processing and analyzing the relatively limited data.

(e) By ensuring the follow up work in case of non-response and incomplete response.

On the other hand, in case of a complete census, the non-sampling errors caused due to measuring and recording of observations, inaccuracy and incompleteness of information, location of unity, incomplete response, non-responses, training of investigators, interpretation of questions, bias of investigator etc. appear to be more serious.

(ii) The effective reduction of non-sampling errors in a sample survey more than compensates errors in the estimates due to sampling procedure. Therefore, the results, it provides become more accurate and reliable ones.

*(iii)*Sampling procedure has also got an edge over the census method in the sense that the efficiency of

sampling procedure lies in the accuracy of result at par with the complete census by the use of some type of sampling check procedures.

(e)Wider Scope: Although it generally appears that a complete census can only provide detailed information due to its coverage of all the units in the universe, nevertheless, sampling procedure results in considerable saving of time, money, labour power and simultaneously provides obtaining more detailed and exhaustive information of the limited number of units selected in the sample. Moreover, in many a case, a complete enumeration of the universe is well nigh impracticable. In such cases where the investigation requires adequately trained personnel and more sophisticated equipments for data collection, processing and analyzing the data, it is rather inconceivable. In those cases sampling procedure is readily adaptable.

(f)Suitable for infinite or hypothetical population:

Where the universe appears to be too large or infinite, the sampling procedure is the only means available to the investigator for estimating the parameters of a population. For example, the floating population in a fair can only be estimated by sampling method. In the analogous manner, in case of a hypothetical universe the sampling procedure is the only scientific technique or estimation of the parameters of the population. For example, in the problem of tossing a coin where the process may continue indefinitely a sampling procedure is more readily adaptable than census.

(g)Destructive testing: If in the course of inspection the units are affected adversely or destroyed, or in other words if the testing unit is destructive, the researcher is left with no other means than taking recourse to sampling procedure. In such cases, inspecting a representative sample can only be resorted to, in order to avoid complete census which will destroy all the items.

Principles

Sampling demands the exercise of great care, otherwise the results may be misleading.

If sample survey is not properly designed and carefully executed according to the principles, the results will lack in reliability and are more to be misleading. Therefore, ***F. Stephen*** says, "***Samples are like***

medicines, they can be harmful, when they are taken carelessly without knowledge of their effects"

(1) Every good sample should have proper levels with instructions about its uses. Unless sampling design is made perfect, it might lead to serious complication in the final result, whereas the omission of few units in case of a census survey may hardly matter. Incomplete response or non-response from even one or two units in a small sample might have tremendous impact on the findings.

(2) A careful sample survey necessitates the involvement of qualified skilled and more experienced personnel, proper supervision and relatively more sophisticated tools and statistical techniques for the planning and execution of the sampling skill and for the collection, processing and analysis of data. If the survey lacks in either of these or all, the findings of the sample survey may not be relied upon.

(3) Although, it is believed that a sample survey saves time, money and manpower, it may so happen that sometimes the sample survey might need more time, relatively more expenditure and manpower than a census survey. This happens so particularly when the sample size constitutes a large chunk of the research universe and when complicated weighted system is used.

(4) The researcher cannot resort to sampling procedure if he wants to get information about the entire universe *.i.e.* about each and every unit of the population. Moreover, as sampling procedure is well-nigh impossible when the population is too heterogeneous.

Methods/Types of Sampling

The two types of sampling are random sampling or probability sampling and nonrandom sampling or non probability sampling.

A **probability sampling** is one in which every unit in the population has a chance (greater than zero) ofbeing selected in the sample, and this probability can be accurately determined. The five types of random sampling techniques are simple random sampling, systematic sampling, stratified random sampling, cluster random sampling and multi stage random sampling.

Non probability sampling is any sampling method where some elements of the population have no chance of selection or where the probability of selection can't be accurately determined.

Random Sampling

Random sampling (or probability sampling) is a process whereby every sampling unit in a finite population has an equal chance of being selected or not selected for participation in a research study.

 Important in random sampling is that the chance of being included can be clearly calculated.

 For example, if we choose 500 persons from a 50,000 population the chance of being included is 1 in 100.

 Random sampling is statistically sounder than other types of sampling and is widely used by most major research organizations.

 Random sampling is analogous to putting everyone's name into a hat and drawing out several names.

 Each element in the population has an equal chance of occurring. While this is the preferred way of sampling, it is often difficult to do.

 It requires that a complete list of every element in the population be obtained.

 Computer generated lists are often used with random sampling.

Forms of Random Sampling

Simple random sampling

 Accomplished by the lottery method or by using random tables.

 The lottery method--every unit of the population is identified by a number disc or slip. They are well mixed and then the appropriate numbers of samples are chosen.

 Random Tables--these are tables produced for sampling where random numbers are given for populations.

 Both methods produce random selections that do not rely on human judgement.

 Practically, the use is restricted to small populations.

Systematic Sampling

Systematic or quasi-random sampling differs from random sampling in not giving equal probability of selection to all possible samples which could be taken from a population.

It is also widely used and offers the most practical approximation to random sampling.

This method entails calculating a sample interval as a starting point and then adding that interval to each succeeding number. It is not strictly random, the initial number is random but the successive ones are not.

Example of systematic sampling:

In a survey covering a population of 10,000 it may be decided to take a sample of 250.

The sampling interval will be 10,000/250=40. A randomly selected number between 1 and 40 is chosen (in our example we use 4). The sampling series then becomes 4, 44, 84, etc. until we reach 250 samples.

Stratified Random Sampling

Stratified sampling divides the population into groups called strata by some characteristic, not geographically. For instance, the population might be separated into males and females. A sample is taken from each of these strata using either random, systematic, or convenience sampling. This type of sampling may result in increasing the precision of the sample survey.

Clearly individuals are influenced by characteristics such as age, sex, income group, etc.

By dividing our samples into strata with similar characteristics we may be able assess their opinions more accurately.

Cluster Sampling

Cluster sampling is accomplished by dividing the population into groups -- usually geographically. These groups are called clusters or blocks. The clusters are randomly selected, and each element in the selected clusters is used.

This type of sampling is particularly useful where the populations under survey are widely dispersed, and it would be impractical to take a simple random sample. This method is attractive for cost reasons, but it also increases the size of the sampling error.

Multi-stage Sampling

Multi-stage sampling is used where populations are widely dispersed and interviewing would be difficult. Interviews can be concentrated in convenient areas.The selection process takes place in two or more stages until the final number of sampling units isreached.

Non-probability Sampling

Non-probability sampling occurs when human judgement is involved in the selection of sampling units. This method is not encouraged as the results can almost never be applied to the population in general. The only instances when this might be appropriate is in farm products or parts where you are certain that there is little variance in the whole.

Accidental Sampling

Accidental sampling (sometimes known as **grab**, **convenience** or **opportunity sampling**) is a type of non probability sampling which involves the sample being drawn from that part of the population which is close to hand. That is, a population is selected because it is readily available and convenient. It may be through meeting the person or including a person in the sample when one meets them or chosen by finding them through technological means such as the internet or through phone.

Quota Sampling

This is a form of judgement sampling where the biases from the non-probability method of selection are controlled somewhat by stratification, weighting, and the setting of quotas for each stratum. This type of sampling is used much by commercial researchers as it is very cost effective and easy to administrate.

Problems of Quota Sampling

Interviewers tend to be bias in who they choose to interview.

A disproportionate number of highly educated people and certain occupations tend to be more highly represented. These problems can cause the data to be invalid.

All efforts should be made to minimize these biases by closing controlling and supervising the research staff. Using random techniques eliminates these problems.

Advantages of Quota Sampling

Speed, economy, and administrative simplicity. Interviews can obtain sample units without unnecessary travelling. Administratively simple because it is independent of sampling frames.

Purposive Sampling

• This sampling selects information rich cases for in depth study. Size and specific cases depend on the study purpose.

• This is a sampling method in which elements are chosen based on purpose of the study.

• This may involve studying the entire population of some limited group or a subset of a population.

Judgemental Sampling

This is obtained according to the discretion of someone who is familiar with the relevant characteristics of the population.

Snowball Sampling

• This is a method in which a researcher identifies one member of some population of interest, speaks to him/her, and then asks that person to identify others in the population that the researcher might speak to.

• This person is then asked to refer the researcher to yet another person, and so on.

• Snowball sampling is very good for cases where members of a special population are difficult to locate.

