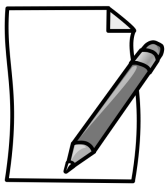
Survey Design



Lecture 2

Survey Research & Design in Psychology

James Neill, 2017

Overview

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

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

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

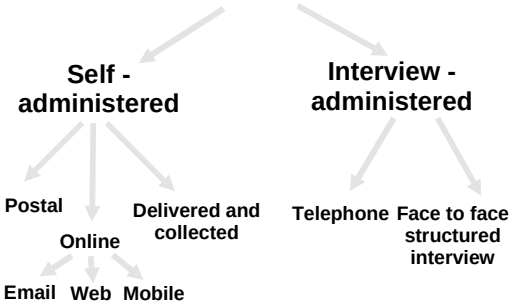
Survey administration methods

Survey administration methods

Consider the pros and cons of two common **survey administration methods:**

1. Interview-based
2. Self-report

Types of surveys



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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**

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Survey types

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

Examine the nuts & bolts of **questionnaire design** including:

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

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 questionnaire development

1. Formulate generic questionnaire

Create separate sections for each study objective.

2. Expand the questionnaire

Question order & funnel qs

Draft qs & response formats

3. Pre-test, pilot test, & redraft

4. Finalise questionnaire & implement

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Parts of a survey

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

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Layout

- Layout should be clear, simple, and 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
- Organise into a logical flow/order
- Number each question

Participant information

Summarise important details about the research project 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.

Informed consent

- **Active consent**: A page or screen which allows participants to indicate whether or not they consent to participate in the study
- **Passive content**: If you consent to participate, then please continue, otherwise hand the survey back or close the screen

Ethical considerations

- Informed consent
- Minimise risk / 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

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

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

Background information

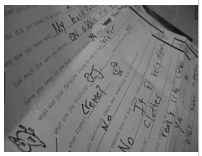
- Single section, usually at beginning or end of questionnaire
- Only include personal questions that are justified by the research question(s)

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.

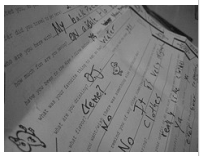
Pre-testing

- 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



Pilot-testing

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



Survey questions

Survey questions: Overview

1. How to get the results you want
2. Double-barrelled, double-negative, leading, and loaded questions
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)

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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Watch out for questions which are … double-barrelled

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

e.g.,

“What do you think the speed limit should be for cars and trucks?” vs.

“What do you think the speed limit should be for cars?”

“What do you think the speed limit should be for trucks?”

Watch out for questions which are … double negative

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?”

Watch out for questions which are … leading

A question that suggests the answer the researcher is looking for is leading:

e.g.,

“Do you agree that psychologists should earn more than they are currently paid?” vs.

“Do you think that psychologists' wages are lower than they should be, higher than they should be, or about right?”

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

“What do you think about the new policy?”

How to design a poll to get the results you want by using leading questions

(Yes Minister clip)

Watch out for questions which are … loaded

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?"

Objective questions

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

e.g.,

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

Subjective questions

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

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: Examples

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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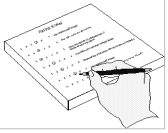
Closed-ended questions

- 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
2. Multichotomous
3. The list (multiple response)
4. Ranking
5. Verbal frequency scale
6. Likert scale
7. Graphical rating scale
8. Semantic differential
9. Non-verbal (idiographic)

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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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The list (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 scale

Over the last [period of time], 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 scale

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 DISAGREE	MILDLY DISAGREE	NEUTRAL	MILDLY AGREE	STRONGLY AGREE

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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 many or too few response 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
5 = Slightly Agree
6 = Neutral
7 = Slightly Disagree
8 = Disagree
9 = Strongly Disagree
10 = V. Strongly Disagree
11 = V, V Strongly Disagree

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Graphical rating scale

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

not enjoyable — very enjoyable

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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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Non-verbal (idiographic) scale

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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Summary: Response formats

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

How could these survey questions be improved?

Example: How could this question be improved?

How old are you in years?
(circle one response)

18-20

20-22

22-30

30 and over

Example: How could this question be improved?

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

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Example: 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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Example: 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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Example: 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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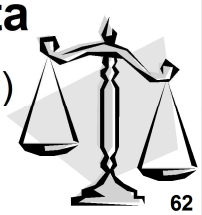
Levels of measurement = Type of data

Stevens (1946)



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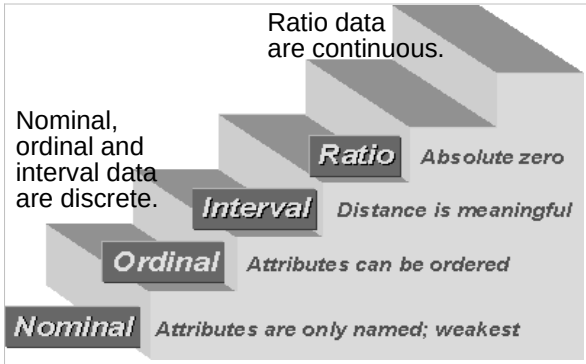
Ratio data are continuous.

Nominal, ordinal and interval data are discrete.



Each level has the properties of the preceding levels, plus something more!

Categorical / nominal

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

Male	Female
0	1
🚹	🚺

- *No useful information,* except as labels

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Ordinal / ranked scale

- 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 scale

- 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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Ratio scale

- 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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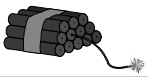
Why do levels of measurement matter?

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 level of measurement are the following questions?

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 level of measurement is used for this survey question?

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 level of measurement is used for this survey question?

Rate your view about this statement:

Australia should provide residency to more asylum seekers.

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

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Quiz question 4: What level of measurement is used for this survey question?

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

- Red
- Yellow
- Blue

Sampling

Survey implementation issues

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

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

Sampling: Overview

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

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?

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 a 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

Probability sampling

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

Simple random sampling

- Everyone in the target population has an equal chance of selection
- Useful if clear study area or population is identified
- Similar to a lottery:
  - List of names are assigned #s and then randomly #s are used to select respondents
  - Random selection can be manual using a table of random #s or by computer

Systematic random sampling

- Respondents (units) are selected from a list e.g., list of students
- Useful when target population closes matches a list
- Select the sample at regular intervals e.g., every 5th person on a list (starting at a random number between 1 and 5)

Stratified random sampling

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

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

Convenience sampling

- Sampling is by convenience (i.e., whoever is available) rather than randomly
  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)
     1. Simple
     2. Systematic
     3. Stratified
   2. Non-probability
      1. Convenience
      2. Purposive
      3. Snowball

Biases

Learning outcomes: Biases

Consider the potential for **bias** in survey research including:

1. Sampling biases
2. Non-sampling biases

Biases

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

Response biases

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

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

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

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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