

7. Methods of Data Collection

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7.1 Introduction:

The process of data collection is pivotal in research, commencing after defining the research problem and outlining the research design. Data collection is a fundamental aspect of research, providing the foundation upon which insights and conclusions are built.

The methods used to collect data play a crucial role in the reliability and validity of the findings. This chapter explores various methods of data collection, ranging from traditional approaches to modern techniques, highlighting their strengths, limitations, and do's and don'ts.

By understanding these methods, researchers can make informed decisions about the most suitable approach for their study, ensuring that the data collected is robust and relevant.

What is Data?

Information can take on diverse forms, such as numerical or textual content on physical documents, binary data stored in electronic memory, or knowledge retained in human memory.

While "datum" technically refers to a single piece of information, "data" is commonly used both in singular and plural contexts.

High-quality data is accurate, timely, well-organized for its intended purpose, and presented in a meaningful context. It contributes to enhanced understanding and reduced uncertainty.

What is Information?

Data refers to unprocessed or unstructured content, including letters, numbers, or symbols, that signifies or represents conditions, concepts, or entities. Information is significant as it can influence actions, decisions, or results.

For instance, when informed that their company's net profit declined in the previous month, a manager might use this information to justify reducing financial expenditures. Information is deemed worthless if, after receiving it, there is no change in circumstances.

7.2 Need for Data Collection:

The copy warned the Little Blind Text, that where it came from it would have been rewritten a thousand times and everything that was left from its origin would be the word "and" and the Little Blind Text should turn around and return to its own, safe country. But nothing the copy said could convince her and so it didn't take long until a few insidious Copy Writers ambushed her, made her drunk with Longe and Parole and dragged her into their agency, where they abused her for their projects again and again. And if she hasn't been rewritten, then they are still using her.

Data play a crucial role in research, serving several key purposes:

- Data collection forms the foundational basis of any educational research, providing essential support for the study.
- Data can be likened to raw material in the production of research, with its quality directly impacting the research's quality.
- It offers a clear direction and definitive answers to research inquiries, ensuring investigations lead to conclusive outcomes, making it vital for scientific research.
- Data substantiate various arguments within research findings, adding credibility to the study.
- The primary aim of data collection is to validate hypotheses.
- Statistical data serve two fundamental functions in investigations: (a) Estimating population parameters, aiding in drawing generalizations. (b) Testing hypotheses through the data collection process.
- Qualitative data help uncover facts, while quantitative data aid in developing new theories or principles.
- Data are also crucial in determining the practical utility and effectiveness of new devices.
- Data are necessary for providing solutions to problems encountered in research.

7.2.1 Precautions in Data Collection:

When collecting data, it is crucial to observe the following precautions:

- Ensure that the data is relevant to the research problem at hand.
- Use formal or standardized research tools for data collection.
- Collect data in a way that allows for easy statistical treatment.
- Minimize measurement errors in the data.
- Collect data that can be used to verify hypotheses.
- Ensure that the data allows for the estimation of population parameters for inferential purposes.
- Ensure that the data is comprehensive and complete.
- Collect data using objective procedures.
- Ensure that the data is accurate and precise.
- Ensure that the data is reliable and valid.
- Collect data that can be easily presented and interpreted.

- Use a scoring procedure for the research tool that is easy and objective.

7.2 Types of Data:

7.2.1 Primary Data:

Primary data refers to original information collected specifically for a particular purpose. It involves gathering data directly from the source firsthand. This type of data is known as primary data. It is the raw form of research data, collected directly from firsthand experience, without any analysis or processing. Primary data offers a wealth of information for researchers and can include empirical test results, interview and survey transcripts, and recorded observations.

7.2.2 Secondary Data:

Secondary data refers to information sourced from prior research efforts, which is then utilized for new data collection purposes. The rising popularity of secondary data in research is attributed to the wide availability of published statistics across diverse fields, making required data readily accessible to investigators in many cases. Certain studies, such as those examining stock price behavior, interest rates, and exchange rate scenarios, rely solely on secondary data.

Primary Data:

Definition of Primary Data:

It mainly refers to the one which is original and is originated for the **first time by the one conducting research** through his large efforts, mainly for finding out the solution to the research problem. The researcher gets firsthand information from the respondents.

Primary data is the kind of data that is collected directly from the data source without going through any existing sources. It is mostly collected specially for a research project and may be shared publicly to be used for another research.