Sampling Error

• Difference between the sample and the population

• Not answered

• Issues, answers not relevant to our study.

Errors in Testing of Hypothesis

In the procedure of testing of hypothesis, a decision is taken about the acceptance or rejection of null hypothesis. The possible decisions can be written in a tabular form.

Type I Error : Reject the null hypothesis H0 when it is true.

Type II Error : Accept the null hypothesis H0 when it is false.

UNIT – 3

DATA COLLECTION

SOURCES AND TYPES OF DATA

Data

Data are facts, figures and other relevant materials, past and present, serving as bases for study and analysis Data can be broadly classified into

Data pertaining to human beings

Data related to human beings consists of demographic and socio-economic characteristics of individuals, behavioural variables such as attitudes, opinions, awareness, knowledge, intentions etc.

Data pertaining to organizations

Organizational data consists of data relating to an organization□s origin, ownership, objectives, resources, functions, performance and growth

Data pertaining to territorial areas

Territorial data is related to geophysical characteristics, population, occupational pattern, infrastructure etc.

Sources of Data

Statistical Data can be classified into two categories i.e primary data and secondary data.

Primary Data

Primary Data is collected by the researcher himself/herself for the purpose of the research study. Primary data are first hand information which are collected afresh and for the first time, and thus happen to be original in character.

Secondary Data

Secondary Data are those which have already been collected by someone else and which have already been passed through the statistical process. The secondary data can be obtained from journals, reports, government publications, publication of professional and research organizations and so on.

Objective

It is collected through strictly controlled, unbiased scientific experimentation or polling.

Subjective

It implies on the element of opinion or personal feeling encoring into the test methods or result analysis.

Quantitative Data

Quantitative data is a numerical measurement expressed not by means of a natural language

description, but rather in terms of numbers. However, not all numbers are continuous and measurable. Example: the social security number is a number, but not something that one can add or subtract. Height = □1.8 m□.

Quantitative data always are associated with a scale measure.

Qualitative Data

Qualitative data is a categorical measurement expressed not in terms of numbers, but rather by means of a natural language description. In statistics, it is often used interchangeably with Categoricaldata.

Example: favorite colour = blue

When there is not a natural ordering of the categories, we call these nominal categories.

Example might be gender, race, religion or sport.

When the categories may be ordered, these are called ordinal variables. Categorical variables that judge size (small, medium, large, etc.,) are ordinal variables. Attitudes (Strongly disagree, disagree, neutral, agree, strongly agree) are also ordinal variables.

Primary Data and Methods of Data Collection

Observation

Observation involves recording the behavioural patterns of people, objects and events in a systematic manner. Observation is the basic method of obtaining information about social phenomena under investigation. It is the most commonly used method especially in studies relating to behavioural sciences. Under the observation method, the information is sought by way of investigators own direct observation without asking from the respondent.

Merits of Observation

1. Subjective bias is eliminated, if the observation is done accurately.
2. The information obtained under this method relates to what is currently happening.
3. Relatively less demanding of active cooperation on the part of respondents.

Limitations

1. It is an expensive method.
2. The information provided by this method is very limited.
3. Sometimes unforeseen factors may interfere with the observational task.
4. Some people are rarely accessible to direct observation.

Observational methods may be,

□ Structured or unstructured

□ Participant or non-participant

□ Disguised or undisguised

 Natural or contrived

Structured Observation

In case the observation is characterized by a careful definition of the units to be observed, the style of recording the observed information, standardized conditions of observation and the selection of pertinent data of observation, then the observation is called as structured observation. Structured observation is considered appropriate in descriptive studies.

In structured observation, the researcher specifies in detail what is to be observed and how the measurements are to be recorded. It is appropriate when the problem is clearly defined and the information needed is specified.

Unstructured Observation

When observation is done without any thought before observation then it is called as unstructured observation or when observation is to take place without the above mentioned characteristics which is to be thought of in advance, the same is termed as unstructured observation. In unstructured observation, the researcher monitors all aspects of the phenomenon that seem relevant. It is appropriate when the problem has yet to be formulated precisely and flexibility is need in observation to identify key components of the problem and to develop hypothesis. Thepotential for bias is high. **Observation findings should be treated as hypothesis to be testedrather than as conclusive findings.**

Participant Observation

If the observer observes by making himself, more or less, a member of the group he is observing so that he can experience what the members of the group experience, the observation is called as participant observation.

In participant observation, the researcher becomes, or is, part of the group that is being investigated. Participant observation has its roots in ethnographic studies (study of man and races) where researchers would live in tribal villages, attempting to understand the customs and practices of that culture. It has a very extensive literature, particularly in sociology (development, nature and laws of human society) and anthropology (physiological and psychological study of man). Organisations can be viewed as tribes with their own customs and practices. The role of the participant observer is not simple. There are different ways of classifying the role:

 Researcher as employee

 Researcher as an explicit role.

 Interrupted involvement.

 Observation alone.

Non-participant Observation

When the observer observes as a detached emissary without any attempt on his part to experience through participation what others feel, the observation of this type is often termed as non-participant observation.

The observer does not normally question or communicate with the people being observed. He or she does not participate.

Disguised Observation

In disguised observation, respondents are unaware that they are being observed and thus behave naturally. Disguise is achieved, for example, by hiding, or using hidden equipment or people disguised as shoppers.

Undisguised Observation

In undisguised observation, respondents are aware that they are being observed. There is a danger of the Hawthorne effect – people behave differently when being observed.

Natural Observation

Natural observation involves observing behavior as it takes place in the environment. Example: eating burgers in a fast food outlet.

Contrived Observation

In contrived observation, the respondents behavior is observed in an artificial environment. Example: a food tasting session.

Questionnaire

A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents.

Questionnaires are a popular means of collecting data, but are difficult to design and often require many rewrites before an acceptable questionnaire is produced.

(One to one, Mailed, Telephonic survey)

Mailed Questionnaire

In this method a questionnaire is mailed to the person concerned with a request to answer the questions and return the questionnaire. This method is most extensively applied in various researches of human and economic geography.

Merits

1. There is low cost even when the universe is large and is widespread geographically.

2. It is free from bias of interviewer as answers are respondent s own words.

3. Respondents, who are not easily approachable, can also be reached conveniently. Moreover,respondents are given enough time to give well thought answers.

Demerits

1. Low rate of return of the duly filled questionnaires.
2. It can be used only when the respondents are educated and cooperative.
3. The control of the questionnaire may be lost once it is sent.
4. It is difficult to know whether willing respondents are truly representative.
5. This method is likely to be the slowest of all.

Types of Questionnaires

1) Structured - non disguised questionnaire
2) Structured - disguised questionnaire
3) Non structured - non disguised questionnaire
4) Non structured - disguised questionnaire

1. **Structured non disguised questionnaire**

Questions are listed in a pre-arranged order Respondents are told about the purpose of collecting information

2) Structured- disguised questionnaire

Questions are listed in a pre-arranged order Respondents are not told about the purpose of conducting survey

3) Non structured non disguised questionnaire

Questions are not structured. Researcher is free to ask questions in any sequence he/she wants.

Respondents are told about the purpose of collecting information

4) Non structured disguised questionnaire

Questions are not structured Researcher is free to ask questions in any sequence he/she wants. Respondents are not told about the purpose of conducting survey.

Interview Schedule

A schedule is a set of questions with structured answers to guide an observer, interviewer, researcher or investigator. It is a plan or guide line for investigation. According to ***Thomas Carson***, the schedule is a list of questions or a set of questions formulated and presented with specific purpose for testing an assumption or hypothesis. Interviewing is a technique that is primarily used to gain an understanding of the underlying reasons and motivations for people□s attitudes, preferences or behavior. Interviews can be undertaken on a personal one-to-one basis or in a group.

Definition

Goode &Hatthas defined interview schedule as a set of questions which are asked by an Interviewer and filled in on the spot in a face to face interaction with another person.

P.V.Younghas defined interview schedule as a set of questions which are asked and filled in by the investigator himself.

Advantages

1. It leads to more response
2. Accurate information can be collected
3. It is free from biasness
4. Direct contact between the investigator and the respondent
5. More difficult situation can be studied
6. It is used for both literate and illiterate respondents.

Disadvantages

1. It is more expensive and costly
2. It is more time consuming
3. It requires skilled and experienced investigators

Difference between Interview Schedule and Questionnaire

Interview Schedule Questionnaire

Direct method of study Indirect method of study

Less area covers More area covers

No obligation on respondents Obligation over respondents

More expensive Less expensive

More reliable information Less reliable information

Details are possible Details are not possible

No gap between the interviewer and the interviewee

Gap between the interviewer and the interviewee

Interview – Definition

According to McNamara, 1999

 Interviews are particularly useful for getting the story behind a participant s experiences.

