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Survey Research and Design in Psychology

Lecture 2 - Survey Design

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A quick recap

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- Types of research
  - Experimental
  - Quasi-experimental
  - Non-experimental

A quick recap

- "What is the effect of pet ownership on happiness?"
- Think about a way to design and test this research question using each type of research

Purposes of research

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1) Information gathering

- Exploratory
- Descriptive

2) Theory testing

- Explanatory
- Predictive

Main pros and cons of surveys

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A survey is a standardised measuring instrument.

- Pros
  - Ecologically valid
  - Cost-efficient
  - Can obtain lots of data
- Cons
  - Low compliance
  - Reliance on self report

Focus/Overview for today

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1) The research process
2) Types of surveys
3) Survey design
4) Levels of measurement
5) Sampling
6) Biases

Survey administration methods

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- Self-administered
  - Postal
  - Delivered and collected
  - Online
    - Email
    - Mobile
    - Web
- Interview-administered
  - Phone
  - Face to face structured interview

Pros and cons

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- The pro of one approach is a con of the other approach
- Pros of self-administered surveys
  - Lower cost/time
  - Less demand characteristics
  - Access to a representative sample
  - Anonymity
- Pros of interview-administered surveys
  - Higher response rate
  - Higher data quality and richness
  - Can accommodate cultural awareness
  - Suitable for children/lower literacy

Survey construction

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- It's a science and an art
- Take it in steps: pre-testing and pilot testing is important
- Pay attention to structure, layout and flow

Steps to take

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1) Create a generic survey - have separate sections for each of your objectives
2) Expand it - draft questions and response formats, think about question order
3) Pre-test, pilot test, and redraft
4) Finalise survey and collect data

Pre-testing

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- Recruit a small convenience sample to pre-test your items
- Have them talk through their thoughts on each question and give feedback as they go

Pre-testing

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- Revise items when...
  - They don't apply to everyone
  - They are redundant
  - Thay are misunderstood
  - They are incomplete
- Reconsider ordering and layout

Pilot testing

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- Recruit a small sample from the target population
- Analyse the data
- Revise the survey

Structure of a survey

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- Title page
- Participant information sheet
- Informed consent
- Instructions
- Questionnaire (separated into sections with items relating each objective)
- End page - debrief

Things to consider

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- Keep it clear, simple and easy to navigate
- Use a large (e.g. 14pt), easy to read (non-serif) font
- High contrast
- Number each question
- Try to minimise the number of pages

Participant information

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- Name of your study
- Purpose of the study
- What is required from the participant
- Participation is **voluntary** and participants can withdraw at any time
- Risks/costs/rewards
- What you will do with the results
- Human ethics approval number
- How to make a complaint, obtain results, or contact the researcher

How to get informed consent

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- Active consent: Participants must indicate whether or not they consent to participate in the study
- Passive consent: Continuing onto the survey implies consent to participate

Ethical considerations

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- Informed consent
- Minimise risk of harm
- Confidentiality or anonymity
- No coercion
- Minimal deceit and full debrief
- Honour promise to provide the results
- Be aware of bias or conflicts of interest

Instructions

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- Important for ensuring consistency
- Few people read these without prompting!
- Explain how to do the survey in a really simple way
- Sometimes examples help make this clearer

Background information

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- Usually at the start or end of the survey
- Asks for personal information that are justified by the research question
- Also asks for demographic information to help judge how representative the sample is

Ordering questions

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- Start gently, so you're easing your participant in
- Group similar questions together
- Think about order effects!

What are order effects?