Primary data is often reliable, authentic, and objective in as much as it was collected with the purpose of addressing a particular research problem.

The collection of primary data seems to be quite expensive as the responsibility of collection and research of primary data is on the concerned organization itself. This data only become the source of secondary data which is obtained by conducting several statistical operations on this data.

Advantages of Primary Data:

- Data collected is very specific to the problem and is useful.
- Quality of the data collected is meaningful.

- It may lead to the discovery of additional data and information during its collection.
- Original and independent collection increased the authenticity of data.
- Direct collection enhances the reliability of data.
- Used in both quantitative and qualitative research methods.
- Hidden information can be collected through primary data.

Disadvantages of Primary Data:

- The cost involved in the collection of primary data is very high.
- Reliability depends on respondents' information accuracy.
- Information can be biased.
- Time consuming in nature.
- Lack of experience by researcher.

Sources of Primary Data

People can distinguish primary data from other kinds of data by the fact that it is directly collected and presented without commentary. Secondary data consists of things like research papers based on the data.

The major disadvantage of primary data is the sheer volume of information. People would need to read through pages and pages of information to extract usable data. In data processing, researchers use statistics and other tools to present the data in a more accessible format, turning raw results into meaningful statements like "20% of study participants reported feeling nauseous."

7.3 Questionnaire Method:

The questionnaire method of data collection is widely used, especially in large-scale inquiries, and is embraced by private individuals, researchers, organizations, and governments alike. This method involves sending a questionnaire, typically by post, to individuals soliciting their responses to a series of questions. The questionnaire comprises questions printed or typed in a specific order on a form or set of forms. Respondents are expected to read and comprehend the questions, then write their responses in the designated spaces on the questionnaire itself. This survey method is versatile and can be conducted via various means such as telephone, mail, face-to-face interviews, or other methods. Questionnaires serve as a systematic means to gather responses from a sample drawn from the population of interest, making them a valuable tool in normative survey research, particularly when direct interaction with respondents is not feasible.

It is list of questions related to one topic.

It may be defined as; "A questionnaire is a systematic compilation of questions that are submitted to a sampling of population from which information is desired."

-Barr, Davis & Johnson

“In general, the word questionnaire refers to a device for securing answers to questions by using a form which the respondent fills in himself.”

-W. J. Goode & K. Hal

Purposes of questionnaire in research are twofold:

- To collect information from the respondents who are scattered in a vast area and
 - achieve success in collecting reliable and dependable data.

7.3.1 Types of Questionnaires:

There are diverse forms of questionnaire used in research. These are discussed briefly here.

A. Structured and Non-structured Questionnaires: Structured questionnaires contain specific, clear, and straightforward questions, while non-structured questionnaires may include partially completed questions or statements. Non-structured questionnaires are commonly used as interview guides, which are non-directive in nature. Interviewers only have a rough outline of the inquiries and are largely free to organize the format or statements of the questions. Questions initially framed in a general manner are tailored to specific situations during the actual interview process.

B. Closed Form and Open Form: Questions that require short or check responses are classified as restricted or closed form type. This format allows for responses such as yes or no, short answers, or checking an item from a provided list of responses. It limits the respondent's choice to select from the provided responses, rather than formulating their own. Restricted form questionnaires are easy to complete, consume less time, keep the respondent focused, are relatively more objective, and are generally more acceptable and convenient for respondents. They are also relatively easy to tabulate and analyze. In contrast, open form, open-end, or unrestricted type questionnaires call for free responses in the respondent's own words. Here, the respondent frames and provides their own response without any prompts. This format potentially elicits deeper responses, as the respondent reveals their thoughts, provides their frame of reference, and possibly explains their reasons for their responses. However, interpreting, tabulating, and summarizing such responses in the research report can be challenging, as the respondent's expressions may take unique directions that do not align with earlier responses.

C. The Mixed Questionnaire: The mixed questionnaire combines closed-end and open-end questions, offering a versatile approach in social research. Such questionnaires often feature a mix of both types of questions. Each question type has its own advantages and drawbacks, requiring the research to carefully consider which type is best suited to obtain the desired information.

D. Fact and Opinion Questionnaires: Questionnaire are also classified as: (1) Questionnaire of fact, which requires certain information of facts from the respondent without any reference to his opinion or attitude about them, and (2) Questionnaire of opinion and attitude in which the informant's opinion, attitude or preference regarding some phenomena is sought.