 The interviewer can pursue in-depth information around the topic.

 Interviews may be useful as follow-up to certain respondents.

Types of Interview

1. Personal Interview
2. Telephone Interview
3. Focus Group Interview
4. Depth Interview
5. Projective Techniques

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Personal Interview

1. In the personal interviews the interviewer asks questions generally in a face to face contact.
2. Through interview method more and reliable information may be obtained.
3. Personal information can be obtained easily under this method.
4. It is, however, a very expensive and time consuming method, especially when large and widely spread geographical sample is taken.
5. Certain types of respondents, such as officials, executives or people of high income groups, may not be easily accessible.
6. In this method, the respondent may give wrong and imaginary information

Is a face to face two way communication between the interviewer and the respondents. Generally the personal interview is carried out in a planned manner and is referred to as structured interview. This can be done in many forms e.g. door to door or as a planned formal executive meeting.

Methods of conducting an Personal Interview

A personal interview involves a lot of preparation. Generally an personal interview should go through the following five/5 stages they are as follows.

A. Rapport building

Interviewer should increase the receptiveness of the respondent by making him believe that his opinions are very useful to the research, and is going to be a pleasure rather than an ordeal.

B. Introduction

An introduction involves the interviewer identifying himself by giving him his name, purpose and sponsorship if any. An introductory letter goes a long way in conveying the studylegitimacy.

C. Probing

Probing is the technique of encouraging the respondents to answer completely, freely and relevantly.

D. Recording

The interviewer can either write the response at the time of interview or after the interview. In certain cases, where the respondent allows for it, audio or visual aids can be used to record answers.

E. Closing

After the interview, interviewer should thank the respondent and once again assure him about the worth of his answers and the confidentiality of the same.

Telephonic Interview

In telephonic interviews contact is made with the respondents through telephone.

Telephone interview the information is collected from the respondent by asking him questions on the phone is called as telephone interview. The combination of telephone and computer has made this method even more popular.

Merits

1. It is more flexible and faster than other methods.
2. It is cheaper and less time consuming.
3. Recall is easy and replies can be recorded without causing embarrassment to respondents.
4. At times, access can be made to respondents who otherwise cannot be contacted for one reason or the other.
5. No staff is required and wider representation of sample is possible.

Demerits

1. the surveys are restricted to respondents who have telephonic facilities
2. little time is given to respondents for considered answers.
3. It is not suitable for intensive surveys where comprehensive answers are required for various questions.

Focus Group Interview

Focus group interview is an unstructured interview which involves a moderator leading a discussion between a small group of respondents on a specific topic.

Focus group interview results in advantages summed up as 10 S. they as follow.

- Synergism
- Snowballing
- Stimulation
- Security
- Spontaneity
- Serendipity
- Specialization
- Scientific scrutiny
- Structure
- speed

Depth Interview

Depth interview is nondirective in nature where the respondent is given freedom to answer within the boundaries of the topic of interest.

Projective Techniques

Projective Techniques involve the presentation of an ambiguous, unstructured object, activity or person that a respondent is asked to interpret and explain.

In Projective Techniques, the respondents are asked to interpret the behaviour of others and this way they indirectly reveal their own behaviour in the same situation. Some of these techniques are discussed below.

- Word Association Test: Respondents are presented with a list of words one at a time and they are asked to respond immediately with the first things that come to their mind e.g. in a study on book reading habits the respondents can be presented with words like 2 states etc.
- Cloud Picture Test: This shows two or more character conversing with each other and cloud of one character is left empty as a response to be filled by the respondents according to his interpretation of what the other characters are saying.
- Sentence Completion Test: It is similar to a word association test where instead of a word, a sentence is left incomplete and the respondent is asked to fill it with the first thought that comes to his mind e.g. People who enter politics are……..
- Story Completion Study: A step further to sentence completion, is the story completion study: Under this a story is created by the researcher which defines the topic of research and the respondents are asked to complete the story.

Advantages of Interview method

1. **Opportunity for Feedback** – Interviewer can provide direct feedback to the respondent, give clarifications and help alleviate any misconceptions or apprehensions over confidentiality that the respondent may have in answering the interviewer's questions
2. **Probing Complex Answers** – Interviewers can probe if the respondent's answer is too brief or unclear. This gives interviewers some flexibility in dealing with unstructured questions and is especially suited for handling complex questions
3. **Length of Interview** – If the questionnaire is very lengthy, the personal interview is the best technique for getting respondents to cooperate, without overtaxing their patience
4. **Complete Questionnaires** – Personal ensures ensure that the respondent will answer all questions asked, unlike in telephone interview where the respondent may hang up or in mail questionnaire where some questions may go unanswered
5. **Props & Visual Aids** – Interviewers have the opportunity of showing respondents items such as sample products, graphs and sketches, which can aid in their answers
6. **High Participation** – Interviewing respondents personally can increase the likelihood of their participation, as many people prefer to communicate directly verbally and sharing information and insights with interviewers

Disadvantages of Interview method

1. **Cost** – Personal interviews are usually more expensive than mail, telephone and internet surveys. Factors influencing the cost of the interview include the respondents geographic proximity, the length and complexity of the questionnaire, and the number of nonrespondents
2. **Lack of Anonymity** – Respondents are not anonymous in a personal (face-to-face) interview and may be reluctant to disclose certain information to the interviewer. Hence, considerable must be expended by the interviewer when dealing with sensitive questions to avoid bias effects on the respondent's part
3. **Necessity for Callbacks**– When a person selected for interview cannot be reached the first time, a callback has to be scheduled which result in extra cost and time spent
4. **Variance Effects** – It has been shown that the demographic characteristics of the interviewer can influence the answers of the respondents. In one study, male interviewers had a much larger variance of answers than female interviewers in a sample of most female individuals
5. **Dishonesty** – Interviewers cheat to make their life easier and save time and effort
6. **Personal Style** – The interviewers individual questioning style, techniques, approach and

demeanor may influence the respondents answers

7. **Global Considerations** – Cultural aspects may influence peoples willingness to participate in an interview (e.g. repressive Middle Eastern cultures discourage females from being questioned by male interviewers)

Construction

Questionnaire construction or Interview schedule construction - It is a series of questions asked to individuals to obtain statistically useful information about a given topic. When properly constructed and responsibly administered, questionnaires become a vital instrument by which statements can be made about specific groups, or people, or entire populations.

Types of questions

1. **Contingency question** – A question that is **answered** only if the respondent **gives** a particular response to a previous question. This avoids asking questions of people that do not apply to them (for example, asking men if they have ever been pregnant).

2. **Matrix questions** - Identical response categories are assigned to multiple questions. The questions are placed one under the other, forming a matrix with response categories along the top and a list of questions down the side. This is an efficient use of page space and respondents time.

3. **Closed ended questions** - Respondents answers are limited to a fixed set of responses. Most scales are closed ended. Other types of closed ended questions include:

o**Yes/no questions** - The respondent answers with a "yes" or a "no".

o**Multiple choice** - The respondent has several options from which to choose.

o**Scaled questions** - Responses are graded on a continuum (example: rate the appearance of the product on a scale from 1 to 10, with 10 being the most preferred appearance). Examples of types of scales include the Likert scale, semantic differential scale, and rank-order scale (See scale for a complete list of scaling techniques.).

4. **Open ended questions** - No options or predefined categories are suggested. The respondent supplies their own answer without being constrained by a fixed set of possible responses. Examples of types of open ended questions include:

o**Completely unstructured** - For example, "What is your opinion on questionnaires?"

o**Word association** - Words are presented and the respondent mentions the first word that comes to mind.

o**Sentence completion** - Respondents complete an incomplete sentence. For example, "The most important consideration in my decision to buy a new house is...

o**Story completion** - Respondents complete an incomplete story.

o**Picture completion** - Respondents fill in an empty conversation balloon.

o**Thematic apperception test** - Respondents explain a picture or make up a story about what they think is happening in the picture

Question sequence

 Questions should flow logically from one to the next.

 The researcher must ensure that the answer to a question is not influenced by previous questions.

 Questions should flow from the more general to the more specific.

 Questions should flow from the least sensitive to the most sensitive.

 Questions should flow from factual and behavioral questions to attitudinal and opinion questions.

