DATA COLLECTION METHODS

Prepared

By

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Introduction

Data collection involves gathering relevant data in order to achieve an answer to the problem stated

Definition of terms related to Data

- **Data:** It is a fact which is an observable and measurable phenomenon

- **Phenomenon:** It is any fact, circumstance or experience that is apparent to the senses and that can be scientifically described or appraised

- **Variable:** Phenomenon or attribute that needs to be measured It varies ; can be measured and quantified

Purposes of data collection

- To identify variables/ facts
- To measure variable/ phenomenon
- To describe behavior
- To obtain empirical evidence

Five 'W's of data collection

- 1.What data are to be Collected? – Consideration on type of data

- 2.From whom data s are to be collected?
 - Consideration of sample subject

- 3.Who will collect the data?- Training

- 4. From where the data will be collected? – Setting

- 5. When is the data to be collected- Consideration of time of collection

Levels of data

Nominal

Ordinal

Interval

Ratio
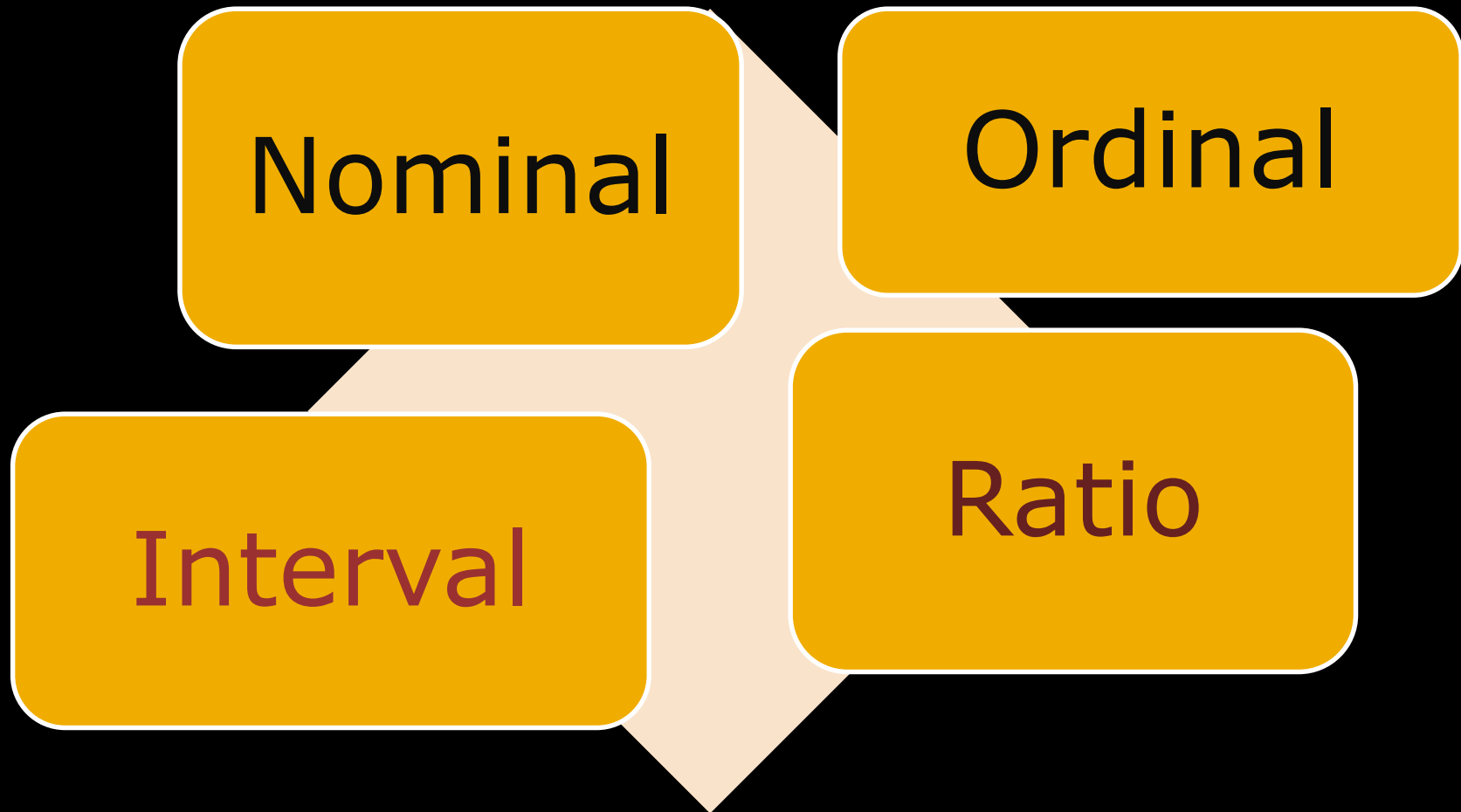
Nominal

1
- Data consist of different categories of a variable
- Each subject's response is placed in category

2
- No. of (subject) responses is summed to give percentage
- Also known as a " frequency count"

3
- Categories have no relative standing or order
- e.g., Sex. Colour of eye, type of diagnosis

Ordinal Data

▫ Data consist of categories of variable that are ordered or compared according to predetermined standard.

▫ Although there is no equal intervals between the categories but rank orders do have a relative order between categories. e.g.," fully agree", "partially agree", "do not agree"

▫ Ratio and interval data can be converted to ordinal level data according to the magnitude of scores

Ratio and Interval level data

Ratio and interval level data are continuous data and are highest level of measurement

- Represents quantity a subject has

It is a score which represents points on a continuum

- Ratio level is distinguished from interval level by having a true zero point

Sources of Data

1 PRIMARY SOURCES

- Which provide data gathered at first hand

- Data could be gathered by participant observation, personal interview, conference, questionnaire and other devices

2 SECONDARY SOURCES

- Which provide data that has been transcribed or compiled from original sources where the researcher is different from the authority controlling the collection of data. e.g., census is the primary source whereas health statistics on India based on census is a secondary data
- Should Scrutinize secondary source data

Sources of Data Contd.

3. FIELD SOURCE

- Personal sources- Living sources having fund of knowledge. Experience, is an expert in the state of art.
- Field source include environment, conditions, events that are observable and measureable, e.g., humidity, pollution,child birth

4. HISTORICAL DATA

- Is a combination of primary, secondary and field sources
- Consists of : documents, materials of cultural history, personal sources of authentic observers,
- Could be oral, written evidences , artifacts, etc.

