

Data collection and analysis. (Quantitative, Qualitative and Mixed Methods).

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Objectives

- Differences in data collection in quantitative and qualitative research
- Major approaches to information gathering
- Collecting data using primary sources with examples (Observation, The interview, and The questionnaire).
- Collecting data using secondary sources
- How to analyze qualitative and quantitative data



Quantitative and Qualitative – what's the difference?

Definitions

Quantitative research

Quantitative data is information that can be counted or measured—or, in other words, quantified—and given a numerical value.

Qualitative research

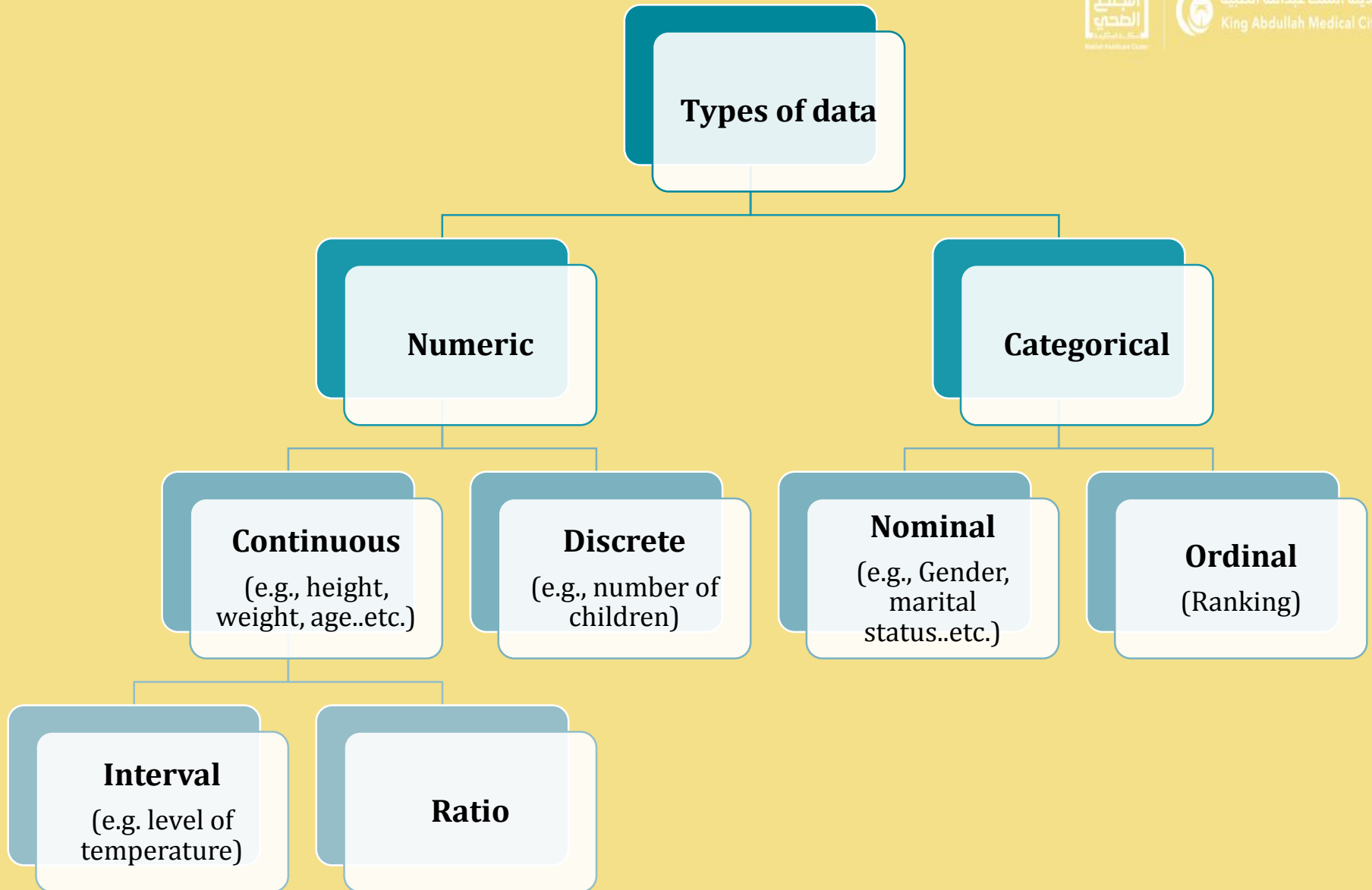
Is associated with words, sounds, feeling, emotions, colors and other elements that are non-quantifiable.