 Questions should flow from unaided to aided questions.

Scaling Techniques / scales of measurement

Scaling

Scaling is the process of measuring or ordering entities with respect to quantitative attributes or traits.

1) **Nominal scale**: In this scale, numbers are only used as labels, they have no numerical sanctity. e.g To categorize male and female respondents we could say a nominal scale of 1 for male and 2 for female. Other examples could be to indicate categories of any variable which is not be given a numerical significance ---Religion--- Hindu—1, Muslim--- 2, Christian – 3 etc. Education level: H.S.C Pass--- 1, Graduate ---2, P.G--- 3 etc. Languages spoken: --- English--- 1, Marathi--- 2 etc.

2) **Ordinal scale:** Ordinal scale variables are ones, which have a meaningful order to them. e.g.: A typical marketing variable is ranks given to brands by respondents. These ranks are not interchangeable, as nominal scale labels are. This is because rank 1 is higher than rank 2 and so on. The distance between each rank is not known. Ranking simply denotes that rank 1 is higher than rank 2, rank 2 is higher than rank 3 , but by how much is unknown.

3) **Interval scale (Rating scale)** :Most of the behavioural measurement scales used to measure attitudes of respondents on a scale of 1 to 5 or 1 to 7 are interval scales. The difference between interval and ordinal scale variables is that the distance between 1 and 2 is the same as distance between 2 and 3 and so on.

4) **Ratio scale**: In a ratio type scale, there is a unique zero or beginning point. Interval scale does not have a unique zero. Also the ratio of two values of the scale corresponds to the same ratio among the measured values. e.g distance is a ratio scaled variable. Starting point is zero. 2 meters is to1 meter as 2km is to 1 km. Some of the common ratio scaled variables are--- age, height, length, weight and income.

Other Attitude scales

1) **Likert or agreement scale**: A statement or series of statements with which the respondent shows the amount of agreement/disagreement. e.gInorbit Mall is the most attractive Mall in Mumbai Strongly disagree disagree neither agree or disagree agree strongly agree

2) **Semantic differential scale**: A scale connecting two bipolar words, where the respondent selects the point that represents his/her opinion. e.g Indian Airlines Modern _ _ _ _ _ _ _ Old-fashioned Air hostesses Courteous _ _ _ _ _ _ _ Rude

3) **Importance scale** : A scale that rates the importance of some attribute e.g Airline food service to me is Extremely important very Important somewhat important Not very important Not at all important

4) **Intention** –to –buy scale: A scale that describes the respondents intention to buy. E.g If an inflight telephone service was available on along flight , I would Definitely buy Probably buy Not sure Probably not buy Definitely not buy.

5) **Projective techniques**

a)**Word association** : Words are presented , one at a time and respondents mention the first word which comes to their mind e.g :-- What is the first word which comes to your mind when you hear the following :Airlines : _____ Jet Airways:_____ Air Deccan :_____ Travel

:_____

b) **Sentence completion**: An incomplete sentence is presented and respondents complete the sentence .e.g when I choose my airline the most important consideration in my decision is _____.

c) **Story completion**: An incomplete story is presented and the respondents are asked to complete it

d) **Picture completion**: A picture of two characters is presented, eithone making a statement. Respondents are asked to identify with the other and fill in the empty balloon.

e) **Thematic Apperception test (TAT)**: A picture or a series of pictures is/are presented and therespondents are asked to make up a story about what they think is happening or may happen inthe picture.

Primary Data Collection – Merits

1. Targeted issues are addressed
2. Efficient spending for information
3. Unbiased information
4. More participation and reality
5. Greater control

Primary Data Collection – Demerits

1. Time consuming
2. High cost
3. Inaccurate feedback
4. Requires large amount of resources

Concept of Validity:

It refers to the truthfulness of a measure. Does it measure what it intends to measure?

Assessing validity:

Construct validity Extend to which it measure the theoretical construct it is designed to measure.

Convergent validity: Discriminant validity.

Concept of Reliability:

Reliability refers to the consistency of measurement. Reliable test should yield similar (consistent) results each time it is taken. Common method: test- retest reliability.

Factors affecting reliability:

- Number of items
- Variability
- Condition in which the questionnaire is administered

PRE-TEST

A **PRE-TEST** usually refers to a small-scale trial of particular research components.

A **PILOT STUDY** is the process of carrying out a preliminary study, going through the entire research procedure with a small sample.

Secondary Data and Methods of Data Collection

Methods

1) Internet search, using online resources to gather data for research purposes. This method is not usually very reliable and requires appropriate citation and critical analysis for findings.

2) Library search and indexing, this technique requires to go through written texts that have already done similar work and utilizing their researches for your dissertations.

3) Data collection organizations, for example Gallup and AC Nielsen conduct researches on a recurrent basis ranging in a wide array of topics.

4) News Papers and Magazines, journals and other similar periodicals.

Merits

1. Time saving
2. Low cost to acquire the data
3. Easy to access the data
4. Ensures no duplication
5. Provide bases for comparison

Problems in use of secondary data

1. Incomplete Information
2. Data may be outdated or inaccurate
3. More subjective and bias
4. Not specific to the researcher□s need
5. Lack of Quality

UNIT 4

DATA PROCESSING AND PRESENTATION

Introduction

The plan of data analysis is decided in advance before collecting the data. Important steps of data preparation process are as follows:

1. Questionnaire checking/Content Checking
2. Editing/ Cleaning of Data
3. Classification
4. Coding
5. Tabulation of Data
6. Diagrammatic & Graphical Presentation of Data

After collecting data, the method of converting raw data into meaningful statement; includes data processing, data analysis, and data interpretation and presentation. Data reduction or processing mainly involves various manipulations necessary for preparing the data for analysis. The process (of manipulation) could be manual or electronic. It involves editing, categorizing the open-ended questions, coding, computerization and preparation of tables and diagrams.

Data Processing

The data, after collection, has to be processed and analyzed in accordance with the outline laid down for the purpose at the time of developing the research plan. This is essential for a scientific study and for ensuring that we have all relevant data for making contemplated comparisons and analysis. Technically speaking, processing implies editing, coding, classification and tabulation of collected data so that they are amenable to analysis.

Data Analysis

The term analysis refers to the computation of certain measures along with searching for patterns of relationship that exist among data-groups. Thus, “in the process of analysis, relationships or differences supporting or conflicting with original or new hypotheses should be subjected to statistical tests of significance to determine with what validity data can be said to indicate any conclusions”.

Questionnaire checking/Content Checking

When the data is collected through questionnaires, the first step of data preparation process is to check the questionnaires if they are acceptable or not. This involves the examination of all questionnaires for their completeness and interviewing quality. If sufficient numbers of questionnaires are not accepted, the researcher may like to collect more data.

Editing/Cleaning of Data

Editing of data is a process of examining the collected raw data to detect errors and omissions and to correct these when possible. Editing involves a careful scrutiny of the completed questionnaires and/or schedules. Editing is done to assure that the data are accurate, consistent with other facts gathered, uniformly entered, as completed as possible and have been well arranged to facilitate coding and tabulation.

Data classification/distribution:

Classification according to attributes

As stated above, data are classified on the basis of common characteristics which can either be descriptive (such as literacy, sex, honesty, etc.) or numerical (such as weight, height, income, etc.). Descriptive characteristics refer to qualitative phenomenon which cannot be measured quantitatively; only their presence or absence in an individual item can be noticed. Data obtained this way on the basis of certain attributes are known as statistics of attributes and their classification is said to be classification according to attributes. Such classification can be simple classification or manifold classification. In simple classification we consider only one attribute and divide the universe into two classes—one class consisting of items possessing the given attribute and the other class consisting of items which do not possess the given attribute. But in manifold classification we consider two or more attributes simultaneously

Classification according to class-intervals

Unlike descriptive characteristics, the numerical characteristics refer to quantitative phenomenon which can be measured through some statistical units. Data relating to income, production, age, weight, etc. come under this category. Such data are known as statistics of variables and are classified on the basis of class intervals. For instance, persons whose incomes, say, are within Rs 201 to Rs 400 can form one group; those whose incomes are within Rs 401 to Rs 600 can form another group and so on. In this way the entire data may be divided into a number of groups or classes or what are usually called, 'classintervals. Each group of class-interval, thus, has an upper limit as well as a lower limit which are known as class limits. The difference between the two class limits is known as class magnitude. We may have classes with equal class magnitudes or with unequal class magnitudes. The number of items which fall in a given class is known as the frequency of the given class. All the classes or groups, with their respective frequencies taken together and put in the form of a table, are described as group frequency distribution or simply frequency distribution. Classification according to class intervals usually involves the following three main problems:

Sarantakos(1998) defines distribution of data as a form of classification of scores obtained for the various categories or a particular variable. There are four types of distributions:

1. Frequency distribution
2. Percentage distribution

3. Cumulative distribution
4. Statistical distributions

Frequency distribution

In social science research, frequency distribution is very common. It presents the frequency of occurrences of certain categories. This distribution appears in two forms:

Ungrouped: Here, the scores are not collapsed into categories, e.g., distribution of ages of the students of a BJ (MC) class, each age value (e.g., 18, 19, 20, and so on) will be presented separately in the distribution.