Methods of Data Collection/ Modes of Measurement

1
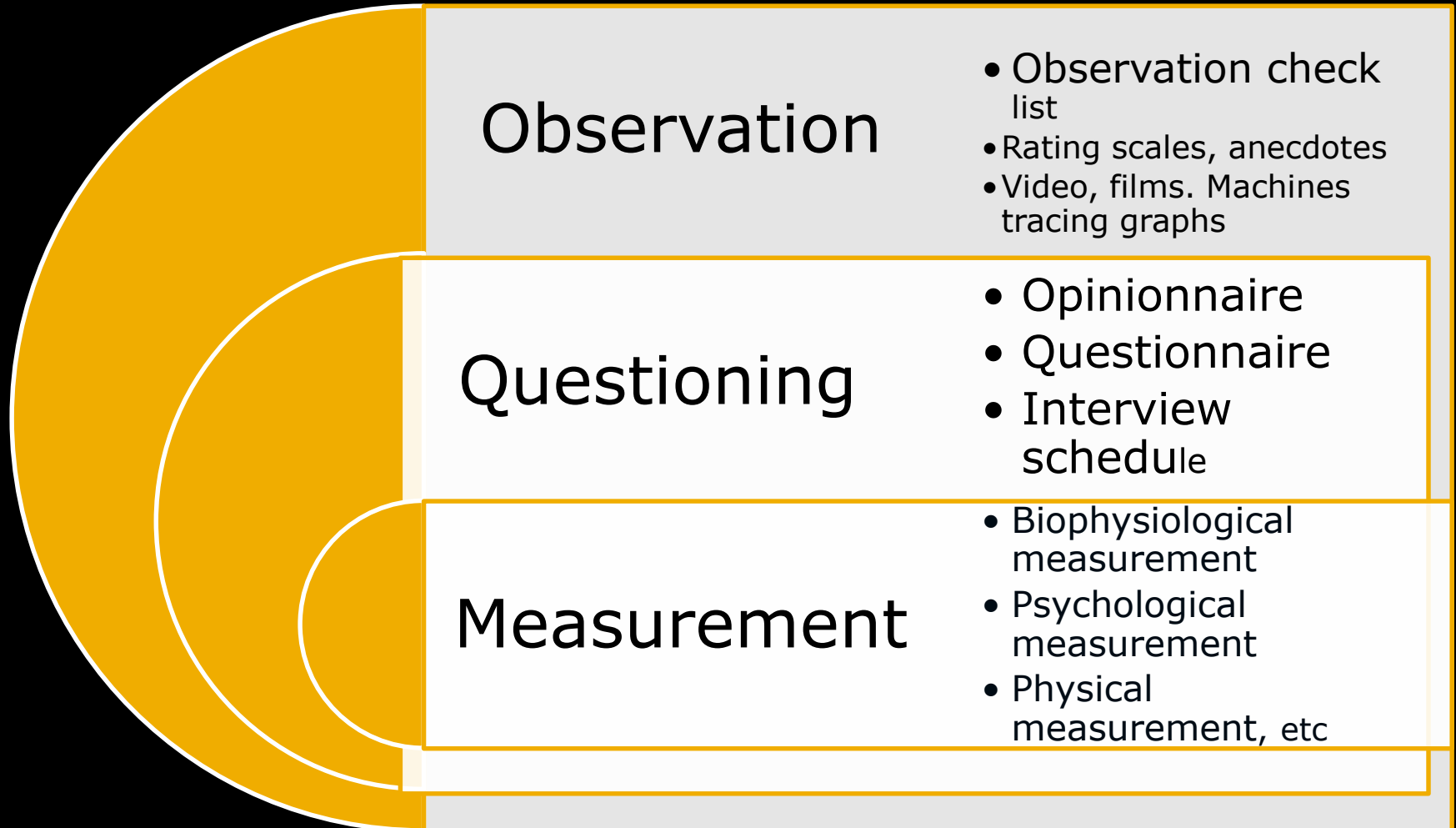- **Observation**- Observed through senses with or without devices

2
- **Questioning**- Self – reports , answers to written questions or oral interviews

3
- **Measurement**- physical, psychological, social, etc.
- **Others-** analysis of records, analysis of contents, Critical incident techniques

Techniques and Tools

|	
Observation	• Observation check list • Rating scales, anecdotes • Video, films. Machines tracing graphs
Questioning	• Opinionnaire • Questionnaire • Interview schedule
Measurement	• Biophysiological measurement • Psychological measurement • Physical measurement, etc

Characteristics of a Tool

1. **Validity**   ] Explained separately
2. **Reliability**   ]
3. **Sensitivity and appropriateness**: Refers to the capability to detect changes or differences when they do occur – multimodal measurements

    Appropriateness refers to whether or not the measure can be used for a particular target population

Characteristics continued.

4. **Reactivity**: The sources of possible measurement error associated with measures

- Measurement error may occur due to sudden noise, fatigue, hunger, excessive change of room temp. examples:

- Examiner or observer bias; subjects respond according to expectations of researcher; procedural artifacts; subject response bias

5. **Objectivity**; free from bias ; the score being independent of personal judgment.

