Survey Design

Lecture 2

Survey Research & Design in Psychology
James Neill, 2015

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

2

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

3

Overview

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

4

Learning outcomes

Understanding of the learning outcomes for this lecture and associated readings should be demonstrated via the lab report assessment exercise.

5

Learning outcome 1: Research process

Understand recommended **research process** steps involved in survey research studies including **planning, developing and implementing** research questionnaires.

6

Learning outcome 2:
Survey administration methods

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

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

7

Learning outcome 3:
Questionnaire design

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

1. Question style (open/closed, objective/subjective)
2. Response formats
3. Levels of measurement
4. Layout
5. Pre- and pilot-testing

8

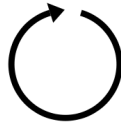## Learning outcome 4:
Survey implementation issues

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

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

9

Research process

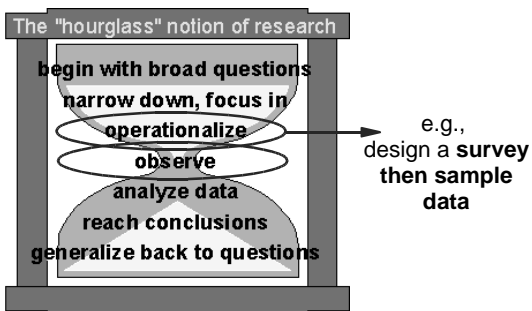Examples of iterative research process models and where survey design and sampling fits in.

A typical scientific survey research process

Reality / observation / theory →

Problem definition / hypotheses →

Research method design (incl. **survey**) →

Collect data →

Analyse →

Discuss (generalise / apply) →

Disseminate (get reviewed / publish) →

New study?

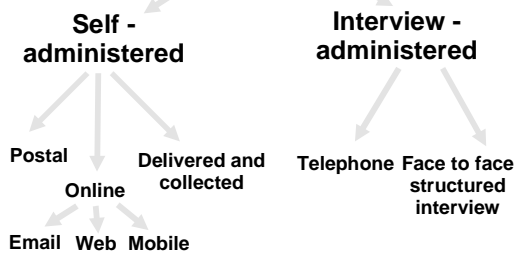## "Hourglass" notion of research

The "hourglass" notion of research

begin with broad questions

narrow down, focus in

operationalize

observe

analyze data

reach conclusions

generalize back to questions

e.g., design a **survey** then sample data

Survey types

Types of surveys

Self - administered

Interview - administered

Postal

Online

Delivered and collected

Telephone

Face to face structured interview

Email   **Web**   **Mobile**

Advantages and disadvantages of self- and interview- administered surveys

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

Put "low" or "high" in each cell and indicate for each row, which is more desirable.

#	Aspects of survey administration	Type of survey	
		Self-administered 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

Summary: Survey types

- Self-administered surveys:
  - **Pros**:
    - cost
    - demand characteristics
    - access to representative sample
    - anonymity
  - **Cons**:
    - non-response
    - adjustment to cultural differences, special needs
- Interview-administered surveys have the opposite pros and cons

Survey construction

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

Surveys are science and 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)

21

Questionnaire development

1. Formulate generic questionnaire	→	2. Expand the questionnaire
Turn into separate sections based on study objectives.		Question order & funnel qs Draft qs & response formats
4. Finalise questionnaire & implement	←	3. Pre-test, pilot test, & redraft

22

Parts of a survey

- Participant information sheet
- Informed consent form
- Survey with sections containing measurement items for each objective
- End page(s)
  - Indication of survey end
  - Instructions for returning survey

23

Parts of a survey

- Participant information sheet
- Informed consent form
- Survey with sections containing measurement items for each objective
- End page(s)
  - Indication of survey end
  - Instructions for returning survey

24

Layout

- Make it look clean and easy
  - Large size (14 pt) and clear font type
  - Minimise number of pages
  - Logical flow/order
  - High contrast e.g., avoid text in coloured boxes, etc.
  - Number the questions

25

Participant information sheet

Outline details of research project e.g.,:
- Who are you? Are you bona fide?
- Purpose of survey?
- What's involved?
- Explain any risks/costs/rewards
- How will results be used?
- Human ethics approval #
- More info: Complaints, how to obtain results, contact details etc.

26

Informed consent form

A separate page or screen following the participant information sheet which allows participants to indicate whether they consent or do not consent to participation in the study:
- How is consent given / not given? (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

27

Ethical considerations: How to treat respondents

- 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

28

Instructions

- Provides consistency - helps to ensure standard conditions across different administrations
- Few will read it without good prompting and easy-to-read instructions
- Explain how to do the survey in a user-friendly manner, possibly with examples

29

Order, flow and structure

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

30

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)

31

Ending the survey

- Space for comments?
- Indicate the end
- Say thanks!
- Provide instructions about how to return the survey or submit responses
- Details about how to contact researchers, obtain results, make complaint etc.
- Debriefing or referral information
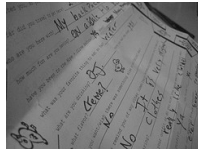
32