Grouped: Here, the scores are collapsed into categories, so that 2 or 3 scores are presented together as a group. For example, in the above age distribution groups like 18-20, 21-22 etc., can be formed).

Percentage distribution

It is also possible to give frequencies not in absolute numbers but in percentages. For instance instead of saying 200 respondents of total 2000 had a monthly income of less thanRs. 500, we can say 10% of the respondents have a monthly income of less than Rs. 500.

Cumulative distribution

It tells how often the value of the random variable is less than or equal to a particular reference value.

Statistical data distribution

In this type of data distribution, some measure of average is found out of a sample of respondents. Several kind of averages are available (mean, median, mode) and the researcher must decide which is most suitable to his purpose.

Coding

Coding refers to the process of assigning numerals or other symbols to answers so that responses can be put into a limited number of categories or classes. Coding is necessary for efficient analysis and through it the several replies may be reduced to a small number of classes which contain the critical information required for analysis. Coding decisions should usually be taken at the designing stage of the questionnaire. This makes it possible to precode the questionnaire choices and which in turn is helpful for computer tabulation as one can straight forward key punch from the original questionnaires.

Tabulation of Data

Tabulation is the systematic arrangement of the statistical data in columns or rows. It involves the orderly and systematic presentation of numerical data in a form designed to explain the problem under consideration. Tabulation helps in drawing the inference from the statistical figures. Tabulation prepares the ground for analysis and interpretation. Therefore a suitable method must be decided carefully taking into account the scope and objects of the investigation, because it is very important part of the statistical methods.

When a mass of data has been assembled, it becomes necessary for the researcher to arrange the same in some kind of concise and logical order. This procedure is referred to as tabulation. Thus, tabulation is the process of summarizing raw data and displaying the same in compact form (i.e., in the form of statistical tables) for further analysis. In a broader sense, tabulation is an orderly arrangement of data in columns and rows. Tabulation is essential because of the following reasons.

1. It conserves space and reduces explanatory and descriptive statement to a minimum.
2. It facilitates the process of comparison.
3. It facilitates the summation of items and the detection of errors and omissions.
4. It provides a basis for various statistical computations.

Types of Tabulation

In general, the tabulation is classified in two parts, that is a simple tabulation, and a complex tabulation. Simple tabulation, gives information regarding one or more independent questions. Complex tabulation gives information regarding two mutually dependent questions.

This table gives us information regarding one characteristic information about the population in different divisions of Sindh.

All questions that can be answered in ONE WAY TABLE are independent of each other. It is therefore an example of a simple tabulation, since the information obtained in it is regarding one independent question that is the number of persons in various divisions of Sindh in millions.

TWO-WAY TABLE

These types of table give information regarding two mutually dependent questions. For example, question is, how many millions of the persons are in the Divisions; the One-Way Table will give the answer. But if we want to know that in the population number, who are in the majority, male, or female.The Two-Way Tables will answer the question by giving the

column for female and male. Thus the table showing the real picture of division of gender wise is as under:

THREE-WAY TABLE

Three-Way Table gives information regarding three mutually dependent and inter-related questions. For example, from one-way table, we get information about population, and from two-way table, we get information about the number of male and female available in various divisions. Now we can extend the same table to a three way table, by putting a question, "How many male and female are literate?" Thus the collected statistical data will show the following, three mutually dependent and inter-related questions:

1. Population in various divisions.
2. Their sex-wise distribution.
3. Their position of literacy.

This table gives information concerning the literacy of both male and female in various divisions of

Sindh. From the table we can explain the sex which has more education in relation to division, and also, we can say whether literacy is low in rural areas than in urban areas.

Higher Order Tables

Higher order tables are those which provide information about a large number of inter related questions. Higher order tables may be of four-way, five-way, six-way etc. Such kinds of tables are called manifold tables.

Principles of Tabulation

Such principles of tabulation, particularly of constructing statistical tables, can be briefly states as follows:

1. Every table should have a clear, concise and adequate title so as to make the table intelligible without reference to the text and this title should always be placed just above the body of the table.
2. Every table should be given a distinct number to facilitate easy reference.
3. The column headings (captions) and the row headings (stubs) of the table should be clear and brief.
4. The units of measurement under each heading or sub-heading must always be indicated.
5. Explanatory footnotes, if any, concerning the table should be placed directly beneath the table, along with the reference symbols used in the table.
6. Source or sources from where the data in the table have been obtained must be indicated justbelow the table.

7. Usually the columns are separated from one another by lines which make the table more readable and attractive. Lines are always drawn at the top and bottom of the table and below the captions.

8. There should be thick lines to separate the data under one class from the data under another class and the lines separating the sub-divisions of the classes should be comparatively thin lines.

9. The columns may be numbered to facilitate reference.

10. Those columns whose data are to be compared should be kept side by side. Similarly, percentages and/or averages must also be kept close to the data.

11. It is generally considered better to approximate figures before tabulation as the same would reduce unnecessary details in the table itself.

12. In order to emphasize the relative significance of certain categories, different kinds of type, spacing and indentations may be used.

13. It is important that all column figures be properly aligned. Decimal points and (+) or (–) signs should be in perfect alignment.

14. Abbreviations should be avoided to the extent possible and ditto marks should not be used in the table.

15. Miscellaneous and exceptional items, if any, should be usually placed in the last row of the table.

16. Table should be made as logical, clear, accurate and simple as possible. If the data happen to be

very large, they should not be crowded in a single table for that would make the table unwieldy

and inconvenient.

17. Total of rows should normally be placed in the extreme right column and that of columns should be placed at the bottom.

18. The arrangement of the categories in a table may be chronological, geographical, alphabetical or according to magnitude to facilitate comparison. Above all, the table must suit the needs and requirements of an investigation.

Interpretation

Interpretation refers to the task of drawing inferences from the collected facts after an analytical and/or experimental study. Interpretation is concerned within the collected data and the extension of studybeyond the collected data as well. Thus, interpretation is the device through which the factors that seem

to explain what has been observed by researcher and the researcher must give reasonable explanations of the relations of the variables and the findings.

The task of interpretation has two major aspects

(i) The effort to establish continuity in research through linking the results of a given study with those of another and

(ii) The establishment of some explanatory concepts

Diagrammatic & Graphical Presentation of Data

Several types of statistical/data presentation tools exist depending upon the type of data available. Some frequently used graphs, Charts and diagrams are discussed below.

Line Charts

It is the most widely used method of presenting statistical data, especially in business or any other sphere where data are collected over a long period of time. It is very much helpful in explaining the trend present in the series.

The graphical presentation of a time series is called as a ***Historigram*.**

Bar Chart

Bar charts are used to graph the qualitative data. The bars do not touch, indicating that the attributes are qualitative categories, variables are discrete and not continuous. There are different types of bar charts. So, a particular type of bar chart to be used depends upon type of data and comparison needed. Different types of Bar Charts are

I. **Simple bar charts** sort data into simple categories.

II. **Multiple bar charts** divide data into groups within each category and show comparisons between individual groups as well as between categories. (It gives more useful information than a simple total of all the components.).

III. **Stacked bar charts**, which like grouped bar charts, use grouped data within categories. (They make clear both the sum of the parts and each group's contribution to that total.)

Pie-Charts

Pie chart is often used in newspapers and magazines to depict budgets and other economic information. A complete circle (the pie) represents the total number of measurements. The size of a slice is proportional to the relative frequency of a particular category.

Histogram

Histograms are used to graph absolute, relative, and cumulative frequencies. It is graphical representation of frequency distribution in the form of rectangles with class intervals as bases and thecorresponding frequencies as heights, there being no gap between any two successive

rectangles. A histogram is a diagram which represents the class interval and frequency in the form of a rectangle.