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- Habituation
  - Polarisation
  - Yea- and nay-saying (aquiescence bias)
  - Fix this by including both pro and contrait items
- Participant fatigue
  - Fix this using counterbalancing

Ending the survey

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- Space for comments?
- Thank your participants for their time!
- Instructions for submitting online/returning offline responses
- Debrief, including contact details for the researchers

Things to do

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- Be direct! Focus on your topic/issue, don't beat around the bush
- Be clear - use simple language, no big words
- Keep questions as short as possible

Things to do

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- Checked for similar surveys and use published scales where possible
- Only ask questions that relate to your research objectives
- All of your participants need to know your meaning - so define key terms if you have to

Things to do

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- Make sure your questions apply to everyone, or be clear about which to skip
- Response options must be exhaustive and mutually exclusive - so all participants will fit one box and no others
- Don't put unnecessary or excessive demands on recall

Things to avoid

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- Double barrelled questions
  - Questions that contain more than one concept or purpose should be avoided, as it is hard to know what part of the question they are responding to
  - Simplify these items, or split them into separate questions

Double barrelled questions

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- What should the speed limit be for cars and trucks?
  - What should the speed limit be for cars?
  - What should the speed limit be for trucks?

Double-barrelled questions

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- "Our country desperately needs a mighty leader who will do what has to be done to destroy the radical new ways and sinfulness that are ruining us"
- "Our prisons are a shocking disgrace. Criminals are unfortunate people who deserve much better care, instead of so much punishment"

— *Right-wing authoritarianism scale (Altemeyer 1981)*

Double-negative questions

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- "I never have to worry about not passing my units"
- Can also be created in the way participants respond
  - E.g. "I have never felt depressed"
  - "I am opposed to banning fireworks"
  - Responding "disagree" to the above creates a double negative and is confusing

Avoid both

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- Leading questions
  - Questions that suggest the answer the researcher is looking for
    - "What dangers do you see with fireworks?"
- Loaded question
  - Questions that suggest socially desirable answers, or are emotionally charged
  - "Do you support a ban on fireworks to improve animal welfare?"

Types of questions

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- Objective
  - A true answer exists
  - A participant theoretically can answer these questions accurately
- Subjective
  - Asking about personal perceptions
  - No ‘true’/factual answer, instead many possible answers
  - Participant cannot answer these questions accurately

Types of questions

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- Open-ended
  - Empty space for answer
  - Useful for gathering rich information
  - Good for descriptive and exploratory work
  - More difficult and subjective to analyse
  - Time consuming
- Closed-ended
  - Pre-set response options
  - Good for hypothesis testing
  - Easy, quick and objective to analyse
  - Participants are restricted to only the response options, so you might lose important information

Closed response formats

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- Dichotomous and multichotomous
- Multiple response
- Ranking
- Verbal frequency
- Likert
- Semantic differential
- Graphical
- Non-verbal

Dichotomous

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- Choose from two response options
  - Do you have any pets? Yes/no
- The simplest type of quantification (categorical/binary data)

Multichotomous

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- Choose from multiple response options
  - Which pet is most appealing to you?
    - Dog
    - Cat
    - Rodent

Multiple response

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- Choose all that apply
  - Which pets do you have?
    - Dog
    - Cat
    - Rodent

Ranking

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- Measure the relative importance of several items e.g. ranked voting on a ballot paper

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Verbal frequency

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- Over the past 12 months, how often have you thought about breaking up with your partner?
  - All the time
  - Fairly often
  - Occasionally
  - Never
  - Doesn't apply to me at the moment

Likert scale

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- Measures strength of feeling or perception
- Participants choose one option from equally-spaced intervals, between 3-9 points

Likert scale

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- Indicate the extent to which you agree or disagree with this statement
  - Fireworks should be banned
    - Agree
    - Disagree

Likert scale

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- Indicate the extent to which you agree or disagree with this statement
  - Fireworks should be banned
    - Agree
    - Neutral
    - Disagree

Likert scale

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- Indicate the extent to which you agree or disagree with this statement
  - Fireworks should be banned
    - Strongly agree
    - Agree
    - Disagree
    - Strongly disagree

Likert scale

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- Indicate the extent to which you agree or disagree with this statement
  - Fireworks should be banned
    - Strongly agree
    - Agree
    - Neutral
    - Disagree
    - Strongly disagree

Likert scale

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- Indicate the extent to which you agree or disagree with this statement
  - Fireworks should be banned
    - Strongly agree
    - Slightly agree
    - Agree
    - Disagree
    - Slightly disagree
    - Strongly disagree

