

GUIDELINES TO DESIGNING A RELIABLE QUESTIONNAIRE

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Overview

- Research question
- Validity & reliability
- Types of questions
- What can go wrong with questions
- Modes of collection
- Making inferences

"If you want the answer—ask the question."

— Lorii Myers

Research Question:

A research question is needed **before** a questionnaire can be designed.
A research question outlines what is of interest and is usually informed by the literature.

Example:

"To investigate the prevalence of clinically relevant sleep disturbance in elite Irish multi-sport athletes and their associations with sleep hygiene practices, general health, mood, chronotype, and injury"¹

¹Biggins, M., Purtill, H., Fowler, P., Bender, A., Sullivan, K. O., Samuels, C., & Cahalan, R. (2019). Sleep in elite multi-sport athletes: Implications for athlete health and wellbeing. *Physical Therapy in Sport*, 39, 136-142.

Validity and reliability of data

Validity: Does the variable measure what it is supposed to?

Q. If customers returned 36 coats to Dunnes Stores and only 12 to Amy's Boutique next door, does this mean that Dunnes' customers were less satisfied?

Q. What would be a valid measure of depression.... chronic pain... loneliness...income... job satisfaction?

Q. Is BMI a valid measure of obesity?

Reliability: A measurement process is reliable if repeated measurements on the same unit give the same (or approximately the same) results.

Example: A reliable bathroom scales produces the same reading each time used, providing that sufficient time does not pass for the individual to gain or lose weight.

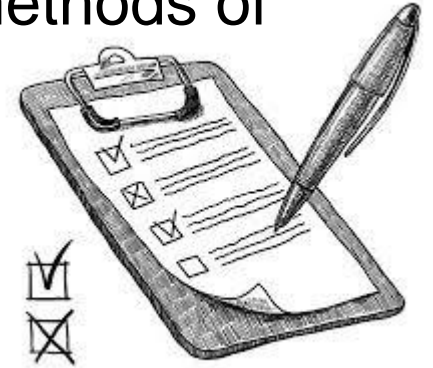
Inter-rater and **Intra-rater reliability** are important concepts to be aware of in questionnaire design.

If possible use a measure that has had **validity and reliability already demonstrated**.

E.g. Center for Epidemiologic Studies Depression Scale (CES-D)

Survey Research

Questionnaires are one of the most frequently used methods of data collection in research.



The **six stages of survey research** are:

- Identification of the research question
- Preparation of questionnaire (including a pilot survey)
- Sampling
- Data collection
- Analysis of data
- Make inferences about the population based on the analysis

Structure of the questionnaire

It is important to consider the structure of the questionnaire carefully.

- how many questions are needed?
- what type of questions do you need?
- the order of the questions.
- how to write the questions.

Question Types

1. Open questions

- Allow the respondent to give their opinion and can provide rich data.
- Difficult to code and time consuming to analyse.

Examples:

1. What do you like best about Ireland?

2. What effects do you feel social media marketing has had on your business?

2. Closed questions

- The respondent chooses their answer(s) from a list of options
- Straight forward methods of analysis
- List of options must be chosen carefully to ensure they are **unique** and **include all possible responses**

Examples of scaling/options for closed questions

- Yes/No
- List of categories (tick boxes)
- Likert Scaling (e.g. Strongly agree, Agree, Neither agree nor disagree, Disagree, Strongly disagree)
- Ranking
- Numeric (Eg: Numeric Rating Scale, Visual Analogue Scale)

Examples of closed questions

1. In general, how would you describe relations between managers and employees here? (*tick one box*)

- Very good
- Good
- Neither good nor poor
- Poor
- Very poor

2. Which of the following describes your current marital status? (*tick one box*)

Single

Widowed

Divorced/Separated

Living with spouse or partner

Notes:

1. It is very important to give **instructions** (e.g. tick one box, tick all that apply etc.)

2. Use “tick all that apply” questions with **caution**.

Known as **multiple response** questions, each choice will require a separate column in the dataset and it’s not possible to use a statistical test to compare these columns.

Question Wording – what to avoid...

- Leading ? Offensive ? Hypothetical ?
- Double Questions
- Questions that rely on knowledge of jargon, literacy levels or memory
- Vague Questions
- Imprecision
- Sensitivity

A good question will.... provide reliable and valid data.

Note: It is very important to keep the questionnaire as **short** as possible

What's wrong with these questions?

1. Do you eat out in restaurants every week? Yes No
2. How much did you spend on buying chocolate in the last 12 months?
3. If you were minister for the environment, how would you solve the housing crisis in Dublin?

4. The Shannon region has difficulty attracting new overseas visitors. Would you agree that the government should do more to promote the Shannon region? Yes No

5. Are you against drug abuse? Yes No

6. Where did you grow up? (Tick one box)

City

Farm

Country

7. Would you consider visiting Bunratty or the Cliffs of Moher?

Yes No

8. How would you rate cleanliness of this hotel? (Tick one box)

- Excellent
- Very Good
- Good
- Poor

A better scale to use...

Excellent

Very Good

Good

Fair

Poor

9. What is your age? (Tick one box)

- Less than 20 years
- 20 – 30
- 30 – 40
- 40 – 50
- Above 50 years

10. Is mathematics easy to understand? (Tick one box)

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Ethical issues include....

