Business Research Methods

Quantitative research design

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Agenda

- To understand selected statistical methods and their application to business and management problems.
- To consider the philosophies associated with quantitative methods.
- To reflect upon research ethics, especially where collecting data from surveys.

Quantitative approaches

- Attempts to explain phenomena by collecting and analysing numerical data
- Tells you if there is a “difference” but not necessarily why
- Data collected are always numerical and analysed using statistical methods
- Variables are controlled as much as so we can eliminate interference and measure the effect of any change
- Randomisation to reduce subjective bias
- If there are no numbers involved, its not quantitative

Quantitative data

- Primary data collection

-Survey - Self-completion questionnaire (e.g. Likert scale)

Structured interview of large samples (closed-ended questions)

- Secondary data collection

-Secondary Data Analysis (run modelling by using database)

- Analysis techniques include hypothesis testing, correlations and regression analysis-determined by the type of measurement scale

Sampling overview

- Sampling terms
- Why sample?
- Sampling methods

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Sampling terms

- Sampling- it's the process of selecting units from a population of interest.
- Population-the full set of cases from which a sample is taken
- The target population is the total group of individuals from which the sample might be drawn.
- Sampling frame- is a complete list of all cases on the population from which your sample will be drawn.
- Sample-who is selected and responded?

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Sampling

Who do you want to generalize to?

The Theoretical Population

What population can you get access to?

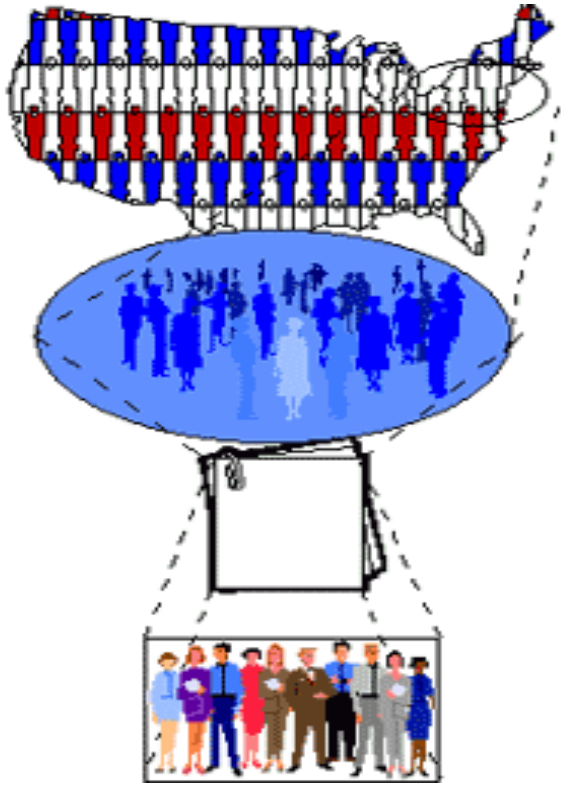
The Study Population

How can you get access to them?

The Sampling Frame

Who is in your study?

The Sample



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Why sample?

- Reduce time, cost.
- If the sample is representative, the sample data allows inferences to be drawn about the target population.

Sampling process

- Identify target population and sampling frame
- Select sampling method
- Calculate sample size