Data collection definition

- The process of gathering raw facts or evidence about a subject of interest in a systematic way, that enables one to answer stated research questions and evaluate outcomes.
- It can also be defined as gathering of information (figures, words or responses) that describes some situation from which conclusions can be drawn.





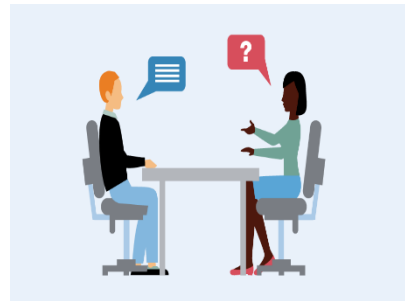
Methods of data collection

Observation

Interview

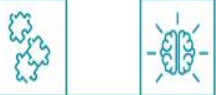
Questionnaire

Databases



Data collection methods and tools

- **Data-collection methods** allow us to **systematically** collect information about our objects of study (people, objects) and about the settings in which they occur.
- **Data collection tools** are instruments that are used hand in hand with the data collection methods to collect/retrieve data.



Data collection methods and tools

Methods	Tools
<ul style="list-style-type: none"> Administering written questionnaires. 	<ul style="list-style-type: none"> Questionnaire.
<ul style="list-style-type: none"> Interviewing 	<ul style="list-style-type: none"> Interview guide, checklist, tape recorder.
<ul style="list-style-type: none"> Observation 	<ul style="list-style-type: none"> Eyes and other senses, pen/paper, microscope.
<ul style="list-style-type: none"> Using available information 	<ul style="list-style-type: none"> Check lists, data compilation forms, databases.



Approaches to data collection

There are two major approaches for gathering information or data in scientific research