Characteristics continued
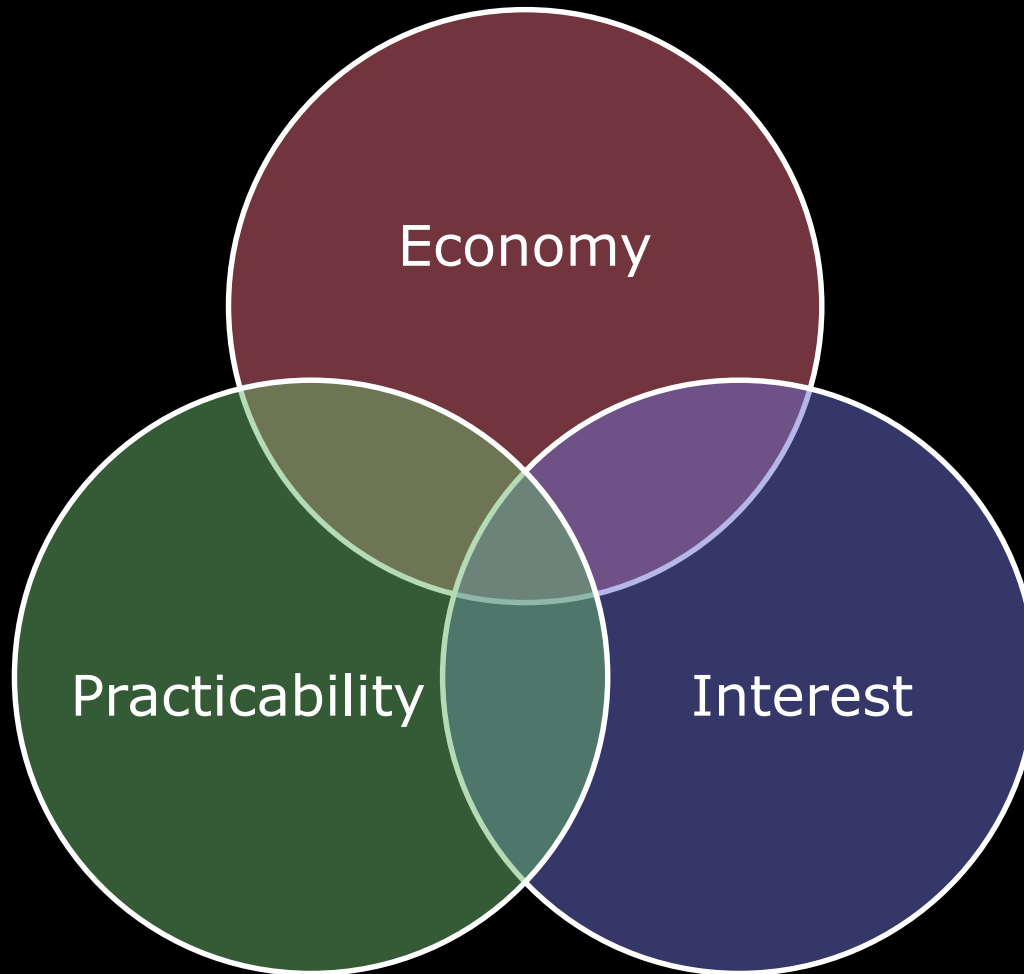
Standardized test

- Tests are developed after systematic testing
- Reliability and validity of test are established for known groups.
- Tests give average responses found in selected population(e.g. mean, percentile, SD)
- Norm-referenced testing- scores can be compared with appropriate norm
- Criterion-reference testing- It is an either-or, pass-fail approach in which specified target behavior, testing clinical skill among nursing students

Example of standardized tools

- Personality – MMPI – Minnesota Multiohasic Personality Inventory
- Aptitude- SAT – Scholastic aptitude test
- Intelligence – Stanford-Binet Test
- Projective Tests – TAT-Thematic Apperception test
- Socio-economic status- Shrivastava/, Parikh/, Kuppuswamy SES tests
- Child Growth- ICMR (Scale) norms

Questioning as a method of data collection

▫ Data are collected through self reporting which require some form of questioning. Questioning of subjects in a research project is accomplished through the use of a formal instrument which are :