E. Pictorial and Verbal Questionnaires: In the pictorial questionnaire, pictures are used to promote interest in answering questions. It is used extensively in studies of social attitudes and prejudices in children or illiterate persons. In a pictorial questionnaire, the selected alternative answers in the form of pictures are given and the respondent is required to tick the concerned picture. This questionnaire may be very useful for collecting data in a developing country like India, specially from the rural masses who are mostly illiterate and less knowledgeable. The serious limitation of this questionnaire is that it is lengthy in form. Also, it is highly expensive. Verbal questionnaire uses words and numbers only. It is the usual form meant for literate respondents.

Merits of Questionnaire Method:

The merits of this method are as follows:

- There is low cost even when the universe is large and is widely spread geographically.
- It is free from the bias of the interviewer; answers are in respondents' own words.
- Respondents have adequate time to give well thought out answers.
- Respondents, who are not easily approachable, can also be reached conveniently.
- Large samples can be made use of and thus the results can be made more dependable and reliable.

Demerits of Questionnaire Method:

The main demerits of this method are listed as under:

- Low rate of return of the duly filled in questionnaires; bias due to no-response is often indeterminate.
- It can be used only when respondents are educated and cooperating.
- The control over questionnaire may be lost once it is sent.
- There is inbuilt inflexibility because of the difficulty of amending the approach once questionnaires have been dispatched.
- There is also the possibility of ambiguous replies or omission of replies altogether to certain questions; interpretation of omissions is difficult.
- It is difficult to know whether willing respondents are truly representative.
- This method is likely to be the slowest of all.

Dos and Don'ts of Questionnaire:

- a. Purpose of questions:** in the questionnaire every question should have purpose. While preparing the questionnaire the researcher has to ask himself that is this question necessary? Can the respondent answer the question? Will respondent willingly answer the question?
- b. Separate questionnaire:** If the respondents are different, the researcher should prepare separate questionnaire.
- c.** E.g. if the researcher is studying Stress Management of employees, then the researcher should prepare two separate questionnaires for employees and management.

- d. **Qualities:** The layout of the questionnaire should be catchy; the paper used for the questionnaire should be of good quality and the questions should be typed.
- e. **Length of the questionnaire:** The length of the questionnaire should be such that it should give all the necessary information required for the study but it should not be too long. The questionnaire should be as brief as possible.
- f. **Instructions:** The instructions to be given to the respondents should be very clear so that there should not be any confusion in the mind of the respondents.
- g. **Language:** The language used in the questionnaire should be simple, easy and familiar to the respondents. Abbreviations, terminologies should not be used in the questionnaire. The respondent should be kept in the mind while framing the questionnaire.
- h. **Adequate Space:** In case of open-ended questions adequate space should be provided below each question so that the respondent will be able to write sufficient answer of the question.
- i. **Clear and unambiguous questions:** The question in the questionnaire should be clear and unambiguous. Question should be very specific. No vague question should be asked.
- j. **Separate questions:** While preparing questionnaire a researcher should not mix two points in one question. Separate question should be asked for different points.
- k. **Confidential and embarrassing questions should not be asked.**
- l. **Logical arrangement:** The arrangement of question should be from simple to complex. The question should be arranged in a logical manner.
- m. A researcher should counter check the answers.
- n. **Covering letter:** A covering letter should be given at the beginning of the questionnaire. In this covering letter a researcher should give his full information and the instructions regarding filling up of questionnaire.

7.4 Interview Method:

Interview is face to face conversation with respondents. It is slow, expensive and takes people away from regular work. Interviewer can not only record the statements the interviewee speaks but also can observe the body language or non verbal communication such as face-pulling, shrugging, hand gestures that add further meaning to spoken words. **Interview** is one of the popular **methods of research data collection**. The term interview can be dissected into two terms as, 'inter' and 'view'. The essence of interview is that one mind tries to read the other. The interviewer tries to assess the interviewed in terms of the aspects studied or issues analysed.

7.4.1 Types of Interviews Used in Research:

There are different types of interviews used in the research data collection. An interview is either structured or unstructured, depending upon whether a formal questionnaire has been formulated and the questions asked in a prearranged order or not. An interview is also either direct or indirect as a result of whether the purposes of the questions asked are plainly stated or intentionally disguised. Cross-classifying these two characteristics provides four different types of interviews. That is, an interview may be

A. structured and direct,

- B. unstructured and direct,
- C. structured and indirect, or
- D. unstructured and indirect.

