

Survey Design



Lecture 2

Survey Research & Design in Psychology

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Overview



1. Lecture 1 summary
2. Research process
3. Survey types – Interview vs. self-administered
4. Survey construction
5. Levels of measurement
6. Biases
7. Sampling

2

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

3

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

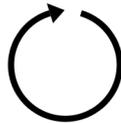
2. Cons

- 1. Low compliance
- 2. Reliance on self-report

4

Research process

Examples of iterative research process models and where survey design and sampling fits in.



5

Learning outcome: Research process

Understand recommended **research process** steps involved in survey research including **planning, developing, implementing, and reviewing** the project.

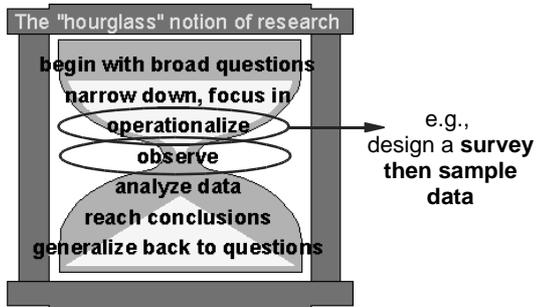
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A typical scientific survey research process

Reality / observation / theory →
Problem definition / hypotheses →
Research method design (incl. **survey**) →
Collect data →
Analyse → Results →
Discuss (generalise / apply) →
Disseminate (get reviewed / publish) →
New study?

7

“Hourglass” notion of research



Survey types

9

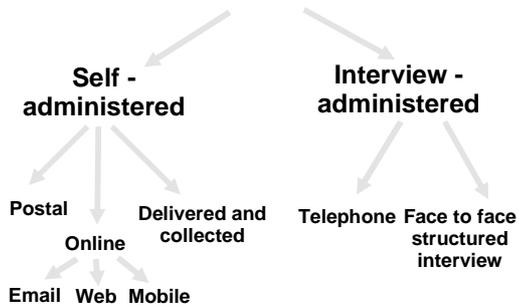
Learning outcome: Survey administration methods

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

1. Interview-based survey
2. Self-report survey

10

Types of surveys



11

Advantages and disadvantages of self- and interview-administered surveys

#	Aspects of survey administration	Type of survey	
		Self-administered survey	Interview (2f 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

12

Survey types

Self-administered

–Pros:

- Cost
- demand characteristics
- access to representative sample
- anonymity

–Cons:

- Non-response
- adjustment to cultural differences, special needs

Opposite for interview-administered surveys

Survey construction



Learning outcome: Questionnaire design

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. Parts of a survey
 2. Order, flow and structure
 3. Demographics and personal information
 4. Ending the survey
 5. Layout
 6. 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)

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

4. Finalise questionnaire & implement

3. Pre-test, pilot test, & redraft

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)

19

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 questions

20

Participant information sheet

Summarises 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?
- What are the risks/costs/rewards?
- How will results be used?
- Human ethics approval #
- More info: Complaints, how to obtain results, researcher contact details etc.

21

Informed consent form

A separate page or screen, following the Participant Information Sheet, which allows participants to indicate whether or not they consent to participation in the study:

- How is consent given / not given and recorded? (Can be active consent or passive consent)
- Statement should include that participants are free to not participate in any part of the study and to withdraw at any time

22

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

23

Survey instructions

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

24

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
 - Minimise switching between response formats
- Consider counter-balanced orders

25

Demographics and personal information

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

26

Ending the survey

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

27

Pre-testing

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



28

Pilot-testing

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



29

How to write good survey questions

30

How to write good 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)₃₁

How to design a poll to get the results you want



(Yes Minister clip)

32

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

33

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

34

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

35

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?”

36

**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?"

37

**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?"

38

**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?"

39

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? _____

40

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

41

Open-ended questions

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



42

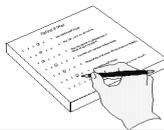
Open-ended questions: Examples

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

How many hours did you spend studying last week? _____

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

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)

46

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).

47

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

48

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

49

Ranking

Helps to measure 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

50

Verbal frequency scale

Over the past month, 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

51

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.

58

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)

59

How could these survey questions be improved?

60

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

61

Example: How could this question be improved?

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

62

Example: How could this question be improved?

You didn't think the food was very good, did you?
(tick your answer)

Yes No

63

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

64

Example: How could this question be improved?

How did you hear about this restaurant?

(please circle appropriate responses)

yellow pages

Internet

word of mouth

65

Levels of measurement

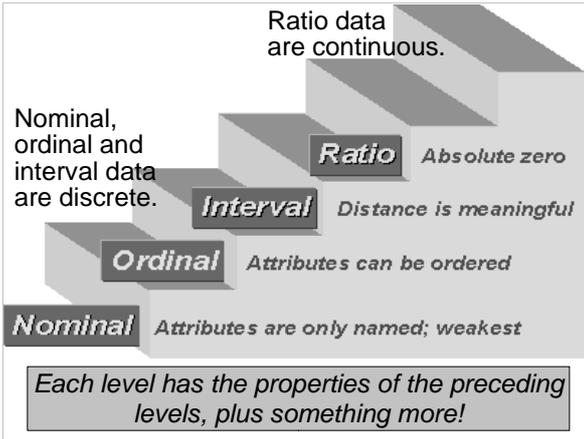
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Type of data

Stevens (1946)



66



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*

68

Ordinal / ranked scale

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



69

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.

70

Ratio scale



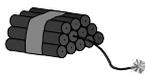
- Conveys *order & distance*
- Meaningful 0 point
e.g. height, age, weight, time, number of times an event has occurred
- Continuous (i.e., there can be fractional amounts / decimal places)
- Ratio statements can be made
e.g. X is twice as old (or high or heavy) as Y

71

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



72

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

73

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 _____

74

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

75

**Learning outcome:
Survey implementation issues**

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

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

79

**Sampling:
Overview**

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

80

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?

81

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.

83

Sampling process

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

84

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.

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

88

Systematic random sampling

- Respondents (units) are selected from a list e.g., list of students
- Useful when target population closely 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)

89

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 using post-code strata

90

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

91

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

92

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

93

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 researcher may gain trust of a few potential respondents and ask then these respondents to recommend the researcher to other potential respondents

94

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

95

Biases

96

**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

100

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

101

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

102

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103

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104
