# Survey Design

## Lecture 2

Survey Research & Design in Psychology

James Neill, 2018



## Overview

1 Lecture 1 summary
2 Survey administration methods - Interview vs. self-administered
3 Survey construction
4 Levels of measurement
5 Biases
6 Sampling

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## Lecture 1 Summary Survey research

**1 Research types (3)**
- **1 Experimental**
- **2 Quasi-experimental**
- **3 Non-experimental**

**2 Purposes (4)**
- **1 Information gathering (2)**
  - 1 Exploratory
  - 2 Descriptive
- **2 Theory testing (2)**
  - 1 Explanatory
  - 2 Predictive

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## Lecture 1 Summary Survey research

**1 What is a survey?**
- **1 A standardised stimulus used as a social science measurement tool**

**2 Survey research**
- **1 Pros**
  - 1 Ecological validity
  - 2 Cost-efficient
  - 3 Can obtain lots of data
- **2 Cons**
  - 1 Low compliance
  - 2 Reliance on self-report

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# Survey administration methods

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## Survey administration methods

What are the pros and cons of two **survey administration methods:**

1. Interview-based
2. Self-report

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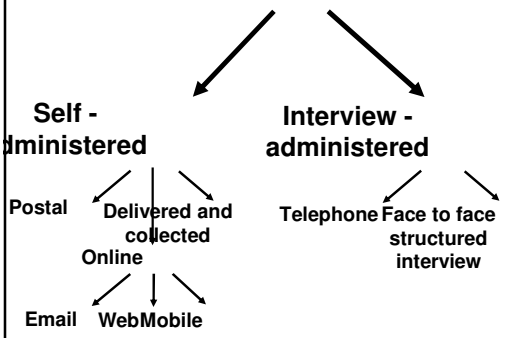
## ey admin methods

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Advantages and disadvantages of self- and interview-administered surveys

| # | Aspects of survey administration | Type of survey: Self-administered survey | Type of survey: Interview (f2f or telephone) |
|---|---|---|---|
| 1 | Data collection and data entry cost and time | **Low** | High |
| 2 | Demand characteristics | **Low** | High |
| 3 | Risk of non-response and low response rate | High | **Low** |
| 4 | Access to a representative (and possibly widely dispersed) sample | **High** | Low |
| 5 | Data quality and richness per participant | Low | **High** |
| 6 | Anonymity | **High** | Low |
| 7 | Adjustability to accommodate cultural differences | Low | **High** |
| 8 | Suitability for young children or others with low literacy levels | Low | **High** |

## Survey administration methods

**Self-administered**

Opposite for interview-administered surveys

- **Pros**:
  - Cost
  - demand characteristics
  - access to representative sample
  - anonymity
- **Cons**:
  - Non-response
  - adjustment to cultural differences, special needs

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# Survey construction

## Survey construction

The nuts & bolts of **questionnaire design** include:

1. Questionnaire development
2. Question styles
3. Response formats

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## Survey construction

1. Survey design is science and art
2. Questionnaire development
   1. Stages of development
   2. Parts of a survey
   3. Order, flow and structure
   4. Demographics and personal information
   5. Ending the survey
   6. Layout
   7. Pre- and pilot-testing
3. Writing questions
   1. Types of questions
   2. Response formats

## Survey design is a science and an art

"Surveys are a mixture of science and art, and a good researcher will save their cost many times over by knowing how to ask the correct questions."

- Creative Research Systems (2008)

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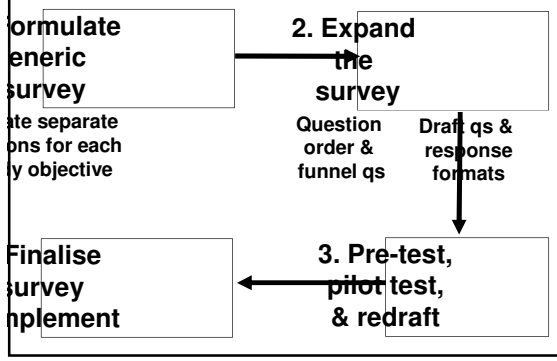
## Stages of survey development

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## Parts of a survey

- Title page
- Participant information
- Informed consent
- Instructions
- Questionnaire structured into sections which contain measurement items relating to each objective
- End page(s)

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## Survey layout

- Layout - clear, simple, easy to navigate
- Readability:
  - Large font size (14 pt) and clear (non-serif) font type
  - High contrast e.g., avoid text in coloured boxes, etc.
- Minimise the number of pages
- Logical flow/order
- Number each question

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## Participant information

Summarise important details e.g.,:

- Name of the study
- Who are the researchers? (Are they bona fide)?
- Purpose of the study?
- What's required of participants?
- Voluntary nature of participation
- What are the risks/costs/rewards?
- How will results be used?
- Human ethics approval #?
- More info: Making a complaint, obtaining results, contacting the researcher etc.