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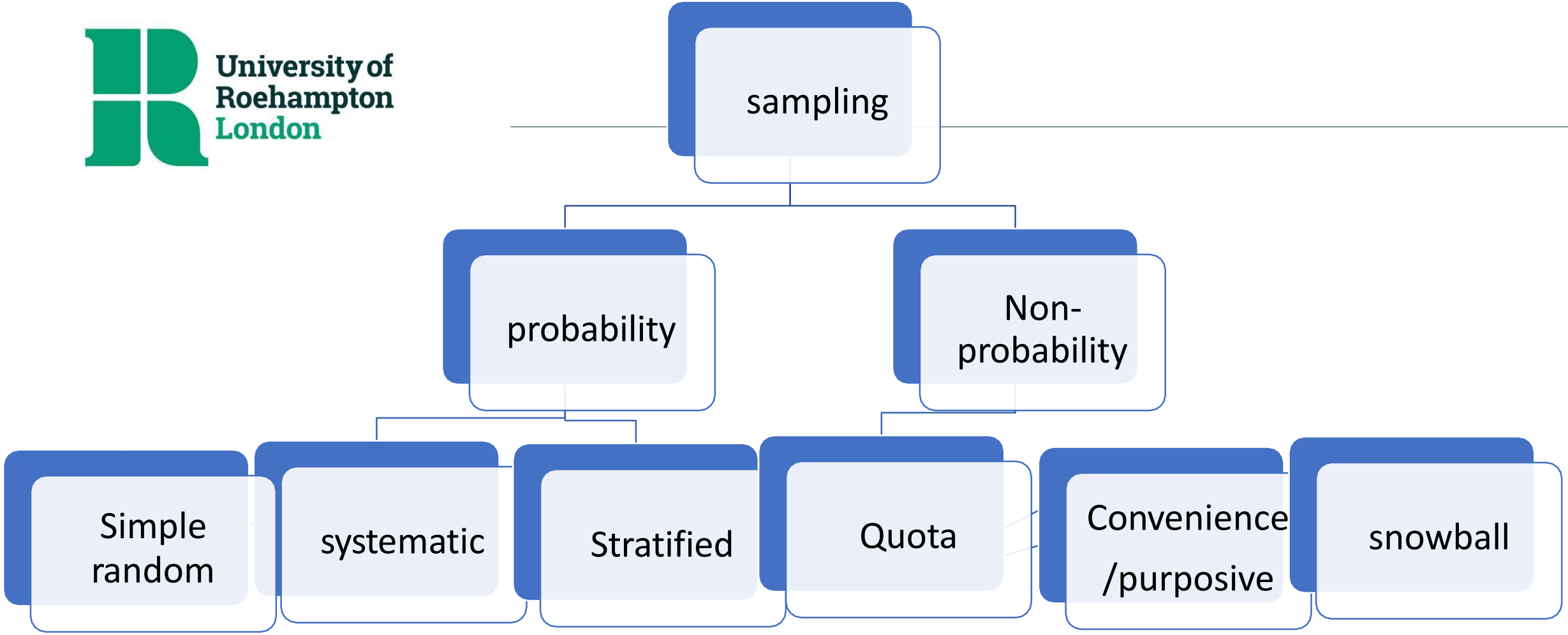

Simple random sampling (random sampling)

- Select the sample at random from the sampling frame using 1) random number tables 2) a computer 3) online random number generator

- 1. number each of the cases in your sampling frame -0,1,…and so on
- 2. select cases using random numbers until your actual sample size is reached.

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Systematic sampling

- Select sample at regular intervals from sampling frame
- 1. number each of the cases in your sampling frame -0,1,…and so on
- 2. select the first case using a random number
- 3. calculate the sampling fraction (actual sample size/total population)
- 4. select subsequent cases systematically using the sampling fraction to determine the frequency of selection.

Stratified random sampling

- Modification of random sampling –divide the population into two or more relevant strata
- 1. choose the stratification variable or variables
- 2. divide the sampling frame into the discrete strata
- 3. Number each of the cases within each stratum
- 4. select your sampling using either random or systematic sampling.

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Types of Non-Probability Sampling

- Convenience sampling
  - Easily accessible individuals
  - Useful when piloting a survey instrument
  - A chance to collect data that is too good to miss

- Snowball sampling
  - Researcher makes initial contact with a small group
  - Respondents introduce others in their network (e.g. Social Media)
    - *Bryman's (1999) sample of British visitors to Disney theme parks*
  - Useful for hard to find populations e.g. young widowers

Types of Non-Probability Sampling (Cont.)

