Designing questionnaires for scholarship

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INSPIRING PEOPLE

Overview

- Why questionnaires?
- Design phases
- Design considerations
- Task: Review an example
- Data analysis & reporting
- Optional Task: Share draft survey, give feedback

Why questionnaires?

	Survey	Focus group/interview
Purpose?	Generalisations, trends	Insight into individual experiences
Research questions?	<u>What</u>, when, how many	<u>Why</u>, how,
Approach	Typically quantitative, may be (partly) qualitative	Exclusively qualitative
Sample/population size?	Large	Small (<50)

Design phases

- Evidence-based design
  - Engagement with relevant L&T studies, prior studies in area of interest
  - Good survey design guidelines
- Ethics permission
- Pre-pilot phase & refinements
- Pilot-phase (including analysis) & refinements
- Implementation
- Analysis
  - Summary statistics
  - Quantitative
  - Qualitative
- Reporting

A well-designed questionnaire for large scale dissemination can take up to 6 months to design!

Ethics

- <u>Always</u> seek ethics permission <u>BEFORE</u> gathering data!

- You will need:

  - Information sheet or Plain Language Statement (PLS) <u>AND</u>

  - EITHER Consent form, making reference to the General Data Protection Act
    OR explicit instructions in survey intro that completing survey implies consent <u>AND</u>

  - Privacy notice for GDPR processing

- Guidance:

  - <u>www.bera.ac.uk/researchers-resources/resources-for-researchers</u>

Ethics – college specific guidance

- Arts
  https://www.gla.ac.uk/colleges/arts/research/ethics/ethicsapplicationprocedures/

- MVLS:
  https://www.gla.ac.uk/colleges/mvls/governance/

- Social sciences:
  https://www.gla.ac.uk/colleges/socialsciences/students/ethics/

- Science and Engineering:
  https://www.gla.ac.uk/colleges/scienceengineering/staff/committees/ethicscommittee/

- However, best to log straight into **MyGlasgow –> Business Systems –> Research Ethics system** and download guidance and templates from there.
- If in any doubt, contact college ethics officers with your questions.

Design considerations

- Underpinning research question(s)

- A one-off or pre-post or longitudinal survey?

- Question types

- Question wording

- Order and grouping of questions

- How will you analyse the data?

Question types

Type	Examples	Data
Dichotomous	Yes/No	Categorical/nominal
Multiple choice (single or multiple answers)	Gender School Which of the following (select all that apply)…?	Categorical/ nominal
Likert scale	Strongly disagree - Strongly agree Not at all useful - Extremely useful Very poor - Very good Not at all confident - Extremely confident	Ordinal
Ranking	Rank the following (most to least important)	Ordinal
Numerical	Age Number of hours CPD in last year	Continuous/ scale
Open-ended	What did you like best about …?	Qualitative

Question wording

- Simple language
- Short questions
- Avoid:
  - Double-barrelled
  - Complex questions
  - Leading questions
  - Negative questions (statements including the word 'not')
  - Ambiguity
  - Irritating questions or instructions
  - Too many open-ended questions
- Don't assume prior knowledge
  - Robson (2002, citing de Vaus 1991) and Cohen et al (2000)

Order and grouping of questions

- Demographics typically at start or end

- Group related questions under themes
  - Cognitively easier for respondents to interpret and respond
  - e.g. see vet CPD example questionnaire

- Use branching so respondents don't have to skip past irrelevant questions

- If using inventory questions, mix related items within that section
  - May wish to reverse direction of questions to check reliability, but avoid *not* questions e.g. "I never/occasionally/often/always NOT do something"

When designing a survey...

Think about …

      Purpose of survey

      Research questions

      Are you looking for descriptions, correlations, differences, trends, predictions, or insights into experiences/views?

Possible research questions:

- How do students rate the use of technology-enhanced learning in my course?
- To what extent do students feel that my school listens to the 'student voice'?
- What are students' experiences of assessment and feedback in my college?

Task: Let's review a survey…

Veterinary CPD survey

Think about…

- Question types – are these appropriate?

- Question wording – is it clear?

- Order and grouping – is it well organised? Does it 'flow'?

- Length – is it too short or too long? About right?

- Any other comments?

Online survey platforms

Commercial tool e.g. SurveyMonkey

- Commonly used for social research
- But can be expensive for non-freemium features. Sharing an account with others has ethical implications
- **Not GDPR compliant so shouldn't be used**

Moodle Feedback

- Easily accessible in Moodle
- **But all teachers in course can see data (ethics)**

Online Surveys (formerly BOS)

- Free to use
- Allows export of data to Excel and SPSS
- Can give access to co-researchers
- **Best option for scholarship research**

Online Surveys

Email ris-research-surveys@glasgow.ac.uk with details of your proposed survey(s) and confirmation of ethical approval.

Or visit: https://www.gla.ac.uk/research/strategy/ourpolicies/useofonlinesurveystoolforresearch/

How to boost response rates

Online

- Consider timing of release to avoid survey fatigue or busy times
- Clear introduction/ purpose and instructions
- Personalised invitation
- Plain language statement/consent with reassurance of confidentiality or anonymity, and privacy notice
- Clearly organised & signposted
- Clear language (piloting can help with this)
- Keep questionnaire short
- Can set up system to send regular reminders to non-respondents
- Mobile-friendly

Number crunching...