- Time required of the respondent & what the information will be used for.
- Confidentiality vs Anonymity vs Non-identifiability

Pilot studies

- Will it work?
- Checks sampling frame, questions, investigators training etc.
- Usually random sampling is not used – results not eligible for final study
- Estimate of non-response

Mode of Data Collection

Direct Methods:

- Observation
- Face-to-face interviews
- Telephone interviews

Indirect methods:

- Postal surveys, e-mail surveys
- Deposit the questionnaire to be collected later
- Diary cards collected periodically

NB: Layout of the questionnaire should be **very clear, easy to read & understand**

Post

- Cover letter outlining:
 - Who is asking for the information?
 - For what purpose?
 - Who will have access to it?
- Pre-paid addressed envelope
- Clear instructions
- Cost? Time? Response?

E-mail/Internet

- Cover letter as above with link to survey
- Cheap but can have very low response rate

NB: In the cover letter it is very important **not to say** what you are hoping to find out from the research.

Telephone

- All sample accessible by phone?
- Time? Money?

Interview

- Time, Place, Style
- “Response effect” - bias, subjectivity
- Adaptability
- Recording

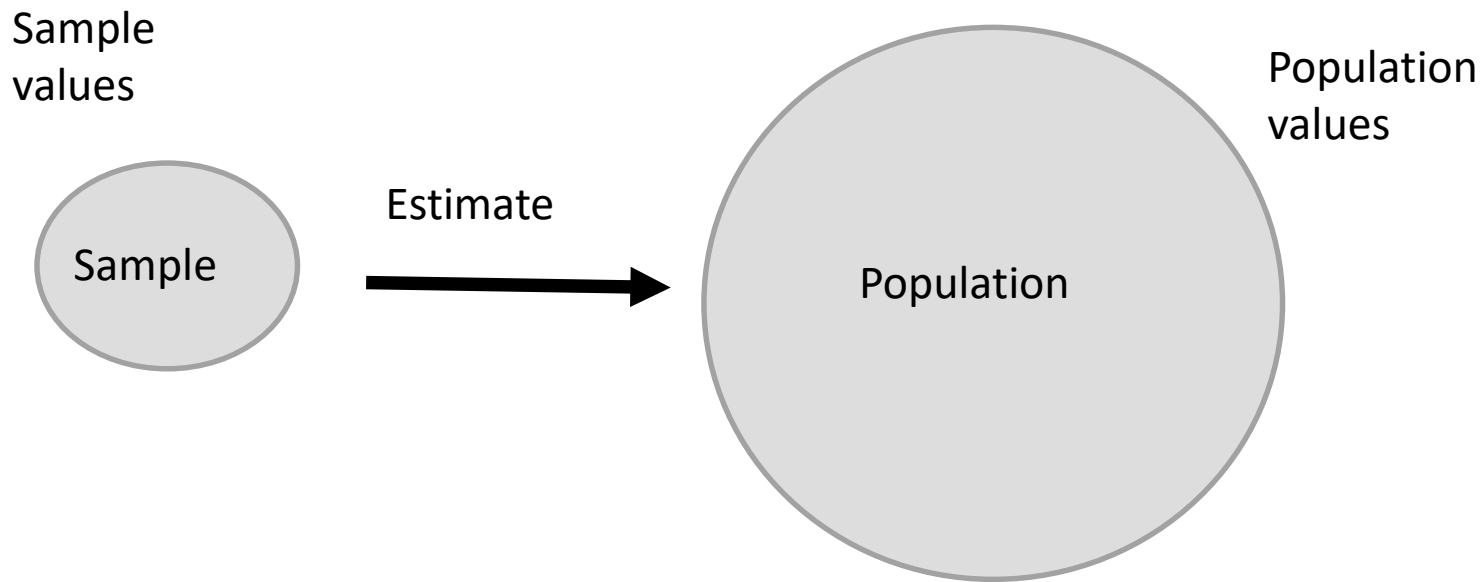
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Inferences about the population are made from the analysis of the sample...



But sometimes this doesn't work...

Example: The 1936 Literary Digest Poll

In 1936, Literary Digest polled a sample of **2.4 million** Americans before the Landon vs Roosevelt election.

The poll predicted the **republican party candidate Alf Landon to win by a 3 to 2 margin.**

But Franklin Roosevelt won easily!

Roosevelt vote

Predicted vote - 43%

Actual vote - 62%

What went wrong?



Literary Digest made **two crucial errors**:

1. The sample resulted from 10 million questionnaires sent out to be voluntarily returned (only 24% were returned).

High non-response

2. The list from which the sample was created using phone records, memberships of social clubs and motoring clubs.

Biased sample

Are these issues relevant to collecting data today?

- Email and Internet surveys – often have a response rate as low as 10%.
- How do we identify a non-biased sample?

Questions to Ask before believing the results of a survey:

- Who carried out the survey?
- What was the population?
- How was the sample selected?
- How large was the sample?
- What was the response rate?
- How were the subjects contacted?
- When was the survey conducted?
- What were the exact questions asked?

Thank you...