- Quota sampling
  - Used in market research and opinion polls
  - Relatively cheap, quick & easily manageable
  - Proportionately representative of a population's social categories (*strata*)
  - But non-random sampling of each stratum's units:

Interviewers select people to fit their quota for each category, so the sample may be biased towards those who appear friendly and accessible (*e.g.* on the street), leading to under-representation of less accessible groups.

Sample Size

- The larger the sample, the more precise and representative it is likely to be
- As sample size increases, sampling error decreases
- Limitations in your sample (*e.g.* smaller sample than you initially planned) should be stated upfront

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Factors Affecting Sample Size

- Time and cost
  - after a certain point (e.g. n=1000), increasing sample size produces less noticeable gains in precision
  - very large samples are decreasingly cost-efficient (Hazelrigg, 2004)

- Non-response
  - response rate = % of sample who agree to participate (or % who provide usable data)
  - responders and non-responders may differ on a crucial variable
  - Some respondents might become disenchanted by a controversial item on your scale (pilot study can identify key issues in your measurement instruments)

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Factors Affecting Sample Size (Cont.)

- Heterogeneity of the population
  - the more varied the population is, the larger the sample should be
- Types of analysis to be carried out
  - some techniques require large sample (e.g. contingency table; inferential statistics, CFA/SEM)
- May depend on sampling method chosen
  - ➢ can be relatively small if random/representative

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- Sampling methods video

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Limits to Generalization

- Findings can only usually be generalized to the population from which sample was selected
  - Be cautious with over-generalizing (e.g. in terms of locality)

- Time, historical events and cohort effects
  - Results may no longer be relevant and require updating (replication)
  - Longitudinal studies or studies over a time period may corroborate findings (e.g. cause-and-effect relationships)

Errors in Survey Research

- Sampling error
  - Unavoidable difference between sample and population
- Sampling-related error
  - Inadequate sampling frame; non-response
  - Makes it difficult to generalize findings
- Data collection error
  - Implementation of survey instrument

  e.g. poor question wording. Piloting the survey instrument will test face/content validity and help you identify problematic items.
- Data processing error
  - Faulty management of data e.g. coding errors

Types of Surveys

- Self-Completion Questionnaires
  - Self-administered
    - Respondent completes a paper-based or an electronic form
    - Paper-based version can be done on-site under supervision, or returned by post
    - Electronically via email, online, social media, etc.

- Structured Interviews
  - Data has to be collected by interviewer(s)
  - Can be done face-to-face or by telephone, Skype, etc.