Types (1) and (2) are basically objective types; (3) and (4) are subjective types.

- A. Structured-Direct Interview:** The usual type of interview conducted during a consumer survey to obtain descriptive information is one using a formal questionnaire consisting of non-disguised questions, a questionnaire designed to “get the facts”. If the marketing search manager of a television set manufacturer wants to find out how many and what kinds of people prefer various styles of television cabinets, for example, he may have a set of questions drawn up that asks for these facts directly. Assuming that personal interviewing is being used, each interviewer will be instructed to ask the questions in the order given on the questionnaire and to ask only those questions. The resulting interviews will be structured- direct in nature.
- B. Unstructured-Direct Interview:** In the unstructured-direct method of interviewing, the interviewer is given only general instructions on the type of information desired. He is left to ask the necessary direct questions to obtain this information, using the wording and the order that seems most appropriate in the context of each interview. Unstructured-direct interviews are often used in exploratory studies. Many research projects that use a formal questionnaire for the final interviews go through an exploratory phase in which respondents are contacted and unstructured interviews are held. These interviews are useful in obtaining a clearer understanding of the problem and determining what areas should be investigated.
- C. Structured-indirect interview:** In the case of structured indirect interview the questions are pre-decided and arranged in a structured way. However the purpose of the study is not revealed.
- D. Unstructured-indirect interview:** In the case of unstructured indirect interview the questions aren't pre-decided and neither the purpose of the study made known explicitly.

There are **other types of interviews**, like focus-group interview, depth interview, etc. All these are dealt here.

- a. Focus-Group Interviews:** Perhaps the best-known and most widely used type of indirect interview is the one conducted with a focus group. A focus-group interview is one in which a group of people jointly participate in an unstructured-indirect interview. The group, usually consisting of 8 to 12 people, is generally selected purposively to include persons who have a common background or similar buying or use experience that relates to the problem to be researched. The interviewer, moderator, as he or she is more often called, attempts to focus the discussion on the problem areas in a relaxed, nondirected manner. The objective is to foster involvement and interaction among the group members during the interview will lead to spontaneous discussion and the disclosure of attitudes, opinions, information on present or prospective buying and use behavior.
- b. Focused Interviews:** This is a semi-structured interview where the investigator attempts to focus the discussion on the actual effects of a given experience to which the respondents have been exposed. It takes place with the respondents known to have

involved in a particular experience, e.g., seeing a particular film, viewing a particular program on TV., involved in a train/bus accident, etc. The situation is analyzed prior to the interview. An interview guide specifying topics relating to the research hypothesis is used. The interview is focused on the subjective experiences of the respondent, i.e., his attitudes and emotional responses regarding the situation under study. The focused interview permits the interviewer to obtain details of personal reactions, specific emotions and the like. The merits of using this type of interview is that, it's free from the inflexibility of formal methods, yet gives the interview a set form and insures adequate coverage of all the relevant topics. The respondent is asked for certain information, yet he has plenty of opportunity to present his views. The interviewer is also free to choose the sequence of questions and determine the extent of probing.

- c. **The Depth Interview:** In marketing research, unstructured and informal interviews are commonly used to delve into the consumer's underlying predispositions, needs, desires, feelings, and emotions regarding products and services. This type of interviewing, known as a "depth interview," can include both direct and indirect questions, or a combination of both. A skilled interviewer will typically use both question types. For example, they might ask a direct, open-ended question like "What are the main reasons you chose to purchase your iPhone?" followed by an indirect question such as "Why do you think individuals who own smartphones decided to buy them?" By following the leads and cues provided by respondents, framing questions to maintain the conversational flow and rapport, the interviewer can effectively explore and probe the respondent's underlying motivations.
- d. **The Personal Interview:** The personal interview involves an interviewer posing questions to one or more respondents in a face-to-face setting. The interviewer's primary role is to engage with the respondent(s), ask the relevant questions, and accurately record the answers. The recording of information can occur either during or after the interview, but it is essential for the interviewer to ensure that the answers are clear, unambiguous, and recorded accurately.
- e. **The Telephone Interview:** Telephone interviews are sometimes utilized instead of in-person interviews, particularly when there is a need for quick and cost-effective data collection and the required information is limited. They are particularly suitable for research scenarios such as determining incidental television or radio program viewing. In such studies, calls are made to a sample of telephone subscribers during the program's broadcast. Respondents are simply asked if they are currently watching television and, if so, which program. Additional questions may include the frequency of watching the program and its sponsors. This method provides a rapid and cost-effective way to measure audience levels. Telephone interviews can be either structured or unstructured, but due to the typically well-defined, non-confidential, and limited nature of the information sought, most are structured.