Frequency Polygon

In a frequency distribution, the mid-value of each class is obtained. Then on the graph paper, the frequency is plotted against the corresponding mid-value. These points are joined by straight lines. These straight lines may be extended in both directions to meet the X - axis to form a polygon.

Also, we can draw a frequency polygon by joining the mid-points of the tops of the adjoining rectangles of a Histogram. The mid-points of the first and the last classes are joined to the mid-points of the classes preceding and succeeding respectively at zero frequency to complete the polygon.

Frequency Curve

In a frequency curve, we take the values or class-Intervals along the X- axis and the frequencies along the Y – axis. Then we plot the points and by joining these points by a smooth curve, we get a frequency curve.

Ogives or Cumulative Frequency Curves

Ogive is also used to graph cumulative frequency. An ogive is constructed by placing a point corresponding to the upper end of each class at a height equal to the cumulative frequency of the class. These points then are connected. An ogive also shows the relative cumulative frequency distribution on the right side axis. A less-than ogive shows how many items in the distribution have a value less than the upper limit of each class. A more-than ogive shows how many items in the distribution have a value greater than or equal to the lower limit of each class.

Pictogram

Rows of picture symbols of same size representing the comparative magnitudes of the data constitute a Pictogram. Pictograms are used to represent time series data and statistical data classified by attributes.

Content of Research Report

A research report is a written document on a particular topic relating to a particular research problem,

which conveys information and ideas and may also make recommendations. Reports often form the basis of crucial decision making. Inaccurate, incomplete and poorly written reports fail to achieve the objectives and purpose. A good report can be written by keeping the following features in mind:

1. All points in the report should be clear to the intended reader.
2. The report should be concise with information kept to a necessary minimum and arranged logically under various headings and sub-headings.
3. All information should be correct and supported by evidence.
4. All relevant material should be included in a complete report.

Characteristics/ Essentials of a good report

Good research report should satisfy some of the following basic characteristics:

I. **Style** - Reports should be easy to read and understand. The sentences used should be simple, clear and unambiguous.

II. **Layout** - A good layout reduces the communication gap between the reader and researcher.

III. **Accuracy –** A repost should be accurate. Every statement should be based on the facts and figures, otherwise, it may mislead the reader or the management of the concerned organization in the decision making process.

IV. **Clarity –** The technical terms used in the report should be clearly defined and explained.

V. **Readability –** There are several factors helpful to enhance the patience while reading a report. These factors include attractive appearance, clear and direct style, etc.

VI. **Revision** - When first draft of the report is completed, it be checked for spelling and grammatical errors.

VII. Reinforcement - Reinforcement usually gets the message across. This old adage is well known and is used to good effect in all sorts of circumstances e.g., presentations - not just report writing.

Types of Report

Technical Report - A Technical report mainly focuses on methods employed, assumptions made while conducting a study, detailed presentation of findings and drawing inferences and comparisons with earlier findings based on the type of data drawn from the empirical work.

General Reports - General reports often relate popular policy issues mostly related to social issues. These reports are generally simple, less technical, good use of tables and charts. Most often they reflect the journalistic style.

Outline of a Research Report

The findings of research can be presented in three different forms viz.,

Research Paper

This is usually written with the object of being read in a professional gathering or of being published in a journal is the shortest in length

Dissertation

This is usually written to meet the requirement of a semester or term is longer and more detailed

Thesis

This aims at acquiring Ph.D. or M.Phil. is the longest

I. Title Page

II. Table of contents Preliminary pages of the report

III. Abstract

IV. Introduction

V. Research Methodology

VI. Review of Literature

VII. Data Analysis & Interpretation Body of the Report

VIII. Major Findings

IX. Suggestions & Conclusion

X. Appendices

STEPS IN WRITING A REPORT

I. Title Page

II. Certificate of approval

III. Declaration

IV. Acknowledgment

V. Table of contents

VI. List of Tables

VII. List of Figures

VIII. Abstract

IX. Chapter 1: Introduction

(General, Theories, Models, Types, Characteristics)

X. Chapter 2: Research Methodology

- Research Problem:

- Statement of the problem
- Objectives of the study
- General Objective
- Specific Objectives
- Hypothesis
- Field of study
- Need/ Purpose of the study
- Relevance of the study to
- Social Work
- Research Plan:
- Research type: Qualitative/
- Quantitative
- Research design
- Sample Design
- Sampling method
- Sampling procedure
- Population
- Universe
- Unit of analysis
- Sample size
- Analysis design: kind of tables, graphs, statistical tests used Chi square etc
- Tools for data collection
- Pre Test
- Period of study
- Conceptual definitions
- Operational definitions
- Limitations of the study
- Budget

Chapterisation

XI. Chapter 3: Review of Literature

(International, National, Regional)

XII. Chapter 4: Data Analysis & Interpretation

XIII. Chapter 5: Major Findings

XIV. Chapter 6: Suggestions & Conclusion

XV. Appendices

- References
- Bibliography
- Tools
- Letters/ Photos if any.

Reference

References usually come at the end of a text (essay or research report) and should contain only those works cited within the text.

A Reference list should contain only the details of the sources you have cited in the body of your text

Bibliography

A bibliography is a list of the sources you used to get information for the report. It is included at the end of the report, on the last page.

A bibliography may also include details of other sources you consulted when researching a piece of work but may not have cited in your text.

General Guide to Formatting a Bibliography

For a book:

Author (last name first). Title of the book. City: Publisher, Date of publication. Example: Dahl, Roald. The BFG. New York: Farrar, Straus and Giroux, 1982.

For an encyclopedia:

Encyclopedia Title, Edition Date. Volume Number, "Article Title," page numbers.

Example: The EncyclopediaBrittanica, 1997. Volume 7, "Gorillas," pp. 50-51.

For a Magazine:

Author (last name first), "Article Title." Name of magazine. Volume number, (Date):
page numbers.

Example: Jordan, Jennifer, "Filming at the Top of the World." Museum of Science Magazine. Volume 47, No. 1, (Winter 1998): p. 11.

For a newspaper:

Author (last name first), "Article Title." Name of newspaper, city, state of publication. (date):edition if available, section, page number(s).Example: Powers, Ann, "New Tune for

the Material Girl." The New York Times, New York, NY.(3/1/98): Atlantic Region, Section 2, p. 34.

For a person:

Full name (last name first).Occupation. Date of interview. Example: Smeckleburg, Sweets. Bus driver. April 1, 1996.

For a film:

Title, Director, Distributor, Year.Example: Braveheart, Dir. Mel Gibson, Icon Productions, 1995

CD-ROM:

Disc title: Version, Date. "Article title," pages if given.Publisher.

Example: Compton's Multimedia Encyclopedia: Macintosh version, 1995. "Civil rights movement," p.3. Compton's Newsmedia.

Magazine article:

Author (last name first). "Article title."Name of magazine (type of medium). Volume number, (Date): page numbers. If available: publisher of medium, version, date of issue.

Example: Rollins, Fred. "Snowboard Madness." Sports Stuff (CD-ROM). Number 15, (February 1997): pp. 15-19. SIRS, Mac version, Winter 1997.

Newspaper article:

Author (last name first). "Article title."Name of newspaper (Type of medium), city and state of publication. (Date): If available: Edition, section and page number(s). If available: publisher of medium, version, date of issue.

Example: Stevenson, Rhoda. "Nerve Sells."Community News (CD-ROM), Nassau, NY. (Feb 1996): pp. A4-5. SIRS, Mac. version, Spring 1996.

Online Resources

Internet:

Author of message, (Date).Subject of message.Electronic conference or bulletin board (Online).Available e-mail: LISTSERV@ e-mail address

Example: Ellen Block, (September 15, 1995). New Winners.Teen Booklist (Online). Helen Smith@wellington.com

World Wide Web:

URL (Uniform Resource Locator or WWW address).author (or item's name, if mentioned), date. Example: (Boston Globe's www address)

http://www.boston.com. Today's News, August 1, 1996

Writing Research Proposals

A research proposal "*is a document that outlines how you propose to undertake your research studies*" (Mouton, 2001). Essentially, it outlines *what* we will research and *how* we will research it. The "what" part is called the *problem*; the "how" part we call the *plan*. A proposal describes a problem and sets out a logical, systematic plan to solve it. A proposal is an offer to produce or render a service to the potential buyer or sponsor. Thus, the research proposal presents a problem, discusses related research efforts, outlines the data needed and shows the research design. The following are some important usefulness of a research proposal:

- Sponsor Uses Proposal To Evaluate Research Idea,
- Ensures The Sponsor And Investigator Agree To Research Question,
- For Newcomer, Research Proposal Helps Learning From Others, And A
- Completed Proposal Provides A Logical Guidance.