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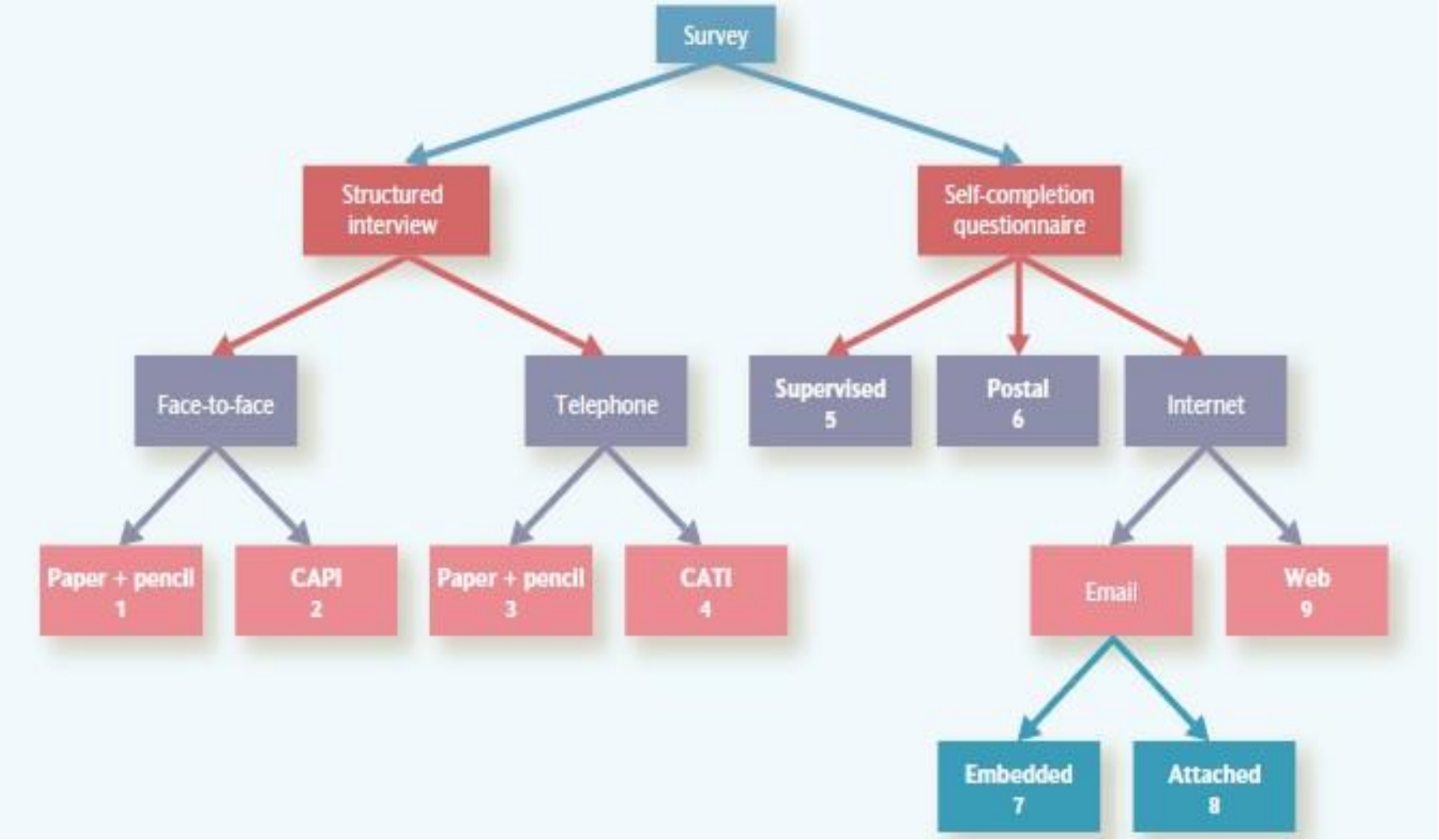
Survey Options



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Advantages of Self-Completion Questionnaires

- Cheaper and quicker to administer (to widely dispersed populations)
- No interviewer variability
- Convenient for respondents

Potential Disadvantages

- Cannot probe or ask impromptu questions
- Can only ask specific questions
- Few open-ended or complex questions
- Respondent can see the whole questionnaire before answering (question order effect)
- Cannot always ensure that the ‘right’ person answers
- Respondent fatigue if too many questions
- Excludes people with limited literacy skills
- Risk of missing data
- Lower response rates

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Tips for Designing Self-Completion Questionnaires

- Use an uncluttered layout
  - Not too cramped or too long
- Aim for clear presentation
  - Use consistent font sizes, styles, etc.
- Give clear instructions on how to choose an answer: tick, circle, underline, multiple choice, etc.
  - Not an issue if using a web-based survey
- Never spread a question over two pages
  - Locate the answers alongside each corresponding question, particularly for questions involving Likert scales.