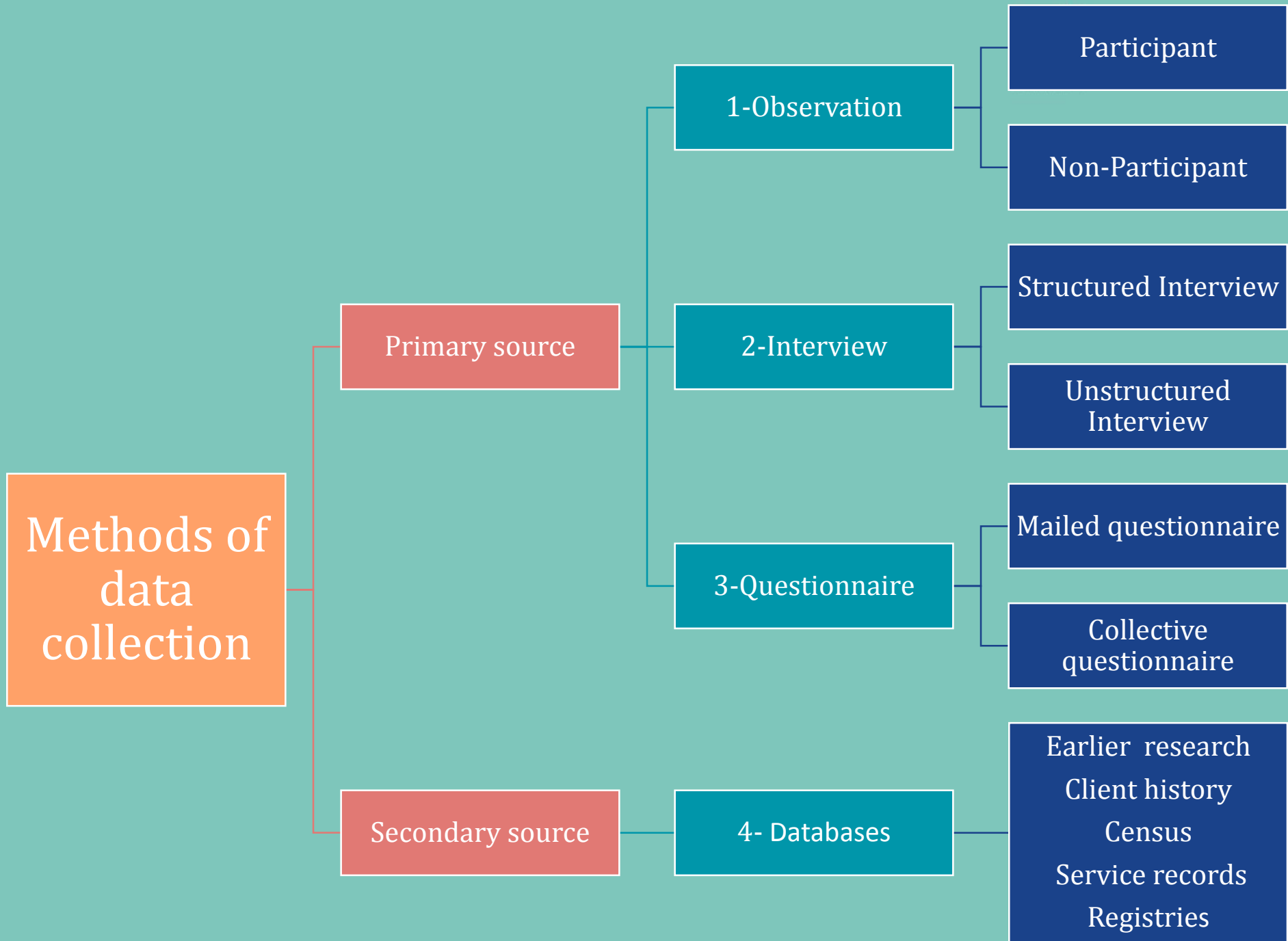
Primary data collection

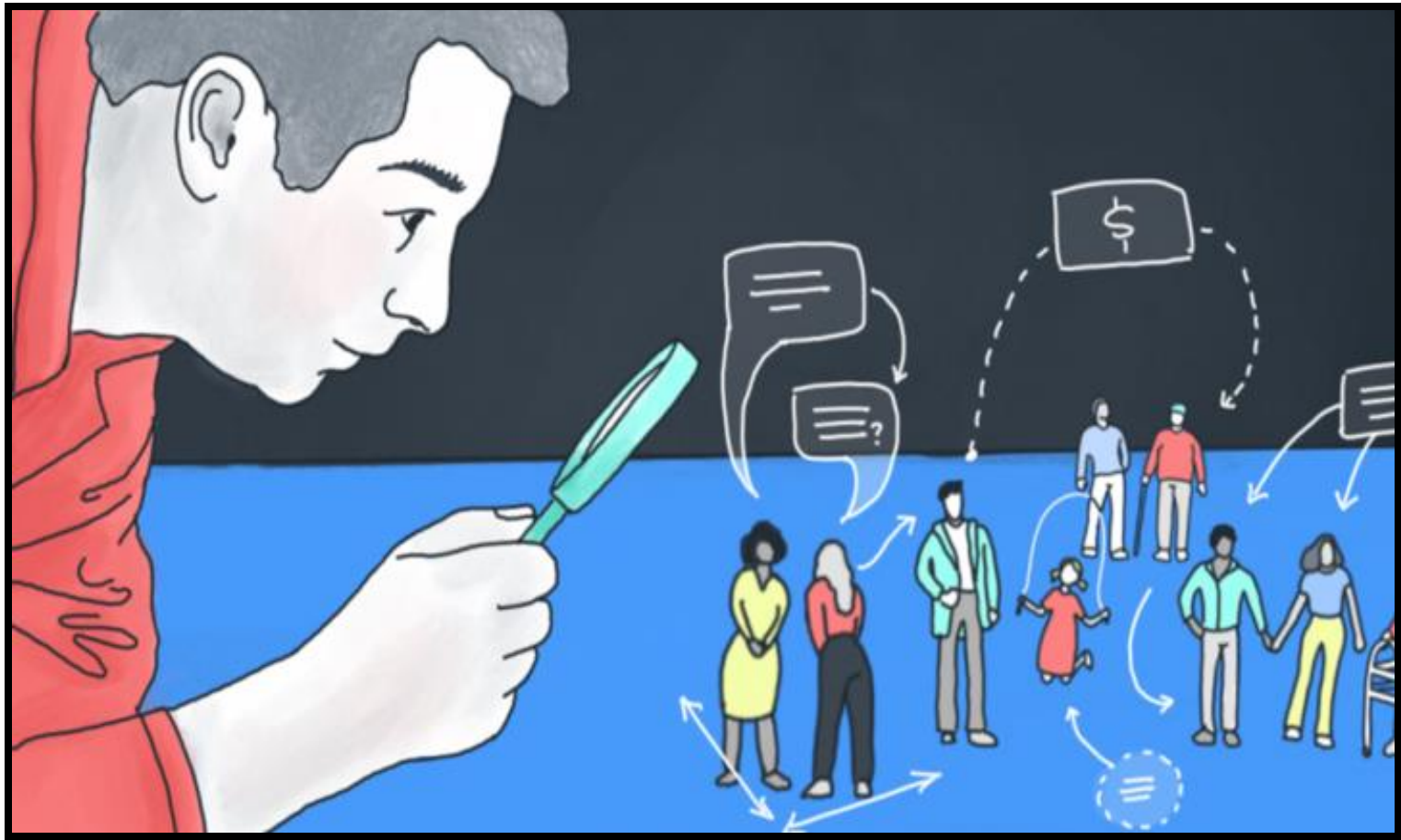
- Raw data that has been originally collected by the researcher specifically for the study at hand. the information must be collected fresh from field.

Secondary data collection

- Data that previously may have been collected for other purposes but can be used in the immediate study. required information is already available and need only to be extracted.







1.Observation

Observation is a purposeful, systematic and selective way of watching and listening to an interaction or phenomenon as it takes place.

Observation is the best approach to collect the required information when :

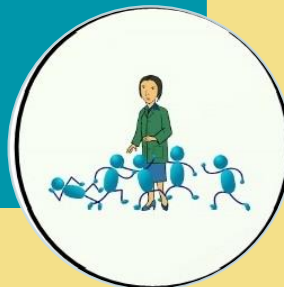
- The researcher interested in behavior than in the perceptions of individuals
- Subjects are so involved in the interaction that they are unable to provide objective information about it



Types of observation

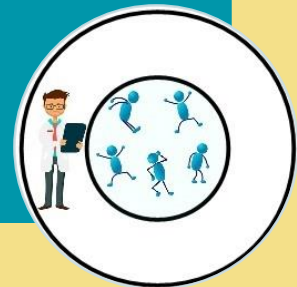
- Researcher, participate in the activities of the group being observed in the same manner as its members, with or without their knowing that they are being observed.

Participant observation



- Researcher, do not get involved in the activities of the group but remain a passive observer, watching and listening to its activities and drawing conclusions from this.

Non-participant observation



Observations can be made under two conditions:

Natural

- Observing a group in its natural operation rather than intervening in its activities.

Controlled

- Introducing a stimulus to the group to react to and observing the reaction.



Recording observations

Narrative recording

- Researcher records a description of the interaction in his/her own words.