Interview Schedule- an oral questionnaire

Questionnaire

Opinionnaire

Advantages

QUESTIONNAIRE

1. Simple, quick and inexpensive method
2. Time saving
3. Can cover large geographic area
4. Can remain anonymous
5. Structured tool –easy to test reliability and analyze
6. Good for quick exploring new area
7. Can be answered according to client's time

INTERVIEW SCHEDULE

- All are usable data
- Can get complete data
- In depth probe & analysis
- Offers clarity
- Greater control over sample
- Higher proportion of responses
- Offers flexibility-literacy no bar. Permits greater control over sample
- Get higher proportion of responses

Advantages Continued

QUESTIONNAIRE

- Offers simple procedure for new topics
- Respondents are allotted time to complete responses to each question
- Responses from closed items are easy to tabulate and score

INTERVIEW SCHEDULE

- Offers flexibility
- Suitable technique for probing sensitive issues
- Can be used on broader group of individuals-children, old and blind subjects
- Can get additional data through observation
- Telephones, videos can be used

Disadvantages

QUESTIONNAIRE

- Unable to probe in depth
- Incomplete responses
- Amount of information depends on respondents time and interest
- Printing, mailing may be costly
- Researcher can not interact
- Sample is limited to literate
- Difficult to follow up mailed questionnaire responses