Advantages:

Following are the main advantages of Interview Method:

- **Personal touch:** In this method there is a personal touch of researcher with the respondent, hence, he/she can get necessary information.
- It is applicable at any time.

- Through this method qualitative information can be obtained and therefore the respondent can create the insight in the problem.
- Through this method the non-verbal conversation can be observed. The researcher can observe the body language of the respondent.
- This is more flexible method of primary data collection.
- The researcher can get information of all questions.
- Cross checking of answers is possible in this method.

Limitations:

- a. It is time consuming and costly method, especially when the sample is large.
- b. In this type of method, there is a possibility that the respondent may hesitate to answer the questions.
- c. This is too flexible method hence sometimes the analysis of the information may become difficult.
- d. In this method there are communication barriers.
- e. It is difficult to get the appointments of the respondents.

DO'S and DON'TS of Interview Method:

Interviewing is an art and one learns it by experience. However, the following points may be kept in view by an interviewer for eliciting the desired information:

- a. Interviewer must plan in advance and should fully know the problem under consideration. He must choose a suitable time and place so that the interviewee may be at ease during the interview period. For this purpose, some knowledge of the daily routine of the interviewee is essential.
- b. Interviewer's approach must be friendly and informal. Initially friendly greetings in accordance with the cultural pattern of the interviewee should be exchanged and then the purpose of the interview should be explained.
- c. All possible effort should be made to establish proper rapport with the interviewee; people are motivated to communicate when the atmosphere is favourable.
- d. Interviewer must know that ability to listen with understanding, respect and curiosity is the gateway to communication, and hence must act accordingly during the interview. For all this, the interviewer must be intelligent and must be a man with self-restraint and self-discipline.
- e. To the extent possible there should be a free-flowing interview and the questions must be well phrased in order to have full cooperation of the interviewee. But the interviewer must control the course of the interview in accordance with the objective of the study.
- f. In case of big enquiries, where the task of collecting information is to be accomplished by several interviewers, there should be an interview guide to be observed by all so as to ensure reasonable uniformity in respect of all salient points in the study.

7.5 Observation Method:

"It is thorough study based on visual observation.

Under this technique group behaviours and social institutions problems are evaluated.”

- C.Y. Younge

“Observation employs relatively more visual and senses than audio and vocal organs.”

- C.A. Mourse

The observation method is widely used, particularly in studies of behavioral sciences. For example, Newton discovered the laws of motion and gravity through observation. This method relies more on visual observation than on listening or speaking. Researchers using this method collect information through their own direct observations, without asking the respondent. For instance, in a study of consumer behavior, rather than asking the respondent about the brand of motorcycle they use, the researcher may observe the motorcycle directly.

It is sometimes useful to use this method along with questionnaire and interview method. There is a difference between *seeing and observation*. Observation is planned methodological watching. Seeing is passive process but the observation is always active process. We observe different thing e.g.

- Physical action and situation: In case of Time Study, Motions Study and Fatigue Study we observe physical actions and situations.
- Verbal Behaviour: i.e. conversation. The discussion between manager and worker, worker and worker, conversation between salesman and customer.
- Expressive Behaviour: Facial expression, body language, tone, speech etc.
- Verbal Behaviour: Words, Statements, phrases used by the person in his conversation.

Characteristics of Observation Method:

- It is always very direct method.
- The field observation takes place in the natural environment. Here the researcher has to visit that place and observe the situation.
- Observation method is less structured.
- Observation method followed in qualitative research.
- This method exposes the researcher to the reality. Sometimes the reality may be strange than fiction.

Advantages of Observation Method:

Following are the main advantages of observation method:

- The information obtained under this method relates to what is currently happening; it is not related to past behaviour or future intentions.
- This method is not dependent on the respondents' willingness to respond.
- When the respondents are illiterate or children then this method is useful.