Pre-testing

- Pre-test items on convenient others - ask for feedback
- Revise items e.g.,
  - Which don't apply to everybody
  - Are redundant
  - Are misunderstood
  - Are non-completed
- Reconsider ordering & layout
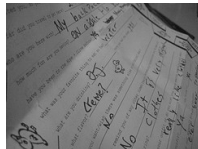
33

Pilot-testing

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

34

How to write good survey questions

35

How to write good survey questions: Overview

1. Survey question tips
2. Objective vs. subjective questions
3. Open- vs. closed-ended questions
4. Closed-ended response formats
5. Improving survey questions (Exercise)

36

Survey question tips

- **Be direct**: Focus directly on topic/issue
- **Be clear**: Brief and readable
  - Avoid big words
  - Use simple and correct grammar
- **Define target constructs**: be as concrete and unambiguous as possible; the meaning must be clear to *all* respondents

37

Survey question tips

- **Related tools**: Check similar surveys
- **Relate to objectives**: Only ask questions that relate to research objectives
- **Ask questions**: Phrase as questions
- **Brevity**: Keep questions as short as possible

38

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

39

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?"

40

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?"

41

Watch out for questions which are...

Leading: A question that suggests the answer the researcher is looking for 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?"

42

Watch out for questions which are...

Loaded: A questiopn that suggest socially desirable answers or is emotionally charged. e.g.,

"Have you stopped beating your wife?" vs
"Have you ever physically struck your partner?"

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

43

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 2014 did you visit a general medical practitioner? _____

44

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 2014. How well did you understand the medical advice you were given?

perfectly   very well   reasonably   poorly   not at all

45

Open-ended questions

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

46

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? _____

47

Closed-ended questions

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

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)

49

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).

50

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

51

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

52

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

53

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

54

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

55

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

56

Number of response options?

How many response options?
- Minimum = 2
- Average   = 3 to 9
- Maximum = 10?

Basic guide: 7 +/- 2

57

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

58

Sensitivity & reliability

- Scale should be sensitive yet reliable.
- Watch out for too few or too many options.

59

Graphical rating scale

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

not   very
enjoyable   enjoyable

60

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

61

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.

62

Summary: Survey questions

1. Objective vs. subjective questions
   - **1. Objective** – there is 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

63

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)

64

How could these survey questions be improved?

65

Example: How could this question be improved?

How old are you?

___ 18-20

___ 20-22

___ 22-30

___ 30 and over

66

Example: How could this question be improved?

Are you satisfied with your marriage and your job?

_____

67

Example: How could this question be improved?

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

_____ Yes _____ No

68

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

69

Example: How could this question be improved?

How did you hear about this restaurant?
(please tick appropriate spaces)
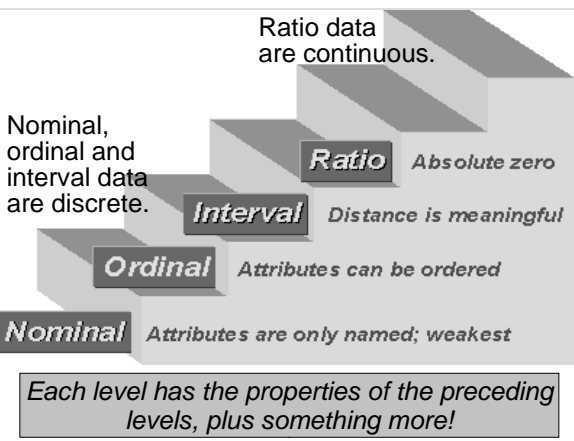_____ yellow pages
_____ Internet
_____ word of mouth

70

Levels of measurement = Type of data

Stevens (1946)

71

Ratio data are continuous.

Nominal, ordinal and interval data are discrete.

Ratio — Absolute zero

Interval — Distance is meaningful

Ordinal — Attributes can be ordered

Nominal — Attributes are only named; weakest

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

73

Ordinal / ranked scale

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

74

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.

75

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

76

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
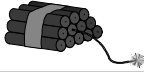
77

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

78

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 _____

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

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

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

82

Sampling

83

Sampling:
Overview

1. Sampling terms
2. What is sampling?
3. Why sample?
4. Sampling methods
5. Example: Shere Hite's survey

84

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?

85

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.

87

Sampling process

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

88

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.

89

Sampling methods

Types of probability sampling:

- Simple random
- Systematic random
- Stratified random

Types of non-probability sampling:

- Convenience
- Purposive
- Snowball

90

Probability sampling

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

91

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

92

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)

93

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

94

Non-probability sampling

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

95

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

96

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

97

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

98

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

99

Biases

100

Biases

Biases which can influence survey research data:

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

101

Response biases

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

102

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

103

Maximising response rate

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

104

References

- Alreck, P. & Settle, R. (1995). *The survey research handbook* (2nd ed.). New York: Irwin.
- Reeve, J. (2009). *Understanding motivation and emotion* (5th ed.). Hoboken, NJ: Wiley.
- Stevens, S.S. (1946). On the theory of scales of measurement. *Science*, *103*, 677-680.
- Trochim, W. M. K. (2006). . In *Research Methods Knowledge BaseSampling*.
- Wikipedia (2009). *Shere Hite - Methodology*.

105

Open Office Impress

- This presentation was made using Open Office Impress.
- Free and open source software.
  - http://www.openoffice.org/product/impress.html