Elements of a Research Proposal

 Research Problem

 Research Plan/Methodology

Research Problem

 Statement of the problem

 Review of Literature (5-10 reviews)

 Title of the study

 Objectives of the study

 General Objective

 Specific Objectives

 Hypothesis

 Field of study

Research Plan/Methodology

 Research type: Qualitative/ Quantitative

 Research design

 Sample Design

 Sampling method

 Sampling procedure

 Population

 Universe

 Unit of analysis

- Sample size
- Analysis design: kind of tables, graphs, statistical tests used Chi square etc
- Tools for data collection
- Period of study
- Conceptual definitions
- Operational definitions
- Budget

Writing Research Abstracts

The scientific abstract is usually divided into five unique sections: Title and Author Information, Objective, Methods, Results, and Conclusions. The following paragraphs summarize what is expected in
each of these sections.

1. *Title and Author Information:*

The title should summarize the abstract and convince the reviewers that the topic is important, relevant, and innovative. Some organizations require a special format for the title, such as all uppercase letters, all bolded, or in italics. Be sure to check the instructions.

Following the title, the names of all authors and their institutional affiliations are listed. It is assumed the first author listed will make the oral presentation. This information is always included with the abstract instructions.

2. *Introduction:*

This usually consists of several sentences outlining the question addressed by the research. Make the first sentence as interesting and dramatic as possible. If space permits, provide a concise review of what is known about the problem addressed by the research, what remains unknown, and how your research project fills the knowledge gaps. The final sentence describes the purpose of the study or the study's a priori hypothesis.

3. *Methods:*

The following areas are specifically mentioned and his must be written in a concise yet detailed manner:

a. Research design

b. Research setting

c. Number of samples enrolled in the study and how they were selected

d. A description of the intervention (if appropriate)

e. A listing of the outcome variables and how they were measured.

f. Finally, the statistical methods used to analyze the data are described.

4. *Results:*

This section begins with a description of the subjects that were included and excluded from the study. For those excluded, provide the reason for their exclusion. Next, list the frequencies of the most important outcome variables. If possible, present comparisons of the outcome variables between various subgroups within the study (treated vs. untreated, young vs. old, male vs. female, and so forth). If table are allowed, this type of data can be efficiently presented in a table. Numerical results should include standard deviations or 95% confidence limits and the level of statistical significance. If the results are not statistically significant, present the power of your study (beta-error rate) to detect a difference.

5. *Conclusion:*

State concisely what can be concluded and its implications. The conclusions must be supported by the data presented in the abstract; never present unsubstantiated personal opinion. If there is room, address the generalizability of the results to populations other than that studied and the weaknesses of the study. Avoid the use of medical jargon and excessive reliance on abbreviations. Limit abbreviations to no morethan three and favor commonly used abbreviations. Always spell out the abbreviations the first time theyare mentioned unless they are commonly recognized.

UNIT 5

STATISTICAL TOOLS & THEIR USE

STATISTICS

MEANING

Statistics is a subject that deals with the collection of data as well as the techniques of analysis and interpretation of data.

CONCEPT

The origin of the word ‘’*STATISTICS*” is indicated by the word itself, which seems to have been derived from the Latin word ‘*STATUS*’ or from Italian word ‘*STATISTA’* or may be from the German word ‘*STATISTIK’*. The meaning of all these words is ‘*Political State*’.

DEFINITION

A. L. Bowley– Statistics are numerical facts in any department of enquiry placed in relation to each other.

Yule and Kendall – By Statistics we mean, quantitative data affected to a marked extent by multiplicity of causes.***H. Secrist***– By Statistics we mean, aggregate of facts affected to a marked extent by a multiplicity of causes, numerically expressed, enumerated or estimated according to a reasonably standard of accuracy, collected in a systematic manner for a predetermined purpose and placed in relation to each other.

IMPORTANCE

Statistics is a mathematical science involving the collection, interpretation, measurement, enumerations or estimation analysis, and presentation of natural or social phenomena, through application of various tools and technique the raw data becomes meaningful and generates the information□s for decision making purpose.)t is the systematic arrangement of data and information exhibits their inner relation between the things. Statistics plays a vital role in every fields of human activity and has important role in determining the existing position of per capita income, unemployment, population growth rate, housing, schooling medical facilities etc. in a country, by which the decision making and development plans of the government becomes concentric.

FUNCTIONS

I. Presents facts in numerical figures.

II. Presents complex facts in a simplified form.

III. Studies relationships between two or more phenomena.

IV. Provides techniques for the comparison of phenomena.

V. Enlarges individual experiences.

VI. Helps in the formulation of policies.

VII. Helps in forecasting.

VIII. Provides techniques for testing of hypotheses.

IX. Provides techniques for taking decisions under uncertainty.

LIMITATIONS

I. Statistics deals with numerical facts only. It is not suited to study of qualitative phenomenon. But, we can apply statistical techniques to these qualitative phenomenons indirectly by first reducing to a suitable precise measurement. For example the intelligence of a group of candidates can be expressed in terms of test scores.

II. Statistics deals only with groups or aggregate of objects and not with individuals. It does not permit any specific recognition for the individual items of a series. Accordingly, statistical analysis is suited to only those problems where group characteristics are to be reviewed.

III. Statistical results are true only on the average. On the basis of statistical analysis, we can talk only in terms of probability or chance ant not in terms of certainty. Statistical laws can never be regarded as universal truths.

IV. Statistical results are only approximately true.

V. Statistics are liable to be misused.

VI. Statistics must be used only by experts.

MEASURES OF CENTRAL TENDENCY

The measures of central tendency give us an idea about the nature of central values of the series or the values those act as the representatives of the whole series.

For example, when we say the average income of the families in a community is Rs 15,000 per month *i.e.,* Rs 15,000 act as a representative of income status of the families living in that community. By seeing only this figure, one can easily guess the economic status of the families of that community; we need not observe the individual family incomes. We can think that the incomes of different families are more or less equal to Rs. 15,000 per month. Thus,the measures of central tendency give the value around which the whole series of data isassumed to be concentrated. Some common measures of central tendency are arithmetic mean, median and mode.

ARITHMETIC MEAN

The arithmetic mean or simply mean of a set of values is defined as the ratio of sum of all the values to the total number of values of the set. It is also called as the average and denoted as (read as x bar). This mean always lies between the maximum and minimum values of the set. For example, the ages of five students of a class are 8, 7.5, 7.2, 8.1, 7.9 years. Here, we can say that the age of the students of the class is around 7.74 years.

Merits

It is simple to calculate and easy to interpret.

Demerits

It's very simple calculation the arithmetic mean cannot be a suitable measure for all purposes. It can only be used in case of a measurable characteristics, but for non-measurable characteristics like honesty,).Q., beauties□, sweetness, etc., we cannot use arithmetic mean. number of children born to couples in a village, it gives fractional values. Suppose there are five randomly selected couples from a village are selected and the number of children born to them is recorded as 3, 2, 0, 2, 1. So, the average number of children per couple is x bar = (3+2+0+2+1)/5 = 1.6 which is quite absurd.

.

MEDIAN

So, in order to avoid the drawbacks of arithmetic mean, we define another measure of central tendency, called as median. The median of a series is defined as the value, which divides the series into two equal parts after arranging the values either in ascending or descending order. In the above example, the median number of children born to the couple is calculated as follows. Arranging the number of children in ascending order, we get: 0, 1, 2, 2, 3. Median = The value present in the middle = 2 (third value) So, the median number of children born to the couple is 2.

The value of the median depends upon the number of observations in the series, i.e., the numberof observations is even or odd. Suppose the age of 10 students of a school is 12, 11, 13, 14, 18, 16, 11, 15, 19 and 8 years. Here, the number of values n= 10 (even). So, arranging in ascending order, we get 8, 11, 11, 12, 13, 14, 15, 16, 18, 19.

The mean of 5th and 6th value = (13+14)/2=13.5 years

Merits

- To interpret.
- It is rigidly defined.

Demerits

- It can be calculated by arranging the values either in ascending or descending order,which is very difficult for large number of values.