- The conclusions are more reliable as the study is based on the observation of the researcher.
- It is less expensive method.
- Real time data is available

Limitations of Observation Method:

- The information provided by this method is very limited.
- Everything is not observable. Some events can not be observed. For example: emotional feelings are absolutely unobservable.
- The interpretation of the observation depends upon researcher's perceptions. Hence the conclusions become subjective.
- It is time consuming method. If the sample is large this method is not useful.
- An entry barrier is most important problem. Many companies don't allow the researcher to enter into the company for the observation purpose.
- Quantification of the observation is not possible. Human feelings are most difficult to quantify.
- **Interpretation challenges:** Interpreting observational data can be complex, as researchers must infer meaning from observed behaviors, which can be subjective.

Observation Methodology:

Observation method answers the following questions:

- a. Who are to be observed?
- b. What is to be observed?
- c. Why it is to be observed?
- d. When it is to be observed?
- e. Where is to be observed?

7.5.1 Types of Observation:

There are different types of observation. The important ones are listed below:

- A. Casual and Scientific Observation:** Observations can be either casual or scientific in nature. Casual observations happen spontaneously, without prior planning. It relies on chance for the right thing to be observed at the right time and place. In contrast, scientific observations are conducted with careful preparation, using appropriate measurement tools, experienced enumerators, and under expert guidance. Scientific observations aim to produce comprehensive and precise data.
- B. Simple and Systematic Observation:** Observations can be categorized as either Simple or Systematic. Simple Observation is prevalent in most research studies, particularly during the initial exploration stages. It is characterized by its lack of standardization, aligning with the exploratory nature of research. Participant studies are

often considered simple observation because the roles of participants do not allow for systematic observation. In contrast, systematic observation follows standardized procedures, involves observer training, recording schedules, and sometimes even controls over the observer or subject. While some level of systematization is beneficial in research observation, practical constraints often limit the extent to which this can be achieved. Systematic observation is considered a scientific approach to observation.

- C. Subjective and Objective Observation:** Observation can be categorized as either Subjective or Objective. In every act of observation, there are two components: the object (what is being observed) and the subject (the observer). Sometimes, one may need to observe their own immediate experience, known as Subjective Observation, Self-observation, or introspection. Subjective observation often includes prejudices and biases. Many data of psychological interest are collected through subjective observation. To mitigate these biases, the observer must reflect on themselves to identify and overcome any prejudices or biases that might hinder impartial and disinterested observation. Continuous self-observation and feedback from others can help overcome these biases. This introspection also has social value, as it sensitizes the observer to others' problems and fosters sympathetic insight, aiding in understanding people's behavior in similar circumstances and cultural contexts. The result is impartial subjective observation. Objective observation occurs when the observer is distinct from the thing being observed.
- D. Factual and Inferential Observation** Observation may be either factual or inferential. In factual observation things or phenomena observed with naked eyes are reported. In inferential observation behavior or psychological aspects are observed.
- E. Direct and Indirect Observation:** Observation can be classified as either Direct or Indirect. In direct observation, the observer is physically present and personally monitors the events and behaviors as they unfold. This method allows for flexibility in shifting positions, changing the focus of observation, and capturing unexpected events. In contrast, indirect observation involves recording through mechanical, photographic, or electronic means. For instance, a special motion picture camera mounted in a department of a large store captures customer and employee movement by taking one frame every second.
- F. Behavioral and Non-behavioral Observations:** Observation can be classified as either behavioral or non-behavioral. The concept of observation encompasses not only watching but also listening and reading. Thus, observation involves monitoring both behavioral and non-behavioral activities and conditions. Behavioral observational studies of persons can be categorized into four major groups: non-verbal analysis, linguistic analysis, extra-linguistic analysis, and spatial analysis. Non-behavioral studies of persons can be categorized into three major groups: record analysis, physical condition analysis, and physical process analysis. Non-verbal behavioral observation includes monitoring body movements, motor expressions, and exchanged glances. Body movement can indicate interest, boredom, anger, or pleasure in a particular environment. Motor expressions, such as facial movements, can indicate emotional states. For example, eye-blink rates are studied as indicators of interest in advertising messages. Exchanged glances are also of interest in studies of interpersonal behavior. Linguistic behavior is another commonly used form of behavioral observation.