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## Informed consent

- **Active consent**: Participants indicate whether or not they consent to participate in the study
- **Passive content**: If participant consents, continue with survey, otherwise hand back or close screen

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## Ethical considerations

- Informed consent
- Minimise risk of harm to respondents
- Confidentiality / anonymity
- No coercion
- Minimal deceit
- Fully debrief
- Honour promises to provide respondents with research reports
- Be aware of potential sources of bias / conflicts of interest

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## Survey instructions

- Instructions help to ensure consistency i.e., standard conditions across different administrations
- Few will read them without prompting
- Explain how to do the survey in a user-friendly manner, possibly with examples

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## Order, flow, and structure

- Start gently; ease respondent in
- Group similar questions together
- Consider order effects:
  - Habituation (e.g., polarisation of responses, yea-saying, nay-saying)
  - Fatigue
  - Min. switching between response formats
- Consider counter-balanced orders

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## Background information

- Single section, usually at beginning or end of questionnaire
- Only include personal questions that are justified by the research question(s)

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## Ending the survey

- Space for comments?
- Indicate the end of the survey - say thanks!
- Instructions about how to return the survey or submit responses
- Provide debrief or referral information
- Repeat details about how to contact researchers, obtain results, make complaint etc.

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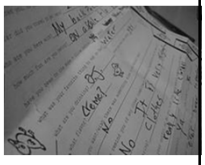
## Pre-testing a survey

- Pre-test items on conveniently sampled others – watch responses and ask for feedback
- Revise items e.g.,
  - which don't apply to everybody
  - are redundant
  - are misunderstood
  - are non-completed
- Reconsider ordering and layout



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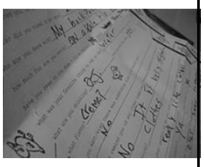
## Pilot testing a survey

- Pilot test on a small sample from the target population
- Analyse data
- Revise survey



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# Survey questions

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## Survey questions: Overview

1. Double-barrelled, double-negative, leading, and loaded questions
2. How to get the results you want
3. Survey question tips
4. Objective vs. subjective questions
5. Open- vs. closed-ended questions
6. Closed-ended response formats
7. Improving survey questions (Exercise)

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## Survey question tips

- **Direct**: Focus directly on topic/issue
- **Clear**: Use simple and clear language (avoid big words)
- **Brevity:** Keep questions as short as possible
- **Ask questions**: Phrase as questions

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## Survey question tips

- **Related tools**: Check/use similar surveys
- **Focus on objectives**: Only ask questions which relate to research objectives
- **Define target constructs**: Be as concrete and unambiguous as possible; the meaning must be clear to *all* respondents

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## Survey question tips

- **Applicability**: Questions must be applicable to all respondents (or use skip rules).
- **Exhaustive**: Response options must be exhaustive (i.e., provide options for suitable for each respondent) and mutually exclusive (i.e., not overlapping)
- **Demand**: Recall of detail must not be unnecessary or excessive

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## Double-barrelled questions

Questions which contain more than one concept or purpose should be simplified or split into separate questions:
e.g.,

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

vs.

"What should the speed limit be for cars?"

"What should the speed limit be for trucks?"

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## Double-negative questions

Negatively worded questions are often confusing because responding "no" creates a double negative. e.g.,

"Do you disapprove of gay marriage?" vs

"Do you approve of gay marriage?"

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## Leading questions

A question that suggests the answer the researcher is looking for is leading:
e.g.,

"Should psychologists earn more than they are currently paid?" vs.

"What do you think about psychologists' wages?"

"What dangers do you see with the new policy?" vs.

"What's are your opinions about the new policy?"

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## Using leading questions to get the results you want

## (Yes Minister clip)

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## Loaded questions

A question that suggests socially desirable answers or is emotionally charged is loaded:

e.g.,

"Have you stopped beating your wife?" vs

"Have you ever physically harmed your partner?"

"Do you advocate a lower speed limit in order to save human lives?" vs
"What speed limit is required for traffic safety?"

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## Objective questions

- A verifiably true answer exists (i.e., factual info).
- An observer (in theory) could provide an accurate answer.