Formatting a Likert Scale

In the next set of questions, you are presented with a statement. You are being asked to indicate your level of agreement or disagreement with each statement by indicating whether you: *Strongly Agree (SA), Agree (A),* are *Undecided (U), Disagree (D),* or *Strongly Disagree (SD).*

*Please indicate your level of agreement by **circling** the appropriate response.*

23. My job is like a hobby to me.
    SA A U D SD
24. My job is usually interesting enough to keep me from getting bored.
    SA A U D SD
25. It seems that my friends are more interested in their jobs. SA A U D SD
26. I enjoy my work more than my leisure time.
    SA A U D SD

Formatting a Likert Scale

In the next set of questions, you are presented with a statement. You are being asked to indicate your level of [illegible]t with each statement by indicating whether you: *Str[illegible]gree (SA), Agree ([illegible]ndecided (U), Disagree (D),* or *Strong[illegible]gree (SD).*

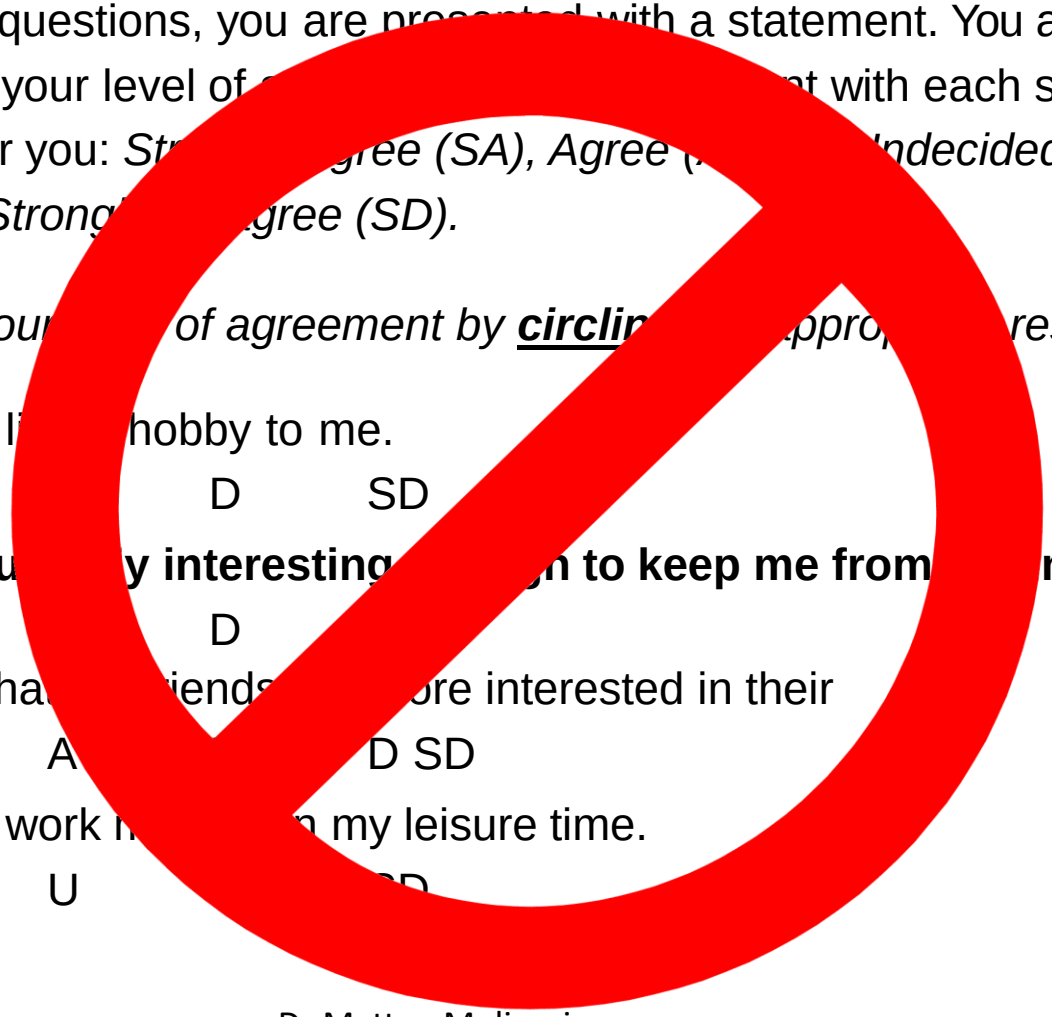
*Please indicate your [illegible] of agreement by **circlin[illegible]** [illegible]ppro[illegible] response.*