Schedules:

This method resembles the questionnaire approach. Enumerators, specially appointed for the task, fill out schedules (a set of questions) in this method. They visit respondents with these schedules, ask questions in the order listed, and record the responses in the provided spaces. In certain cases, respondents may be given the schedules to fill out themselves, with enumerators assisting them in recording their answers. The success of this method relies on the careful selection and training of enumerators. Enumerators should possess qualities such as honesty, sincerity, hard work, patience, and perseverance. While effective, this method is costly and is typically employed in investigations conducted by governmental agencies or large organizations. Population censuses worldwide are conducted using this method.

Difference Between Questionnaires and Schedules:

QUESTIONNAIRES	SCHEDULES
1. In this method the questionnaire is sent to respondents by post. The respondents have to fill the questionnaire without the researcher worker.	1. The Schedules are generally filled out by the enumerators, who can interpret questions when necessary.
2. Questionnaire method is relatively inexpensive.	2. Schedule method is relatively expensive as it requires enumerators to collect the information.
3. Non-response is usually high in case of questionnaire as some people do not respond and returns the questionnaire without answering all questions.	3. Non-response is generally very low in case of schedules because these are filled by enumerators.
4. This method is likely to be very slow since many respondents do not return the questionnaire in time.	4. In this method the information is collected well in time as they are filled in by enumerators.
5. In this method the personal contact is generally not possible.	5. In this method direct personal contact is established with respondents.
6. This method can be used only when respondents are literate.	6. This method can be used even when respondents are illiterate.
7. In this method there is a risk of collecting incomplete and wrong information, particularly when people are unable to understand questions properly.	7. In this method, the information collected is generally complete and accurate as enumerator can remove the difficulties faced by respondents.

7.6 Projective Techniques:

Projective techniques for collation of data have been developed by psychologists to use projections of respondents for inferring about motives, urges etc. Projective techniques play an important role in motivational researches or in attitude surveys.

“Projective techniques mean projecting ones internal feelings, attitude, emotions etc. to the external objectives.”

Characteristics:

- In projective techniques there is nothing right or wrong in the answer. Every answer is right.
- In projective techniques limited choices are not given to respondents. Respondents are free to write any answer as per his opinion.
- In projective techniques direct questions are asked to respondents. It is like an aptitude test.
- The researcher does not consider the actual answer of respondent. The researcher actually looked into the subconscious mind of respondent.
- The responses given by respondents are interpreted with the help of the experts.

7.6.1 Types of Projective Techniques:

Pictorial Techniques:

- A. In this test, some pictures are shown to respondents and on the answers of respondents, conclusion are drawn.
- B. **Thematic Appreciation Test (TAT):** In this test some 4-5 pictures are shown and respondents are asked to write down the story based on those pictures. Here the researcher tries to read the minds of respondents.

Verbal Techniques:

- A. **Story Completion Test:** In this only half story is given respondent is asked to complete the story.
- B. **Sentence Completion Test:** In this half sentence is given and respondent is asked to complete the sentence.

For e.g.

1. An effective manager is -----.
2. When I think about India, I think about -----.
3. A good teacher should be -----.
4. Online learning is -----

C. Word Association Test: These tests are conducted to collect information regarding such words which have maximum association. In this type the respondent is asked to mention the first word that comes to mind, ostensibly without thinking, as the researcher reads out each word from a list. For e.g. the word 'Profit' will be defined in different ways by management, trade union, shareholders etc.

D. Role Playing Test: In this type, the respondents are given different roles in indifferent situations and asked to play a role in that situation. The respondents' reactions in different situations are studied and the conclusions are drawn. These techniques are used for knowing the attitudes of children.

Advantages:

- People find it easier to express their feelings.
- This techniques provide extensive information about the psychology of the respondents,
- The researcher gets the real answers of the questions.

Limitations:

- In this type, the interpretation of the answer is difficult and specialized knowledge is required to interpret the answer.
- Projective techniques lack the objectivity because every respondent's answer is difficult.
- These tests can be used only when the respondents are small in number.

7.7 Collection of Secondary Data:

Secondary data means that data which is already available. It is a published data i.e. the researcher refers to the data which have already been collected and analysed by someone else. When the researcher refers secondary data, he has to look into various sources from where he can obtain them.

Usually published data are available in:

- Various publications of the central, state and local Governments.
- Various publications of foreign governments, international bodies and there subsidiary organizations.
- Technical and trade journals.
- Books, magazines and news papers.
- Reports and publications of various associations connected with banks, business and industry etc. FICCI, ASSOCHAM, MCCIA, MCA, IBA etc.
- Reports prepared by research scholars, universities, economics etc. in different fields.
- Public records and statistic historical documents and other sources of published data. Researcher must be very careful in using secondary data. He should make scrutiny of secondary data because it is possible that the data may be unsuitable or may be inadequate.