INTERVIEW SCHEDULE

- Time consuming & costly
- Rapport is important- hence can be bias.
- Interviewer training is imperative in a large sample study- expensive
- Lack of objectivity when more than one interviewers collect data
- Recording may be biased, incomplete or selective
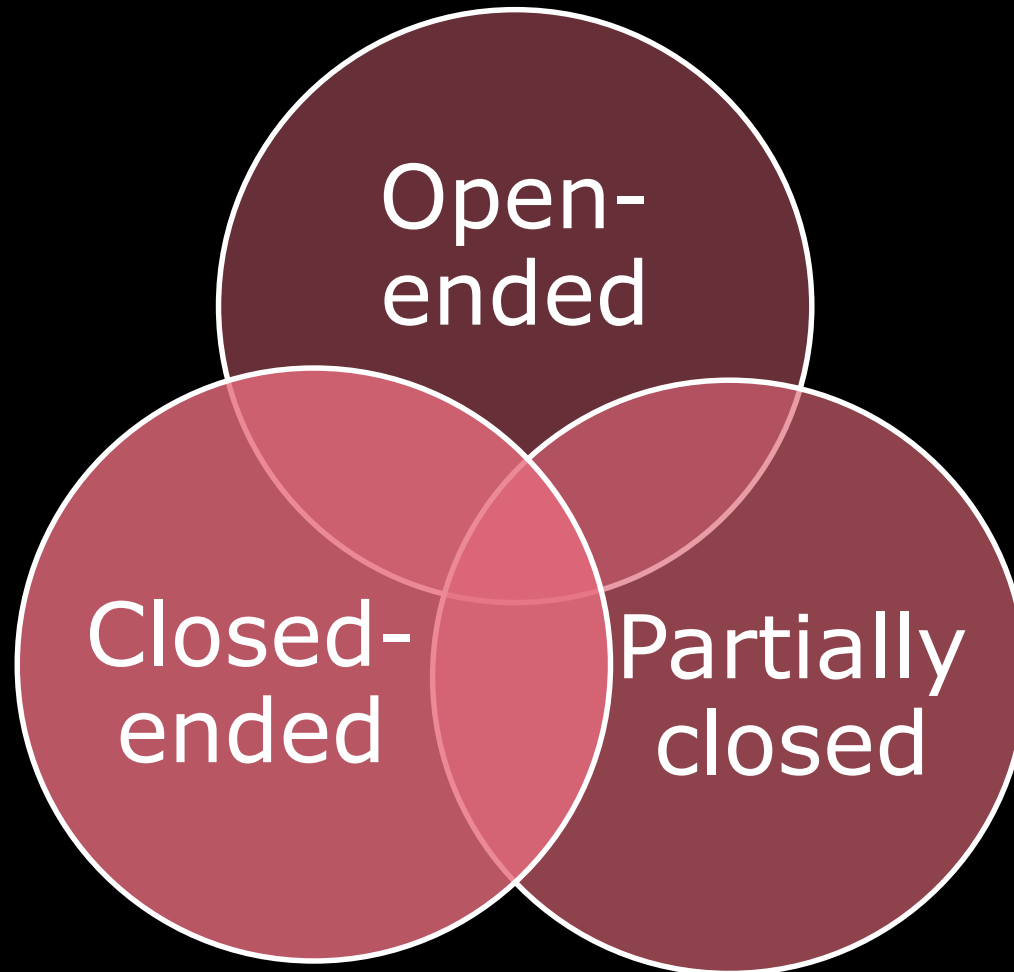