Using scales

- Observers develop a scale in order to rate various aspects of the interaction or phenomenon.

Categorical recording

- Researcher records observation using categories.

Recording on electronic devices

- Observation can also be recorded on videotape or other electronic devices and then analyzed.

Problems with using observation as a method of data collection

When individuals or groups become aware that they are being observed, they may change their behavior (Hawthorne effect).

There is always the possibility of observer bias.

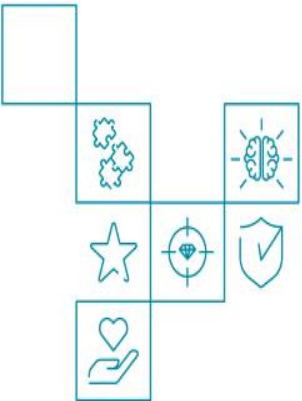
The interpretations drawn from observations may vary from observer to observer.

There is the possibility of incomplete observation and/or recording.



2- Interview

An interview is a verbal interchange, often face to face, though the telephone may be used, in which an interviewer tries to elicit information, beliefs or opinions from another person’.



Interviewing types

Unstructured Interviews

- Is the almost complete freedom provided in terms of content and structure.
- Flexibility in interview questions, content and structure

Structured interviews

- The researcher asks a predetermined set of questions, using the same wording and order of questions as specified in the interview schedule.
- An **interview schedule** is a written list of questions, open ended or closed, prepared for use by an interviewer in a person-to-person interaction.



Types of unstructured interview

In-depth interviewing

- Is 'repeated face-to-face encounters between the researcher and informants directed towards understanding informants' perspectives on their lives, experiences, or situations as expressed in their own words'
E.g. Interview with the Serial killer.

Focus group interview

- Interview undertaken with a group, to explore the perceptions, experiences and understandings of a group of people who have some experience in common with regard to a situation or event. **E.g. issues as domestic violence.**



Types of unstructured interview...cont

Narratives

- The person tells his/her story about an incident or situation and the researcher, listen passively. **about a person's personal experiences.**

Oral histories

- Involve the use of both passive and active listening. for learning about a historical event or for gaining information about a cultural, custom or story that has been passed from generation to generation. **E.g. the life after the Second World War**



Advantages of the interview

The interview is more appropriate for complex situations.

It is useful for collecting in-depth information.

Information can be supplemented.

Questions can be explained.

Interviewing has a wider application.

Disadvantages of the interview

Interviewing is time consuming and expensive.

The quality of data depends upon the quality of the interaction.

The quality of data depends upon the quality of the interviewer.

The quality of data may vary when many interviewers are used.

The researcher may introduce his/her bias.

The questionnaire

Rate your experience about using our products

Product packaging



Very Unsatisfied



Unsatisfied



Neutral



Satisfied



Very Satisfied

Product design



Very Unsatisfied



Unsatisfied



Neutral



Satisfied



Very Satisfied



The questionnaire

- A questionnaire is a written list of questions, the answers to which are recorded by respondents.
- In questionnaire respondents read the question, interpret what is expected and then write down the answers.
- Unlike an interview guide in which the researcher may explain the meaning of some questions, in the case of questionnaire, there is no one to explain the meaning of questions to respondents.
- Therefore questions in a questionnaire must be clear and easy to understand.



Ways of administering a questionnaire

Mailed questionnaire

- One approach to collecting information is to send the questionnaire to prospective respondents by mail.

Collective administration

- Obtain a captive audience such as students in a class room, people attending a function, or people assembled in one place.
- This ensures a high response rate

Administration in a public place

- Sometimes you can administer a questionnaire in a public place such as a shopping center, health center, hospital, or school.



Advantages of Questionnaires

Less expensive

Able to collect information from a larger sample

It offers greater anonymity.

Disadvantages of Questionnaires

Limited application.

Lack of opportunity to clarify issues.

Low response rate.

Possibility to consult others.

Spontaneous responses may not be possible mostly if it's a mailed questionnaire.