How many times during the previous calendar year did you visit a general medical practitioner? _____

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## Subjective questions

- Asks about fuzzy personal perceptions
- There is no “true”, factual answer
- Many possible answers
- Can't be accurately answered by an observer.

Think about the visits you made to a GP during the previous calendar year. How well did you understand the medical advice you were given?

perfectly very well reasonably poorly not at all

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## Open-ended questions

- Rich information can be gathered
- Useful for descriptive, exploratory work
- Difficult and subjective to analyse
- Time consuming

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## Open-ended questions

What are the main issues you are currently facing in your life?

How many hours did you spend studying last week? _____

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## Closed-ended questions

- Important information may be lost forever
- Useful for hypothesis testing
- Easy and objective to analyse
- Time efficient

## Summary: Survey questions

1 Objective vs. subjective questions
   1 **Objective** – there is a verifiably true answer
   2 **Subjective** – based on perspective of respondent
2 Open vs. closed
   1 **Open** – empty space for answer
   2 **Closed** – pre-set response format options

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## Closed-ended response formats

1. Dichotomous and multichotomous
2. Multiple response
3. Ranking
4. Verbal frequency
5. Likert
6. Semantic differential
7. Graphical
8. Non-verbal

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## Dichotomous

Two response options e.g.,

Excluding this trip, have you visited Canberra in the previous five years? (tick one)

__ Yes __ No

Provides the simplest type of quantification (categorical LOM).

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## Multichotomous

Choose one of more than two possible answers e.g.,
What type of attractions in your current trip to Canberra most appeal to you? (tick the most appealing one)

__ historic buildings
__ museum/art galleries
__ parks and gardens

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## Multiple response

Provides a list of answers for respondents to choose from e.g.,
Tick any words or phrases that describe your perception of Canberra as a travel destination:

__ Exciting __ Important
__ Boring __ Enjoyable
__ Interesting __ Historical

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## Ranking

Measures the relative importance of several items
Rank the importance of these reasons for your current visit to Canberra (from 1 (most) to 4 (least)):

__ to visit friends and relatives
__ for business
__ for educational purposes
__ for holiday/ sightseeing

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## Verbal frequency

Over the last 12 months, how often have you argued with your intimate partner? (circle one)

1. All the time
2. Fairly often
3. Occasionally
4. Never
5. Doesn't apply to me at the moment

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## Likert

Measures strength of feeling or perception.
Indicate your degree of agreement with this statement:

"I am an adventurous person."

(circle the best response for you)

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |

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## Number of response options?

**Likert scale example**

AGREEMENT ABOUT SOMETHING

2-Categories

**DISAGREE**

**AGREE**

3-Categories

**DISAGREE** **NEUTRAL**

**AGREE**

4-Categories

**STRONGLY DISAGREE** **MILDLY DISAGREE** **MILDLY AGREE** **STRONGLY AGREE**

5-Categories

**STRONGLY** **MILDLY** **MILDLY** **STRONGLY**

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## Number of response options?

- How many response options?
  - Minimum = 2
  - Common = 3 to 9
  - Maximum = 10?
  - Basic guide: 7 +/- 2
- Scales should be sensitive (more categories) yet reliable (fewer categories).
- Watch out for too few or too many options.

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## Watch out for too few or too many options

"Capital punishment should be reintroduced for serious crimes"

1 = Agree 2 = Disagree

1 = Very, Very Strongly Agree
2 = Very Strongly Agree
3 = Strongly Agree
4 = Agree
V. Strongly Disagree
5 = Slightly Agree
Strongly Disagree
6 = Neutral
7 = Slightly Disagree
8 = Disagree
9 = Strongly Disagree
10 =
11 = V, V

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## Semantic differential

What is your view of **tobacco smoking**?
Place one tick on each row to show your opinion.

| | | |
|---|---|---|
| Bad | ___:___:___:___:___:___:___ | Good |
| Strong | ___:___:___:___:___:___:___ | Weak |
| Masculine | ___:___:___:___:___:___:___ | Feminine |
| Unattractive | ___:___:___:___:___:___:___ | Attractive |
| Passive | ___:___:___:___:___:___:___ | Active |

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## Graphical

Rate your enjoyment of the movie you just saw.
Mark your response with a cross (X) on the line below.

not very enjoyable — enjoyable

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## Non-verbal

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

Responses are converted into a number e.g., 1 to 5.