Likert scale

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- Indicate the extent to which you agree or disagree with this statement
  - Fireworks should be banned
    - Strongly agree
    - Slightly agree
    - Agree
    - Neutral
    - Disagree
    - Slightly disagree
    - Strongly disagree

Likert scale

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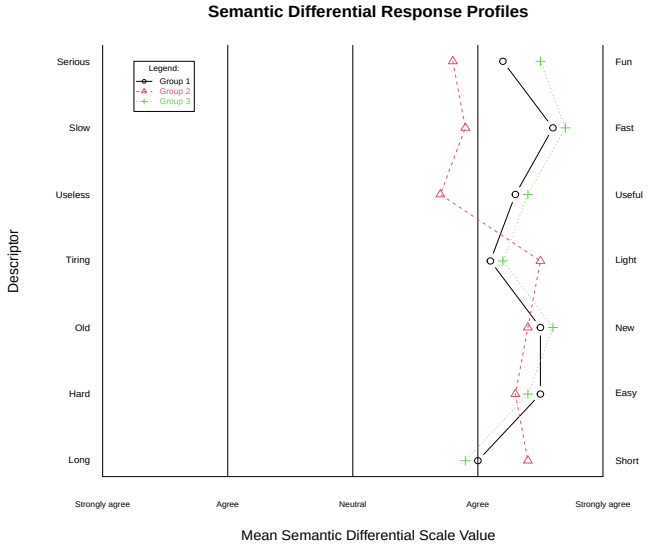
- Indicate the extent to which you agree or disagree with this statement
  - Fireworks should be banned
    - Very strongly agree
    - Strongly agree
    - Slightly agree
    - Agree
    - Disagree
    - Slightly disagree
    - Strongly disagree
    - Very strongly disagree

Likert scale

- How many response options should you choose?
  - At least 2, no more than 10. It's common to have between 3 and 9
  - Basic guide: 7 ± 2
  - Your scale should balance sensitivity (more categories) and reliability (fewer categories)
  - Notice that 'neutral' or midpoint options are available for odd numbers, but not for even

Sematic differential

- Put two words at opposite ends with interval marks



Graphical

- Mark your response with a cross on the line below

Introvert ———————————————————— Extrovert

Non-verbal

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- Point to the face that shows you how you feel about what happened to the toy

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Closed response formats

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- Dichotomous and multichotomous
- Multiple response
- Ranking
- Verbal frequency
- Likert
- Semantic differential
- Graphical
- Non-verbal

Pratice questions

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Identify issues and fix this survey item

- How old are you in years? (circle one response)
  - 18-20
  - 20-22
  - 22-30
  - 30 and older

Pratice questions

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Identify issues and fix this survey item

- How old are you in years? (circle one response)
  - 18-20
  - 20-22
  - 22-30
  - 30 and older

Some issues

- Categories are different sizes
- Participants fit in more than one category
- Not exhaustive (i.e. 17 years old)

Pratice questions

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Identify issues and fix this survey item

- How satisfied are you with your marriage and your job? Write your answer below

Pratice questions

UNIVERSITY OF CANBERRA

Identify issues and fix this survey item

- How satisfied are you with your marriage and your job? Write your answer below

Some issues

- Double barreled question
- May not apply to everyone

Pratice questions

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Identify issues and fix this survey item

- You didn't think the movie was very good, did you?
  - Yes
  - No

Pratice questions

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Identify issues and fix this survey item

- You didn't think the movie was very good, did you?
  - Yes
  - No

Some issues

- Leading question
- May have varying levels of enjoyment (strongly agree vs agree)

Pratice questions

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Identify issues and fix this survey item

- Environmental issues have become increasingly important in choosing hotels. Are environmental considerations an important factor when deciding on your choice of hotel accomodation?
  - Yes
  - No

Pratice questions

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Identify issues and fix this survey item

- Environmental issues have become increasingly important in choosing hotels. Are environmental considerations an important factor when deciding on your choice of hotel accomodation?
  - Yes
  - No