23. My job is li[illegible] hobby to me.
    SA A [illegible] D SD

24. My job is u[illegible]y interesting[illegible]gh to keep me from [illegible]ng bored.
    SA A [illegible] D

25. It seems tha[illegible]iends[illegible]ore interested in their jobs. SA A [illegible] D SD

26. I enjoy my work [illegible]n my leisure time.
    SA A U [illegible]D



Structured Interviews

- Often used in social surveys
- Standardized interview schedule
- All interviewees get the same questions in the same way and order
- Can include closed, pre-coded or fixed choice questions
- Minimizes variation between interviews
- Can be done in person or by telephone
- Can be technology-assisted:
  - Computer-assisted personal interviewing (CAPI) and telephone interviewing (CATI)
  - More efficient filtering of questions; immediate data entry

Telephone Interviewing

Advantages:

- Quick & cheap (no travel required)
- Easier to monitor/evaluate
- Reduces interviewer effect (no non-verbal cues)

Disadvantages:

- Some people do not own a telephone
- Limited time and difficult to build rapport
- Cannot capture or respond to non-verbal issues
- Sometimes less satisfying experience for interviewee

Conducting Structured Interviews

- Know your way around your own schedule
- Introduce your research
  - Spoken or written rationale
  - Identify yourself, purposes of research and interview procedure
  - Ethical issues:
    - Anonymity, confidentiality, right to withdraw
  - Opportunity for interviewee to ask questions

Conducting Structured Interviews (Cont.)

- Asking questions
  - Keep to schedule: Even small variations in wording can affect responses
- Question order
  - Every interviewee must get questions in same order
  - General questions before specific questions
  - Earlier questions should be directly related to the topic
  - More sensitive questions towards the end

Conducting Structured Interviews (Cont.)

- Recording answers
  - Write exact words used by interviewee, or use fixed choice questions
- Probing
  - When respondent does not understand question or gives insufficient answer
  - Non-directive probes: “mmm”, “can you say a bit more about that?”
  - Repeat fixed choice alternatives

Conducting Structured Interviews (Cont.)

- Prompting
  - Interviewer suggests possible answers
  - Show cards
- At the end of the interview
  - Thank the interviewee
  - Debriefing should be minimal

Designing Questions: General Rules

- Remember your research questions (RQ) & ensure your survey & interview questions relate directly to your RQs!
- Decide exactly what you want to find out
- Imagine yourself as a respondent
  - How would you answer the questions?
  - Identify any vague or misleading questions (pilot study)

Open Questions

- Advantages
  - Respondents' freedom to express themselves
  - Allow for new, unexpected responses and insight
  - Exploratory

- Disadvantages
  - Time-consuming for interviewer and respondent
  - Difficult to code
  - Potential interviewer variation in recording answers

Closed Questions

- Advantages
  - Quicker and easier to complete (better response rate & less missing data)
  - Easy to process data (pre-coded)
  - Easy to compare answers (inter-coder reliability)

- Disadvantages
  - Restrictive range of answers: No spontaneity
  - Difficult to make fixed choice answers exhaustive
  - Respondents may interpret questions differently

Common Pitfalls in Designing Questions

- Excessive use of open questions
- Excessive use of yes/no questions
- No instructions about how to choose an answer (tick box, circle?)
- Overlapping categories
- Ambiguous questions
- More than one answer may be applicable
- Answers do not correspond to the question

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Coding and Inputting Data

- After collecting your data, you need to enter it correctly or otherwise your findings will be incorrect.
- Responses from closed questions are easier to code and enter into a software package
- SPSS is usually used for the input and analysis of quantitative data
- When using SPSS
  - Plan out your codes before entering them in SPSS
  - SPSS is available under the All Programs list when you log in
  - You can download a free copy of SPSS for your laptop