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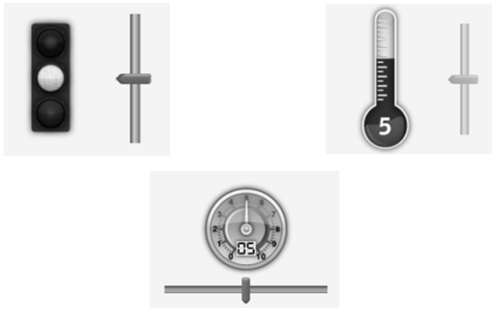
## Non-verbal



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## Summary: Response formats

1 Dichotomous and multichotomous
2 Multiple response
3 Verbal frequency scale (Never ... Often)
4 Ranking (in order → Ordinal)
5 Likert (equal distances → Interval, typically with 3 to 9 options)
6 Semantic differential (opposing words)
7 Graphical
8 Non-verbal

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# How could these questions be improved?

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## How could this question be improved?

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

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## How could this question be improved?

Are you satisfied with your marriage and your job?
(write your answer below)

_____
_

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## How could this question be improved?

You didn't think the food was very good, did you?
(tick your answer)
_____ Yes _____ No

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## How could this question be improved?

Environmental issues have become increasingly important in choosing hotels. Are environmental considerations an important factor when deciding on your choice of hotel accommodation?
(tick an answer)
____ Yes ____ No

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## How could this question be improved?

How did you hear about this restaurant?
(please circle appropriate responses)
____ yellow pages
____ Internet
____ word of mouth

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## Level of measurement = Type of data

Stevens (1946)

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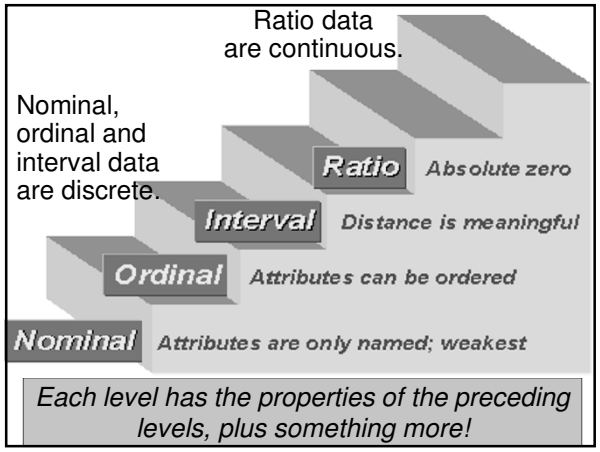


## Categorical / Nominal

- Conveys a category label
- (Arbitrary) assignment of #s to categories
  e.g. Gender

| Male | Female |
|---|---|
| 0 | 1 |
| 🚹 | 🚺 |

- *Numbers provide no useful information,* except as labels

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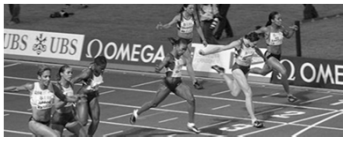
## Ordinal / ranked

- Conveys *order*, but not *distance*
  e.g. in a race, 1st, 2nd, 3rd, etc. or ranking of favourites or preferences

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## Interval

- Conveys *order* & *distance*
- 0 is arbitrary
- e.g., interval scale

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| STRONGLY DISAGREE | MILDLY DISAGREE | NEUTRAL | MILDLY AGREE | STRONGLY AGREE |

- For data analysis assumption testing, usually treat as continuous if > 5 intervals are used.

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## Ration

- Conveys *order* & *distance*
- Meaningful 0 point
  e.g. height, age, weight, time, number of times an event has occurred
- Continuous (i.e., there can be fractional amounts / decimal places)
- Ratio statements can be made
  e.g. X is twice as old (or high or heavy) as Y

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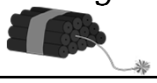
## Why does level of measurement matter?

Different analytical procedures are used for different levels of data.

*More powerful statistics can be applied to higher levels*



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## Summary: Level of measurement

**1 Categorical/Nominal**
- 1 Arbitrary numerical labels
- 2 Could be in any order

**2 Ordinal**
- 1 Ordered numerical labels
- 2 Intervals may not be equal

**3 Interval**
- 1 Ordered numerical labels
- 2 Equal intervals

**4 Ratio**
- 1 Meaningful 0
- 2 Data are continuous

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## Quiz question 1: What LOM is used?

Estimate **the average hours per week** (approx.) you spend during semester:

10. in paid employment ____
11. in classes (lectures, tutorials etc.) ____
12. studying outside of classes ____

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## Quiz question 2: What LOM is used?