Some issues

- Loaded question

Levels of measurement

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- Nominal
  - Attributes are named
- Ordinal
  - Attributes are named
  - Attributes can be ordered
- Interval
  - Attributes are named
  - Attributes can be ordered
  - Distance is meaningful
- Ratio
  - Attributes are named
  - Attributes can be ordered
  - Distance is meaningful
  - True zero
- Each level (i.e. nominal $>$ ordinal $>$ interval $>$ ratio) can have the properties of the levels that came before, plus something more

Nominal

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- Conveys a category label
- The number is arbitrary, so provides no useful information beyond a label
- Also called categorical
  - E.g. cat vs dog person
  - E.g. People who smoke vs don't smoke

Ordinal

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- Conveys the order, but not the distance.
  - E.g. Positions in a race
  - E.g. Favourite foods

Interval

- Conveys order and distance but zero is arbitrary
  - E.g. Likert scale data (but controversial...)

Ratio

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- Conveys order and distance, with a meaningful 0 point
  - E.g. height, age, weight, time, number of times an event has occurred
- Continuous (so there can be fractional amounts, decimal places)
- Ratio statements can be made
  - E.g. X is twice as old/high/heavy as Y

Why should we care about the level of measurement?

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- Level of measurement is important because analytical procedures are used for different levels of data
- We can apply more powerful statistics to higher levels
- Think about these issues as you are designing a study - you can recode to a lower level of measurement, but never to a higher one

Summary of level of measurement

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- Nominal - numerical levels are arbitrary
- Ordinal - ordered numerical labels, intervals unclear
- Interval - ordered with equal intervals in between
- Ratio - continuous, with a meaningful 0

How level of measurement is represented in Jamovi

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- Nominal
- Ordinal
- Continuous
- ID
- Note - Interval/ratio are interpreted as the same data type (i.e. continuous)

Pratice questions

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Identify the level of measurement

- On average how many hours per week do you spend:
  - In paid employment?
  - In classes?
  - Studying outside of class?

Pratice questions

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Identify the level of measurement

- On average how many hours per week do you spend:
  - In paid employment?
  - In classes?
  - Studying outside of class?

Answer

- Ratio - zero point is meaningful

Pratice questions

UNIVERSITY OF CANBERRA

Identify the level of measurement

- How well do you think you have understood this lecture so far?
  - Perfectly
  - Very well
  - Reasonably
  - Poorly
  - Not at all

Pratice questions

UNIVERSITY OF CANBERRA

Identify the level of measurement

- How well do you think you have understood this lecture so far?
  - Perfectly
  - Very well
  - Reasonably
  - Poorly
  - Not at all

Answer

- Ordinal - but can be used continuously

Pratice questions

UNIVERSITY OF CANBERRA

Identify the level of measurement

- Rate your support or opposition to the following policy proposal:
  - Australians should ban animal testing on cosmetics
    - Strongly oppose
    - Oppose
    - Neutral
    - Support
    - Strongly support

Pratice questions

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Identify the level of measurement

- Rate your support or opposition to the following policy proposal:
  - Australians should ban animal testing on cosmetics
    - Strongly oppose
    - Oppose
    - Neutral
    - Support
    - Strongly support

Answer

- Interval

Pratice questions

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Identify the level of measurement

- What is your favourite animal out of the following:
  - Cat
  - Dog
  - Horse

Pratice questions

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Identify the level of measurement

- What is your favourite animal out of the following:
  - Cat
  - Dog
  - Horse

Answer

- Nominal

Sampling terms

- Target population - who do you want to generalise to?
- Sampling frame - who has a chance of being selected?
- Sample - who was selected and responded?
- Representativeness - to what extent is the sample a good indicator of the target population?

Why not select the entire target population?