Steps in developing questionnaire
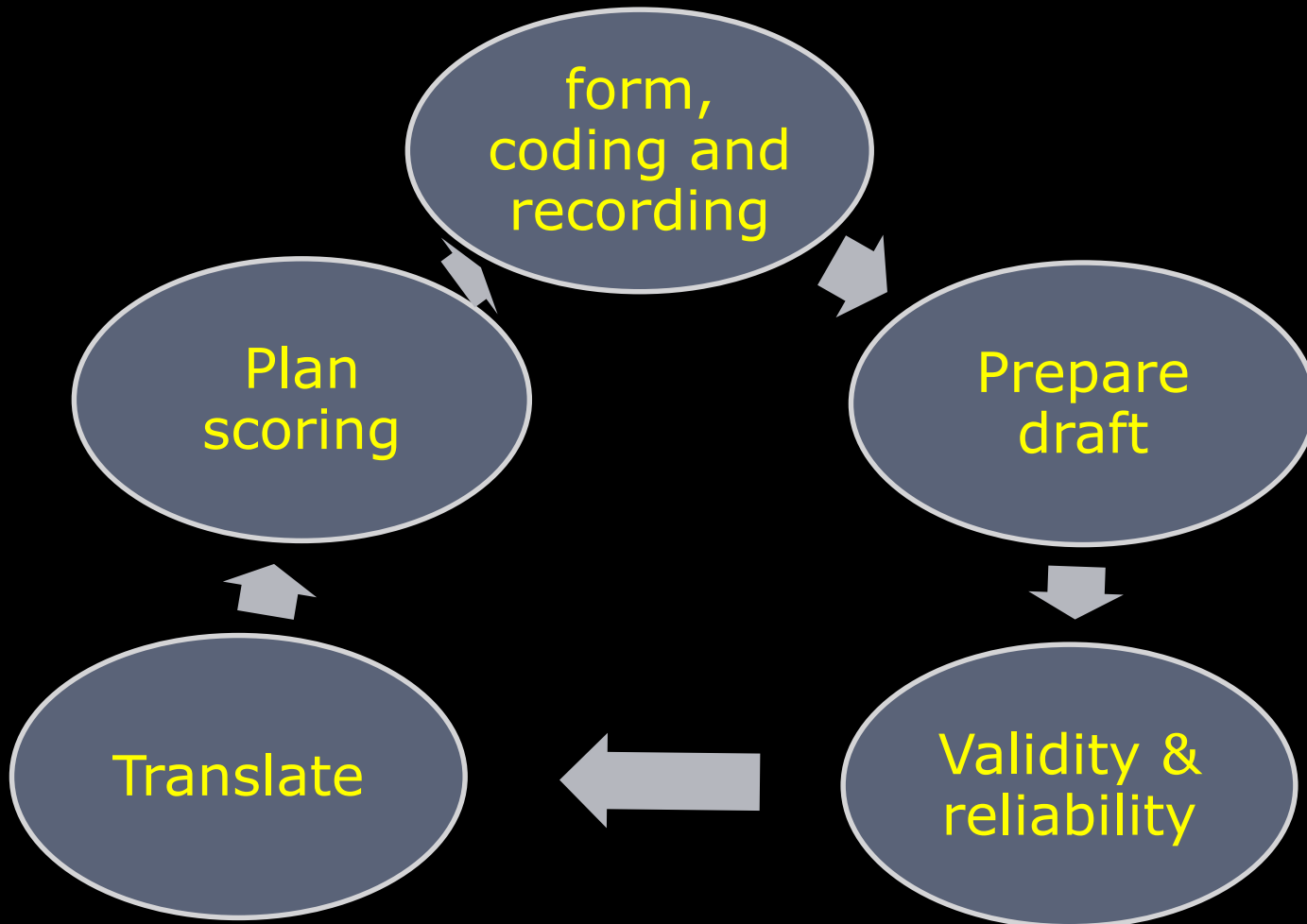
Form of Schedule
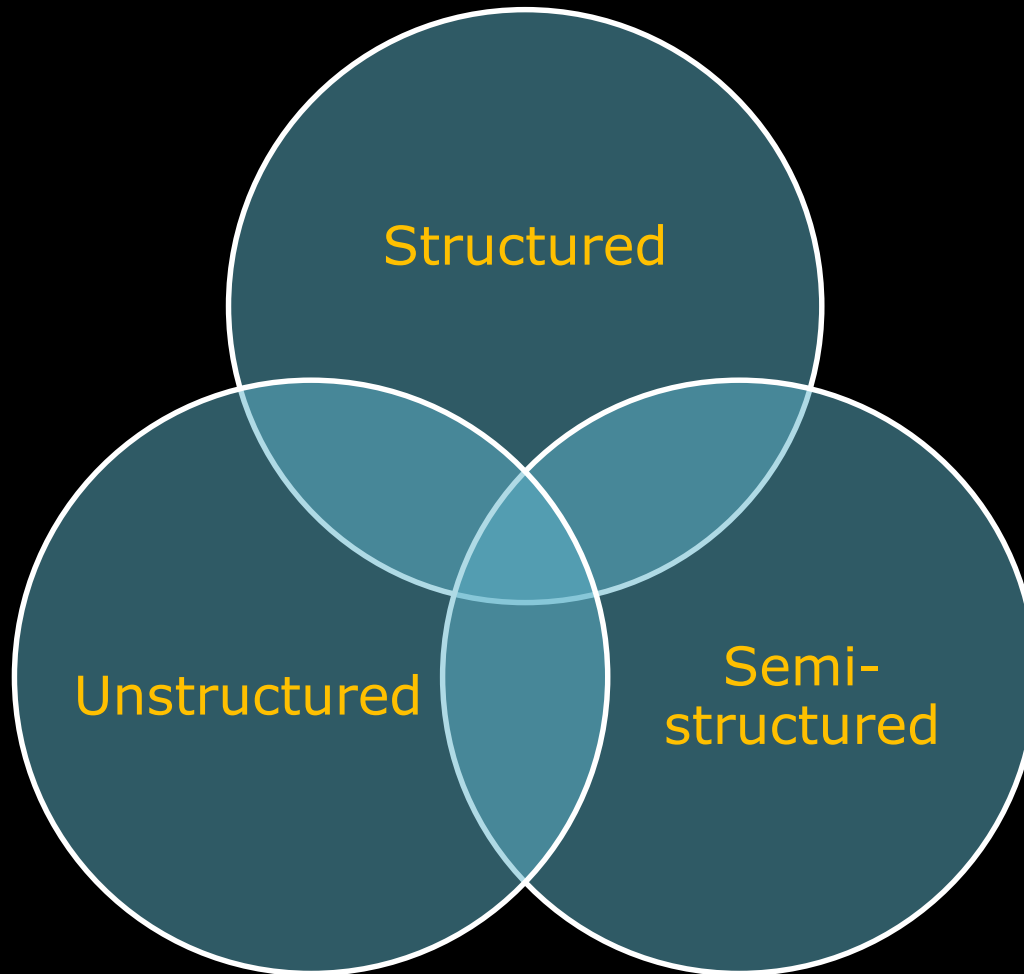
Form of questions