When to use a questionnaire?

- When resources and money are limited.
- When it is necessary to protect the privacy of the participants.
- When you want to collect data from a relatively bigger population.



LIKERT SCALE EXAMPLES

1



AGREEMENT

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

2



FREQUENCY

- Very Frequently
- Frequently
- Occasionally
- Rarely
- Never

3



IMPORTANCE

- Extremely Important
- Very Important
- Moderately Important
- Slightly Important
- Not important at all

4



INTEREST

- Very interested
- Somewhat interested
- Neutral
- Somewhat uninterested
- Very uninterested



Secondary data collection sources

Government or semi-government publications

- Collect data on a regular basis in a variety of areas and publish it for use by members of the public and interest groups.

Earlier research

- Research studies that have already been done by others can provide you with the required information.

Personal records

- Some people write historical and personal records (e.g. diaries)

Mass media

- Reports published in newspapers, in magazines, on the Internet

Points should keep in mind when using secondary sources

Validity and reliability

The validity of information may vary markedly from source to source.

Personal bias

The use of information from personal diaries, newspapers and magazines may have personal bias

Availability of data

Make sure that the required data is available before proceeding the study.

Format

Should be meeting the requirements of the problem. e.g. Units of measurement should be the same.



Advantages of Secondary Data

Ease of Access

Inexpensive

Time-Saving

Generating new insights

Disadvantages of Secondary Data

Data Quality

Irrelevant Data

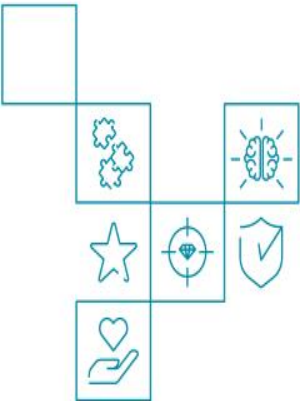
Exaggerated Data

Outdated Information

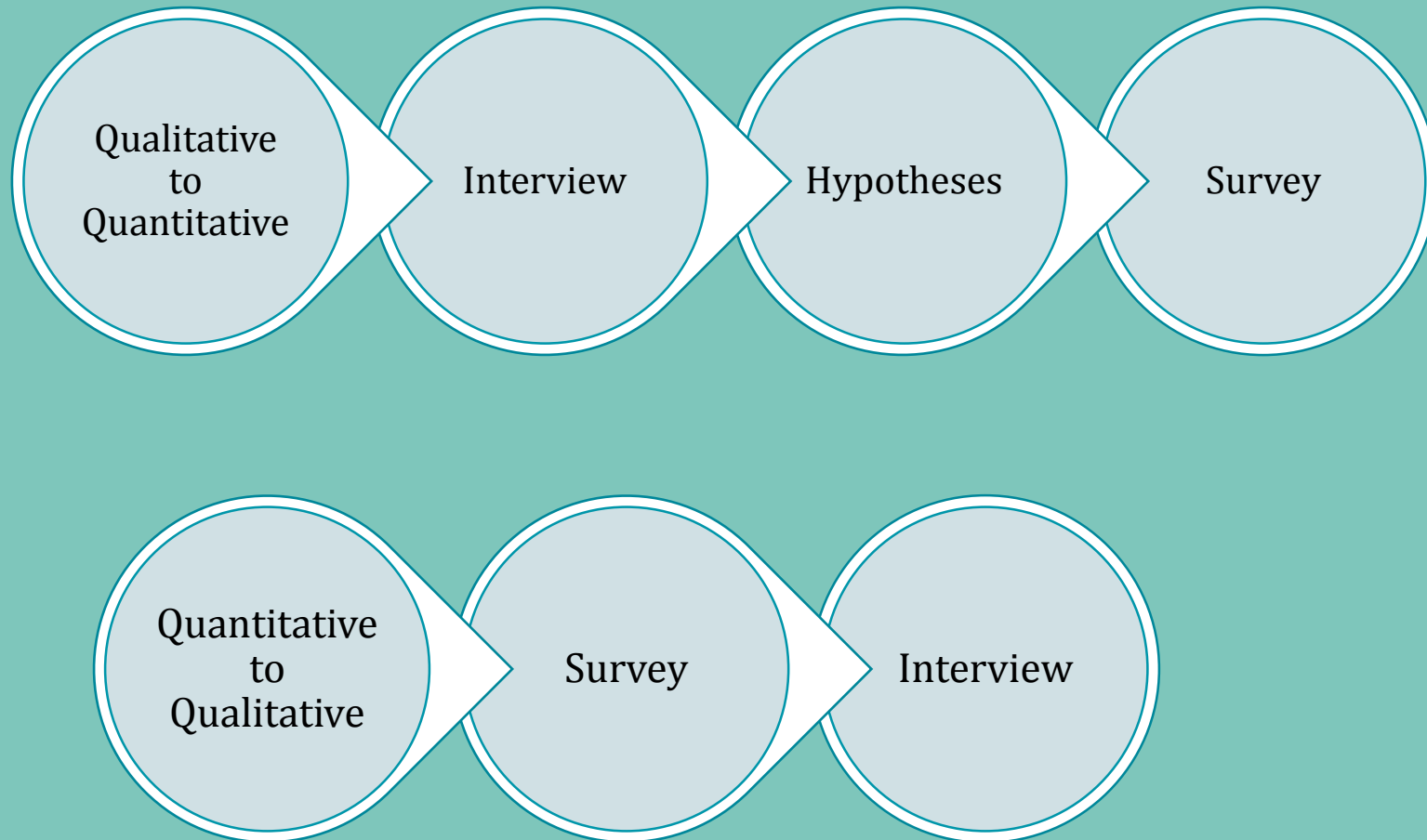


Mixed method

- Collect, analyze, and integrate both quantitative and qualitative data in a single study or in a sustained long-term program of inquiry to address a research questions.
- It is Used to gain a more complete understanding of research questions.