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- Sampling reduces cost, time and sample size
- If the sample is representative, then you can still draw interferences about the target population from the data

Sampling process

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1) Identify - identify the target population and sampling frame
2) Select - select a sampling method
3) Calculate - calculate your sampling size
4) Maximise - maximise the return rate

Representativeness

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- Representativeness of sample demands depends on:
  - How adequate your sampling frame is
  - Your sampling method
  - Your sample size
  - Response rate - both the percentage of people you selected, and the representativeness of people in the sample who actually completed the survey

Response rate

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- Response rate is influenced by:
  - Potential participant's level of interest (self-selection biases may occur)
  - Rewards
  - Accompanying letter/introduction
  - Layout and design
  - Colour of paper
  - Reminders/follow up calls
  - Ease of returning survey e.g. self-addressed stamped envelope

Choosing a sample size

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- If there is no systematic bias, then the bigger the better
- However, if there is bias, and your sample is not representative, then having more participants only makes you more confident in making the wrong conclusions Haslam & McGarty (2018)
- Aim bigger (not everyone will do your survey)

Sampling methods

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- Probability sampling
  - Simple random
  - Systematic random
  - Stratified random
- Non-probability
  - Convenience
  - Purposive
  - Snowball

Probability sampling

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- Each member of the population has an equal chance of being selected
- Selection occurs by random chance

Probability sampling

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Simple random sampling

- Everyone in the target population has an equal chance of selection
- Similar to a lottery:
  - Assign numbers to a list of names, then randomly select numbers for the sample
  - Can use computer-generated random numbers, or a table

Systematic random sampling

- Respondents are selected from a list (e.g. of students) at regular intervals
- Choose a random number between e.g. 1 and 6, then choose every e.g. 3rd person from the list

Probability sampling

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Stratified random sampling

- Sub-divide the population into strata (e.g. gender, age, location)
- Randomly select from within each stratum
- This helps to improve representativeness
- E.g. phone interviews using post-code strata

Non-probability sampling

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- Useful for exploratory research or case studies
- Can get a large sample size quickly
- Sample is subject to selection bias, might not be representative

Non-probability sampling

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Convenience sampling

- You choose whoever is convenient (nearby/available), rather than choosing at random
- E.g. surveying visitors to a tourist attraction over one weekend
- Cheaper and faster
- Subject to sampling bias

Non-probability sampling

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Purposive sampling

- Have a specific reason for choosing participants - e.g. picking ‘typical’ respondents

Non-probability sampling

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Snowball sampling

- Asking your participants to recommend other people to try and recruit
- Great for difficult to access populations e.g. illegal immigrants and people who engage in drug use

Summary of sampling

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- Learn the key terms: target population, sampling frame, sample
- Probability sampling: simple, systematic or stratified
- Non-probability: convenience, purposive or snowball

Biases in survey research

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- Sampling biases - when the sample is not representative of the target population
- Non-sampling biases - problems with measurement tool (reliability and validity) or response biases

Response bias

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- Acquiescence bias - yea- and nay-saying
- Order effects
- Demand characteristics
- Self-serving bias
- Social desirability
- Hawthorne effect

For you to think about - survey item design

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- Create some items to measure extroversion
- Try and come up with at least one item using each of the response formats!
  - Dichotomous and multichotomous
  - Multiple response
  - Ranking
  - Verbal frequency
  - Likert
  - Semantic differential
  - Graphical
  - Non-verbal

For you to think about - survey administration

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- How would you administer a survey on...
  - Prejudice and discrimination?
  - Children's favourite toys?
  - Experiences of individuals living in remote areas?
- Most importantly, justify your answers!

For you to think about - sampling methods

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- How would you recruit participants for a study on...
  - Ecstasy use among students?
  - Comparing cognitive abilities of pregnant and non-pregnant women
  - Polling Australian's voting intentions?
- Most importantly, justify your answers!

Next week - descriptives and graphing

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- Getting to know a data set
- Levels of measurement and types of statistics
- Descriptive statistics
- Normal and non-normal distribution
- Effect of skew on central tendency
- Principles of graphing
- Univariate graphical techniques

Contributions to this course

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Dr James Neill

Dr Samantha Stanley

Dr Jeroen van Boxtel

References I

Haslam, S. A., & McGarty, C. (2018). *Research methods and statistics in psychology*. https://www.torrossa.com/gs/resourceProxy?an=5018329&publisher=FZ7200