CLOSED ENDED

- Also called –fixed alternatives
- Offers fixed alternatives as yes/no or check an item from the list of responses
- Easy to fill by the respondents & easy to tabulate and score
- Disadvantage – limitation of responses

OPEN ENDED

- Questions have no answer choice
- Stimulates free thoughts
- Indispensible for exploratory study

  Disadvantages – Respondents may find it difficult to recall and express; not suited for mailed questionnaire; difficult for statistical analyses

Partially closed ended

- Provides a compromise
- Answer choices are provided but the respondents have the option of creating their own response
- Example: For what reasons you joined nursing
  (1) Like taking care of people
  (2) Was assured adequate income
  (3) Did not get admission in medicine
  (4) Please write any other reasons that is true in your case

Points to remember while constructing questions

- Question content
- Question wording
- Response alternatives
- Question sequence – organization
- Format / Lay out
- Introduction and instructions
- Writing good questions
- Administration- Self administered
  - mailed - monitoring

Interviewing

Types of interview

- **Standardized / Structured-**specific wordings can not be changed

- **Non-standardized /Unstructured** – Interviewers have complete freedom to develop each interviewing appropriate manner

- **Semi-standardized**

- **Focused-** Special is given on specific topics

- **Non-directive** – The subject is allowed an opportunity to relate personal feelings

General rules of interviewing

1. Fix up the appointment
2. Appearance
3. Be familiar with the format & follow question wording carefully
4. Record responses exactly
5. Probe if required
6. Train interviewer if necessary
7. Use words that can be easily understood (semantics)
8. Establish rapport

Observation

- Is a technique of collecting data through occurrences that can be observed through senses with or without mechanical devices

- It involves interpretation of phenomena in the environment ; Has two part process – **observer and the observed**

- **Questions to be asked:** 1. What should be observed?2. How should observation be recorded/ 3. What procedure should be used to assure accuracy? 4. What relationship exists between observer and the observed

Phenomenon amenable to observation

Conditions of Individuals	Activities
Verbal communications	**Non-verbal communication**
Performance /skill attainment	**Environment**

Observation Methods & Types

- **Methods**

1 Unstructured observation- use (i) logs and field notes (ii) Anecdotes

2 Structured observation-use(i) checklists,(ii) Rating scales(iii) category system

- **Types**

1. Participant / nonparticipant

2. Concealment / no concealment

Observation sampling Technique

1. **Time sampling method- Time frame chosen systematically.** Intermittent instantaneous. or Intermittent continuous at short interval

2. **Event sampling** – Observation of entire event that allows observation of all expected behavior

Steps in developing observation Schedule

- Selecting the behavior
- Defining the behavior
- Training the observer
- Quantifying observation
- Developing procedure to facilitate recording
- Testing observation schedule
  - Intra-rater reliability
  - Inter rater reliability

Advantages and Disadvantages

ADVANTAGES

- Necessary for studying human behavior where interventions are used
- Provides depth and variety of information
- All subjects are potential respondents
- Subjects are usually available
- Get first-hand information and sequence of events

DISADVANTAGES

- Observation & interpretation are demanding task
- Lack of consent to being observed
- Time & duration can not be predicted – waiting time
- Vulnerable to distortion because of researchers cultural background

Continued

ADVANTAGES

- ▣ All the data obtained are usable
- ▣ Most open to using recording devices
- ▣ One can make use of assistance

DISADVANTAGES

- ▣ Use of recording devices is expensive
- ▣ Extensive training of assistance is needed
- ▣ Threat to objectivity
  Halo effect
- ▣ Error of linency/ severity

Ethics

- Observation of human beings involves some ethical implications in terms of their

- Rights

- Willingness – voluntary participation

- Decide on sensitive questions prior to observation

- Informed consent – specially for old, unconscious, children and mentally ill patients

- Freedom from physical & psychological distress-