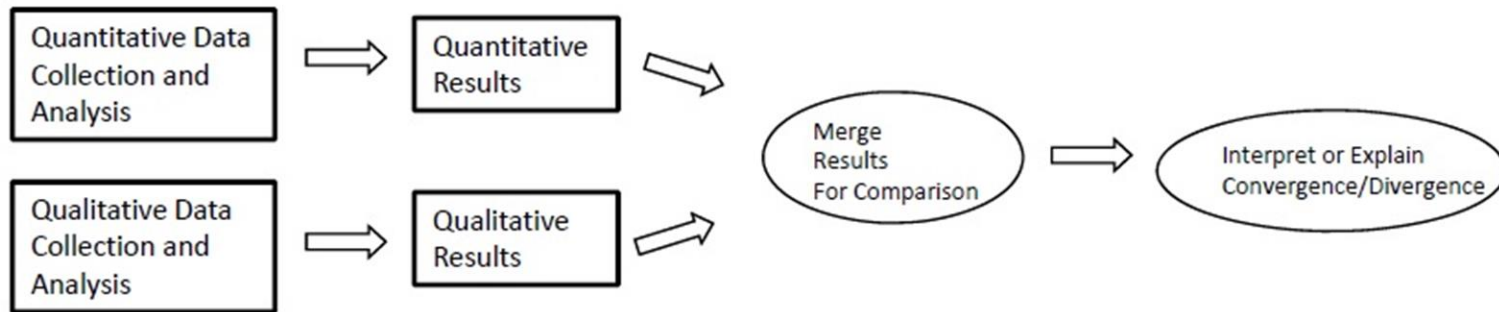


Examples of mixed method

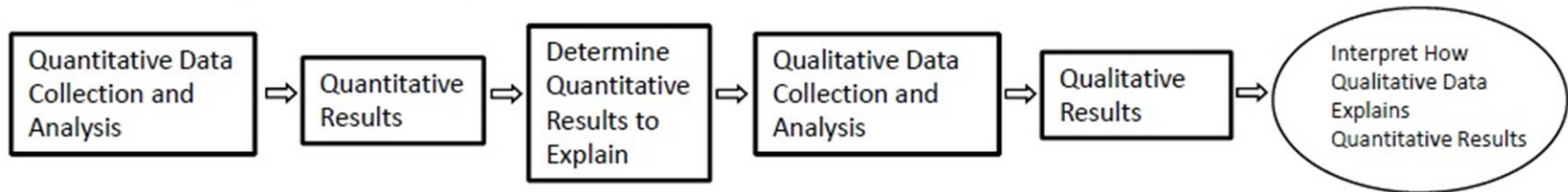


Mixed method designs

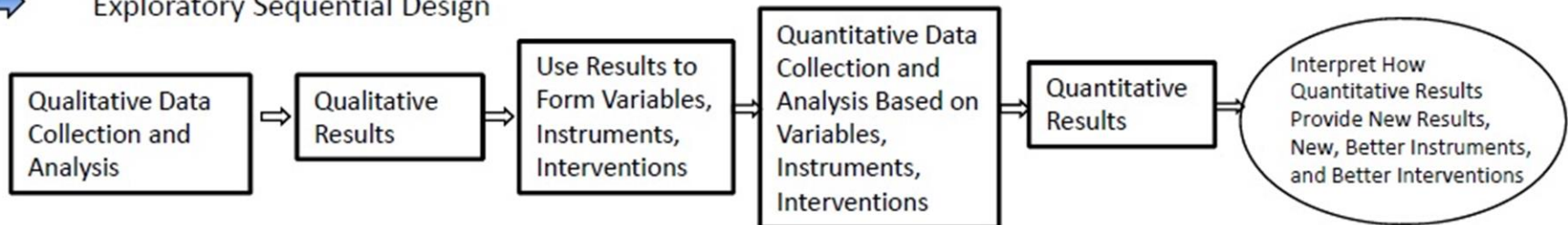
→ Convergent Parallel Design



→ Explanatory Sequential Design



→ Exploratory Sequential Design



Qualitative data analysis

Is the process of making sense of the collected data by:

- Identifying patterns and concepts to explain.
- Understand or interpret a phenomenon, situation or a people that is being investigated.
- It is the interpretation and examination of meaningful and symbolic data.



Types of qualitative data analysis

Content Analysis

- Categorizing verbal and behavioral data, based on description and interpretation.

Narrative Analysis

- Analyzing and revising narrated contents provided by different participants from different backgrounds and experiences.

Discourse Analysis

- Analyzing naturally occurring discourses and discussions of participants to rationalize their daily life with attention to the context and setting.

Framework Analysis

- This involves familiarizing, identifying a thematic structure, coding, charting, and mapping and interpreting.

Grounded Theory

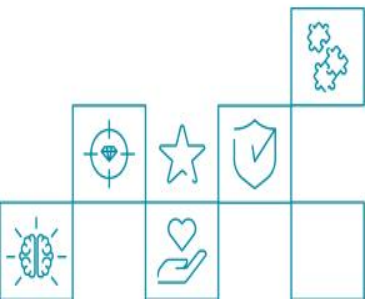
- This analysis involves formulation of a statement with each sample studied and carrying on until a common statement about a population emerges.

Quantitative data analysis

Analysed statistically through statistical programs by two main “branches” of statistical methods:

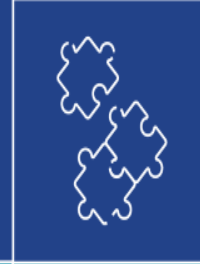
Descriptive statistics focus on describing the sample
Some common statistical tests (Mean, Median, Mode , Standard deviation...etc.)

Inferential statistics aim to make predictions about the population,
Some common statistical tests T-test, ANOVA, correlation analysis, regression analysis....etc.)





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شكراً لكم
Thank You



تقييم المدرية أ. أسماء المدني