MODE

Again, we sometime give emphasis on the most frequent value in the series. For example, in an election there are several contesting candidates and the candidate getting maximum votes wins the election. In previous example, the maximum couples have two children (two couples). In a shoe shop, there are shoes of different sizes available, but the shopkeeper stocks a shoe whose number has maximum demand. Therefore, we define another measure of central tendency, which is called as mode. The modeof a series is defined as the most frequent value in the series, i.e., the value which has maximumfrequency in the series.

For example the following data gives the number of children born to 10 different couples.

Number of Children: 0 1 2 3

Number of Couples (Frequency): 2 4 3 1

Maximum frequency is 4, which occurs for 1, so mode is 1 child.

Merits

- Is easily understood by the common man.
- Frequency distribution.
- Open-end classes.

Demerits

- It is not suitable for algebraic treatment.

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MEASURES OF DISPERSION

Consider the mark sheet of three students in eight tests in Statistics in a month as given below:

The measures of dispersion are the measures which give us an idea about the variability or scattering of values of a variable. Some common measures of dispersion are

I. Range,

II. Quartile Deviation,

III. Standard Deviation and

IV. Coefficient of Variation.

RANGE

Range is the simplest measure of dispersion, which is defined as the difference between the maximum and the minimum value of a series. So, for the Student A,

Range = Maximum Value – Minimum value = 70 – 50 = 20.

For the Student B, Range = Maximum Value – Minimum value = 87 – 33 = 54.

For the Student C, Range = Maximum Value – Minimum value = 97 – 12 = 85.

So, the heterogeneity of marks is more for Student C than Student A and B.

Merits and Demerits

Range is simple to understand and easy to calculate. But, it has many disadvantages. It is very much affected by the presence of an extremely high or low value. It is not based on all the values of the series. It cannot be calculated for the grouped frequency distributions with open – end classes.

QUARTILE

The range gives a rough idea about the scattering of data as it depends only upon the maximum and minimum value and not depends upon the intermediate values. So, its value may be same for two different series and it does not take into account the magnitude of the values. Therefore, we need another measure, which should depend upon intermediate values also. One such measure is the *quartile deviation*. So, the quartile deviation is a measure that depends upon the *quartiles* of a series. For the marks of Student A, it can be calculated that the first and third quartiles are 55.25 and 66.5 respectively

Quartile Deviation = (Q3-Q1)/2= (66.5 – 55.25)/2=5.625

Merits and Demerits

Quartile deviation is easy to calculate and its calculation depends on the first and third quartiles only. It is not based on all the values of the series. It can be calculated for a grouped frequency distribution with open-end classes.

STANDARD DEVIATIONS

Now, the quartile deviation does not depend upon all the values of the series, so we define another measure known as *standard deviation* that depends upon all the values of the series. Standard deviation□σ□□pronounced as sigma□ is defined as the square root of the average of the squares of deviations, when such deviations for the values of individual items in a series are obtained from the arithmetic average.

Merits and Demerits

Standard deviation is the most important and widely used among the measures of dispersion. It is rigidly defined and based on all the values of the series. It is suitable for further algebraic treatment. It is less affected by sampling fluctuations than any other absolute measures of dispersion. On the other hand, standard deviation is difficult to calculate and also difficult to understand. Its calculation is also very much complicated.

CHI SQUARE – USES & APPLICATIONS

As suggested by *S.P. Gupta,* 1997, two or more classes or categories in a table were grouped together for greater precision. For example, various categories of respondents indicating agreement with a given statement were joined together and read as a single category. Similarly, various shades of disagreement were combined together and made into a single category. The chi-square test is based on a test statistic that measures the divergence of the observed data from the values that would be expected under the null hypothesis of no association. This requires calculation of the expected values based on the data. The expected value for each cell in a two-way table is equal to (row total*column total)/n, where n is the total number of observations included in the table. The chi-square test statistic is computed as: where the square of the differences between the observed and expected values in each cell, divided by the expected value, are added across all of the cells in the table. The test of chi-square is a widely used nonparametric test in social work researches. We pronounce $\chi 2$ test as □*Kai square test'*. The chi-square test was developed by *Karl Pearson* in 1900. This test is used to test whether the set of observed values as the outcome of our experiment support the expected values, which based on any hypothesis or theory. By using chi-square test of goodness of fit we can know if the deviation between observed (experimental) value and expected (theoretical) values significantly different from each other or not. That is to say if the observed value do not differ significantly from the expected (Theoretical) values then we say the data to be good fit to the theory or hypothesis. For example, whether the chewing of tobacco is equally prevailing among males and femalesin a tribal community or not. To

verify this belief, we can use a chi-square test for goodness of fit. Another example, suppose we want to verify that, male and females are equally represented in different societies of an area or not. To verify whether all classes of people are equally represented in different village committees of a block or not. So, this chi-square test has a wide range of applications in social work research.

Conditions for the Validity of Chi-Square Test

i. The frequencies used in chi-square test must be absolute, not relative in terms.

ii. Each of the observations making up the sample for this test must be independent of each other.

iii. Total number of observations used in chi-square test must be large. It should be at least 50.

iv. The observation collected for this test must be on basis of random sampling.

v. No assumption is made regarding population distribution and no parameter of population distribution is required for this test. This test is solely based on sample data.

vi. The expected frequency of any item or cell must not be less than 5. If it is less than 5, the frequencies taking from adjacent items or cells should be pooled together in order to make it 5 or more than 5.

APPLICATIONS OF KARL PEARSON'S CORELATION TEST IN SOCIAL WORK

Karl Pearson's coefficient of correlation (or simple correlation) is the most widely used method of measuring the degree of relationship between two variables. This coefficient assumes the following:

- That there is linear relationship between the two variables
- That the two variables are casually related which means that one of the variables is
- independent and the other one is dependent
- A large number of independent causes are operating in both the variables so as to produce a normal distribution

Karl Pearson□s coefficient of correlation □r□ = Σ □Xi-X) (Yi-Y□ / n. σX. σY

STANDARD ERROR

For a sample of size n and a population with mean μ □miu□ and standard deviation σ □sigma□,

the standard error of the sample mean E is given by the formula:

$E=\sigma/\sqrt{n}$

APPLICATION OF STATISTICS IN SOCIAL WORK PRACTICE

Statistics is a science of facts and figures and nothing beyond that. It's a measurement of data and expression of the same in the numerical manner. It includes frequency distribution, measurement of central value or tendency, deviations, regressions, co-relations, t-test and goodness of fit.

Uses of social statistics:

1. It is highly quantitative than qualitative
2. Statistical method deals with two fundamental principles
3. Statistical unit
4. Statistical data must be manipulated
5. Presentation of statistical data with the help of line-diagram

- It is highly quantitative than qualitative:
- Social statistics which present the data of an area must be numerous in nature. By which wecan measure the tendency of a project.In a little period, it also understand by everyone, when listen the percentage. So it is easy torecord and easy to understand.Statistical method deals with two fundamental principles:

 Fundamental regularity based on mathematical probability

 It says about capacity of the researcher

Fundamental regularity based on mathematical probability:

It states that every social phenomena is influenced by large number by variables, which are co-related and inter related and statistics ls to study this co-relation. Therefore the theory of probability, leniour programmes and shadow prices are used to find-out the reality.

It says about capacity of the researcher: For substantiation of findings and conclusions, statistical jargon are necessary and it save the researcher/scholar from danger and challenges. It is the data, facts and figures which say the capacity of the researcher. The skills and the resources whichis used by the researcher must be applied in its research finding.

3. Statistical Units:

- Appropriateness
- Clarity

- Measurability
- Comparability

4. Statistical data must be manipulated:

The statistical data must be manipulated, divided and totaled to formulate some conclusions.

5. Presentation of statistical data with the help of line-diagram: Presentation of statistical data with the help of line-diagram, graphs, charts, histogram, frequency, distribution, pie-diagrams etc.

Limitations of social statistics:

1. Statistics is highly quantitative
2. It's not provide adequate data
3. It can present time to time presentation of data

- Statistics is highly quantitative:

  Social statistics is totally based on number which never present a correct data, accurate information of an area which can be qualitative in nature. Only from the number and percentage, we can't identify the accurate jargon.

- It's not provide adequate data:

  The social statistics can□t provide adequate knowledge about a particular field as the dataabout population, age group, types of problem, causes of problem and the internal resources to solve that problem. It is only provide a figure as percentage.

- It can present a data within a time limit:

  The sensex data, annual budgeting, 5 year plans, these are the sources to get information of afield, which is officially correct but non-officially it's not find as accurate. It's only theoretically correct.