Don't worry about remembering the details ... this is simply a reference guide

Explore and visualise the data

To gain insights into the data:

Frequency tables

Look at measures of central tendency & distribution

Bar charts (e.g. use clustered bar charts to compare different groups)

Parametric vs. non-parametric stats

Design	Parametric	Non-parametric
Central tendency	Mean	Median, mode
Dispersion/variance	Standard deviation, variance	Range, inter-quartile range
2 independent samples	Chi-square (nominal) t-test (independent samples, scale)	Chi-square (nominal) Mann-Whitney U (ordinal)
2 related samples	t-test (related samples)	Wilcoxon signed ranks test
K independent samples	ANOVA	Kruskal-Wallis ANOVA
K related samples	Repeated measures ANOVA	Friedman's two-way ANOVA
Correlation	Pearsons	Spearman's Rho

Non-parametric stats

Measures of central tendency and dispersion:

Average: Median or mode

Range: Minimum-Maximum and/or inter-quartile range

Between-group comparisons

2 related samples (e.g. pre- and post-test)

Wilcoxon-signed ranks test

2 independent samples (e.g. control vs. test group)

Mann-Whitney U test

k related samples (e.g. Pre-test and immediate post-test and post-test one month later)

Friedman two-way ANOVA by ranks

k independent samples (e.g. UK vs. Europe vs. other students or 1st vs. 2nd vs. 3rd year students)

Kruskal-Wallis ANOVA

Measures of association

e.g. Scores on learning approach inventory (deep/surface) with performance or ratings of usefulness of educational intervention

Spearman's rho

See chapter on non-parametric stats in Pallant, J. (2016). SPSS survival manual: a step by step guide to data analysis using IBM SPSS, 6th edn, Open University Press, Maidenhead.

Level of measurement	One-sample case	2 related samples	2 independent samples	K related samples	K independent samples	Measures of association
Nominal or categorical (e.g. Yes/No)	Binomial test Chi-square goodness-of-fit	McNemar change test	Fisher exact test for 2×2 tables **Chi-square test for $r\times2$ variables**	Cochran Q test	**Chi-square test for $r\times k$ tables**	Cramer coefficient Phi coefficient for 2×2 tables The Kappa coefficient of agreement Asymmetrical association, the lambda statistic
Ordinal (e.g. 1-5 Likert scale)	Kolmogorov-Smirnov one-sample test One-sample runs test Change-point test	Sign test **Wilcoxon signed ranks test**	**Wilcoxon-Mann-Whitney test** Robust rank-order test Kolmogorov-Smirnov two-sample test Siegel-Tukey test for scale differences	**Friedman two-way analysis of variance by ranks** Page test for ordered alternatives	Extension of the median test **Kruskal-Wallis analysis of variance** Jonckheere test for ordered alternatives	**Spearman rank-order correlation coefficient** Kendal rank-order correlation coefficient Kendall partial rank-order correlation coefficient Kendall coefficient of concordance
Interval/scale i.e. continuous variables)		Permutation test for paired replicates				Correlation between k judges and a criterion Gamma statistic Somer's index of asymmetric association

Siegel, S. and N. J. Castellan (1988). Nonparametric Statistics for the Behavioural Sciences. New York, Mcgraw-Hill Book Company.

Levels of significance

Alpha level	Indicated by ...	Interpretation
<0.05	*	Less than a 1/20 probability that the result is due to chance
<0.01	**	Less than 1/100 probability that the result is due to chance
<0.001	***	Less than 1/1000 probability that the result is due to chance

No such thing as p=0.000
Results reported in this way by e.g. SPSS should be recorded as p<0.001

Reporting your quantitative findings

Prose, charts or tables – no need to report your findings in multiple formats, especially in papers

Which data do you need to report to answer the research question?

Examples of same study presenting different information for different audiences:

Dale, V., S. Pierce and S. May (2013). "Motivating factors and perceived barriers to participating in continuing professional development: a national survey of veterinary surgeons." Veterinary Record **173**(10): 1-7.

Dale, V. H. M., S. E. Pierce and S. A. May (2010). "The importance of cultivating a preference for complexity in veterinarians for effective lifelong learning." Journal of Veterinary Medical Education **37**(2): 165-171.

Qualitative analysis

Approach used will be informed by methodology.

Some useful generic references:

Braun, V. and V. Clarke (2006). "Using thematic analysis in psychology." Qualitative Research in Psychology **3**: 77-101.

Thomas, D. R. (2006). "A general inductive approach for analyzing qualitative evaluation data." American Journal of Evaluation **27**(2): 237-246.

Optional task: Your survey

Share a draft survey, give constructive peer feedback

- What changes would you make to your questionnaire design as a result?

References & further reading
(*check for later editions of research methods texts)

Artino, A. R., J. S. La Rochelle, K. J. Dezee and H. Gehlbach (2014). "Developing questionnaires for educational research: AMEE Guide No. 87." Medical Teacher 36(6): 463-474.

Boynton, P. M. and T. Greenhalgh (2004). "Selecting, designing, and developing your questionnaire." BMJ 328(7451): 1312-1315.

*Cohen, L., L. Manion and K. Morrison (2000). Questionnaires. Research Methods in Education. London and New York, Routledge Falmer: 245-266.

Magee, C., G. Rickards, L. A. Byars and A. R. Artino (2013). "Tracing the Steps of Survey Design: A Graduate Medical Education Research Example." Journal of Graduate Medical Education 5(1): 1-5.

*Oppenheim, A. N. (1992). Questionnaire Design, Interviewing and Attitude Measurement. London & New York, Continuum.

*Robson, C. (2002). Surveys and questionnaires. Real World Research. Padstow, Blackwell: 227-268.

*Siegel, S. and N. J. Castellan (1988). Nonparametric Statistics for the Behavioural Sciences. New York, Mcgraw-Hill Book Company.

Qualitative analysis (for open-text responses):

Braun, V. and V. Clarke (2006). "Using thematic analysis in psychology." Qualitative research in psychology 3(2): 77-101.

Thomas, D. R. (2006). "A general inductive approach for analyzing qualitative evaluation data." American Journal of Evaluation **27(2): 237-246.**