How well do you think you have understood this lecture about survey design so far?

perfectly very well reasonably poorly not at all

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## Quiz question 3: What LOM is used?

Rate your view about this statement: Australia should provide residency for greater numbers of asylum seekers.

1 strongly disagree
2 disagree
3 neutral
4 agree
5 strongly agree

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## Quiz question 4: What LOM is used?

What is your favourite primary colour? (choose one of the following options)

- Red
- Yellow
- Blue

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# Sampling

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## Survey implementation issues

Consider survey research **implementation issues,** including:

1. Sampling methods
2. Sample size and return rates
3. Representativeness

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## Sampling: Overview

1. Sampling terms
2. What is sampling?
3. Why sample?
4. Sampling methods

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## Sampling terms

- **Target population**
  - To whom do you wish to generalise?
- **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?

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## What is sampling?

"Sampling is the process of selecting units (e.g., people, organizations) from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen."
- Trochim (2006)

## Why sample?

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

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## Sampling process

- Identify **target population** and **sampling frame**
- Select **sampling method**
- Calculate **sample size** for desired power.
- Maximise **return rate**

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## Representativeness of sample depends on:

- Adequacy of sampling frame
- Sampling method
- Adequacy of sample size
- Response rate – both the % & representativeness of people in sample who actually complete survey

It is better to have a small, representative sample than a large, unrepresentative sample.

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## Sampling methods

**Types of probability sampling:**
- Simple random
- Systematic random
- Stratified random

**Types of non-probability sampling:**
- Convenience
- Purposive
- Snowball

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## Probability sampling

- Each unit has an equal chance of selection
- Selection occurs entirely by random chance

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## Simple random sampling

- Everyone in the target population has an equal chance of selection
- Similar to a lottery:
  - Assign #s to list of names, then randomly select #s for the sample
  - Random selection can be manual, by using a table of random #s, or by computer

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## Systematic random sampling

- Respondents (units) are selected from a list e.g., list of students at regular intervals e.g., every 5th person (starting at a random number between 1 and 5)

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## Stratified random sampling

- Sub-divide population into strata (e.g., gender, age, or location)
- Randomly select from within each stratum
- Improves representativeness
- e.g., Telephone interviews conducted use using post-code strata

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## Non-probability sampling

- Useful for exploratory research and case study research
- Able to get large sample size quickly
- Limitations include potential selection bias and non-representativeness

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## Convenience sampling

- Sampling is by convenience (whoever is available) rather than random
  e.g. surveying visitors to a tourist attraction over one weekend
- Less cost/time involved than random sampling
- Subject to sampling bias

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## Purposive sampling

- Respondents are selected for a particular reason e.g., because they are "typical" respondents
- e.g., for a tourism study, select a sample of tourists aged 40-60 for interviews as this is the typical age group of visitors to Canberra
- e.g., Contacting Frequent Flyer members to participate in a survey about service quality in an airline setting

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## Snowball sampling

- Respondents are asked to recommend other respondents
- Useful for difficult to access populations e.g., illegal immigrants, illegal drug users
- e.g., in studying ecstasy users, a research may gain trust of a few potential respondents and ask then these respondents to recommend the researcher to other potential respondents

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## Summary: Sampling

1 Key terms
  1 (Target) population
  2 Sampling frame
  3 Sample
2 Sampling

| Probability (random) | Non-probability |
|---|---|
| 1 Simple | 1 Convenience |
| 2 Systematic | 2 Purposive |
| 3 Stratified | 3 Snowball |

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# Biases

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## Biases: Overview

Biases which can influence survey research data:

- **Sampling biases**
  - Sample does not represent target population
- **Non-sampling biases**
  - Measurement tool reliability and validity
  - Response biases

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## Response biases

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

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## Demand characteristics

Participants form an interpretation of the researcher's purpose and unconsciously change their behaviour to fit that interpretation.

**Interview**

- Higher demand characteristics

**Questionnaire**

- Lower demand characteristics

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## Maximising response rate

- Respondent's level of interest
- Rewards
- Accompanying letter / introduction
- Layout and design
- Colour of paper
- Mail surveys - self-addressed stamped return envelope
- Reminders or follow up calls

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## Summary: Non-sampling biases

1 Acquiescence
2 Order effects
3 Fatigue effects
4 Demand characteristics
5 Hawthorne effect
6 Self-serving bias
7 Social desirability

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## References


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## Next lecture

### Descriptives and graphing

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

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