Characteristics of Secondary Data:

The researcher, before using secondary data, must see that they possess following characteristics:

- a. **Reliability of data:** The reliability of the data can be tested by finding out following things:
 - A) Who collected the data?
 - B) What were the sources of data?
 - C) whether they collected by using proper methods
 - D) At what time were they collected?
- b. **Suitability of data:** the data that are suitable for one research topic may not necessarily be suitable in the other research. Hence, if the available data are found to be unsuitable, they should not be used by the researcher.
- c. **Adequacy of data:** the data to be referred for the research should be adequate. The data is considered as inadequate, if the data are related to an area which may be either narrower or wider than the area of the present study. Such data should not be used by the researcher.

Sources of Secondary Data:

- A. **Published printed sources:** The credibility of various published printed sources depends on factors such as the author, publishing company, and the publication date. New sources are generally preferred over old ones, as newer technologies and research often bring new information to light.
- B. **Books:** Books cover a wide range of topics and are valuable resources for research. They are useful even before topic selection, providing insights into existing literature and helping in preparing the literature review.
- C. **Journals/Periodicals:** Journals are increasingly important for data collection due to their up-to-date information and focus on specific topics, which may not be covered in books.
- D. **Magazines and newspapers:** Magazines can be effective but are considered less reliable. Newspapers, on the other hand, are generally more reliable sources of information.
- E. **Published electronic sources:** With the advancement and accessibility of the internet, a wealth of information is now available online, including journals and books.
 - *e-Journals:* These are more commonly available than printed journals and can be accessed through e-libraries.
 - *General Websites:* While general websites are easily accessible, their content should be checked for reliability.
 - *Weblogs:* Weblogs, or blogs, are becoming more common but should be considered as reliable as personal diaries.

F. Unpublished personal records: Some unpublished data, such as diaries, letters, and government records, can also be valuable for research.

- *Diaries:* Diaries, though rare, can be valuable for descriptive research. The diary of Anne Frank is a well-known example.
- *Letters:* Like diaries, letters can provide rich sources of data.
- *Government records:* Government records, such as census data, health records, and educational institution records, are crucial for various research fields including marketing, management, and social research.

Advantages of Secondary Data

Following merits are usually claimed for using secondary data source.

- Provides an insight into total situation:** The purpose of use of available materials is to explore the nature of the data and the subjects to get an insight into the total situation. While looking for the data required by the researcher he may uncover many more available data than are often assumed to exist and hence, contributes significantly to the unfolding of hidden information.
- Helps in the formulation of hypothesis:** The use of documentary sources sometimes, helps in the formulation of research hypothesis. While an investigator may have one or two hypotheses which he might have deduced from theory, the study of available materials may suggest further hypotheses. If a research idea or hypotheses can be formulated in such a manner that the available recorded material bears on the question, the use of such material becomes possible.
- Helps in testing the hypotheses:** The available records may also help in testing the hypothesis.
- Provides supplementary information:** Available documents may be used to supplement or to check information gathered specifically for the purposes of a given investigation. For example, if one has drawn in random sample of a small group in order to interview individuals, the accuracy of one's sample could be checked by comparing socio-economic data of the sample, like income, education standard, caste, family size, etc., with the same data of the most recent census or with available data in local Government offices.

Disadvantages of Secondary Data

The following are the demerits of using secondary data source for research purpose.

- Collected for a specific purpose:** Data are often collected with a specific purpose in mind, a purpose that may produce deliberate or unintentional bias. Thus, secondary sources must be evaluated carefully. The fact that secondary data were collected originally for particular purposes may produce other problems. Category definitions, particular measures or treatment effects may not be the most appropriate for the purpose at hand.
- Old data:** Secondary data are by definition, old data. Thus, the data may not be particularly timely for some purposes.

- c. **Aggregation of data in inappropriate unit:** Seldom are secondary data available at the individual observation level. This means that the data are aggregated in some form, and the unit of aggregation may be inappropriate for a particular purpose.
- d. **Authenticity:** The authenticity of some secondary sources of data is doubtful.
- e. **Context change:** Secondary data refer to a given situation. As situations change, the data lose their contextual validity.

7.8 List of References:

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