Assessing Research Protocols: Survey Research

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Overview of Survey Research

Survey research involves the collection of information from a sample of individuals through their responses to questions.

Surveys are efficient in that many variables can be measured without substantially increasing the time or cost. Survey data can also be collected from many people at relatively low cost and, depending on the survey design, relatively quickly. Survey methods lend themselves to probability sampling from large populations. Thus, survey research is very appealing when *sample generalizability* is a central research goal. In fact, survey research is often the only means available for developing a representative picture of the attitudes and characteristics of a large population. Surveys also are the method of choice when cross-population generalizability is a key concern because they allow a range of contexts and subgroups to be sampled. The consistency of relationships can then be examined across the various subgroups.

Survey research may be experimental or non-experimental and cross-sectional or longitudinal in nature. Surveys are most often used in non-experimental designs, but can also be used in experimental and quasi-experimental designs which involve the use of control groups and randomization. Cross-sectional surveys are administered at one point in time, whereas longitudinal surveys are administered at two or more points in time.

Survey Administration Options: Pros & Cons

Method of delivery	Pros	Cons	Practical notes
By post Participants are sent a copy of the questionnaire by post and asked to complete it and return it to the researcher.	Quick and easy to distribute. Relatively inexpensive.	They are not useful for the study of very personal issues and have a low response rate since you are relying on the goodwill and co-operation of individuals.	Enclose a detailed introductory letter, a complete contact address, and a stamped addressed envelope. You may need to send reminder letters and questionnaires to slow/non-responders.
By telephone The researcher calls participants and completes the questionnaire over the phone, with the	Quick and easy to complete. Relatively inexpensive.	Due to ethical constraints and sample bias these are used less within health research. You cannot control for participant refusal, which is often high.	Contact participants by letter in advance of your call – and offer them a chance to opt-out of your study (and avoid your phone call). Many ethics committees won't permit a study where

researcher reading out the questions and recording the answers.		Not suitable for those with hearing problems. Can become laborious if calling someone who is lonely and wants to talk.	cold calling is the main design.
By email Questionnaires are sent to participants via email for completion.	Easy to design and send out. Can keep track of who has responded and who hasn't, and send reminders.	Only suitable for participants with email access, and who can download a questionnaire. Can lead to confusion, where participants print out questionnaire and answer it by hand, rather than on the computer.	See telephone interview above. Participants need an introductory email announcing the research and an opt-out option. Follow data protection legislation, and check sending emails don't breach confidentiality.
By a website The questionnaire is placed within a website and participants are directed to this and invited to complete it.	A simple questionnaire can be easily designed and placed within a website. Since sites offer more space, it's possible to have more opportunities for qualitative feedback using this measure.	Participants are only those with access to the Internet. You may find they are a non-representative sample since they'll have a special interest for visiting your site. It is difficult to stop the same person answering the questionnaire a number of times over.	Check your site regularly to ensure you can access the questionnaire and that there aren't any 'bugs' in it. Encourage participants to report problems with accessing the questionnaire online.
Participant completion with researcher present The researcher can answer questions the participants may have, but the participant answers the questions.	The researcher is on-hand to offer support and explain any questions participants might not understand. They can also be sure that questionnaires are completed and collected.	Participants can inadvertently be 'led' by asking the researcher for advice on how to answer the questions.	Ensure your staff have training and support in how to deliver and code questionnaires and manage participants.
Researcher	The researcher	The researcher may	As above.

Administered (interview) The researcher asks the question and fills in the appropriate answers as directed by the participant.	can be certain the questionnaires are fully and accurately completed, and collected.	'lead' participants by their tone of voice or phrasing of questions. Participants may not understand what is required of them and not answer in a 'standardised way'.	If you are using standardised measures researchers have to read these out in exactly the same order as they appear written in the questionnaire.

Reducing Measurement Error, Sampling Error & Response Error in Survey Research

Survey measures: Are the measures valid and reliable?

- Valid measures are those that accurately reflect the concept they are designed to measure. An invalid measure will result in systematic measurement error. Validity is determined by examining:
    - *Face and content validity* Experts agree that the content of the instrument covers all dimensions of the construct under study
    - *Construct validity* Two measures that theoretically should be related are, in fact, related, or two measure that theoretically should not be related are, in fact, not related
    - *Criterion validity* The results based on use of the instrument are similar to some external standard or criteria
- Reliable measures are those that are stable and produce consistent results when nothing has changed in what is being measured. An unreliable measure will result in random measurement error. Reliability is most often determined by examining:
    - *Test-retest reliability* The degree to which survey scores are consistent from one test administration to the next with the same group of individuals (use correlation coefficient).
    - *Internal consistency reliability* The degree to which different survey items that probe the same concept produce similar results (must be reported for the survey as a whole OR for each scale within a survey using Cronbach's Alpha)

- Because concepts are multidimensional, we often have to operationalize them with several survey items using *scales and indices*. These forms of summation enable us to tap complexity, reduce random error, and increase precision in measurement.
    - Scales and indices are formed based on the results of internal consistency reliability testing and factor analysis to determine which survey items "hang together" or measure the same underlying characteristic.

Question wording: Does the question have a consistent meaning to respondents? Problems can occur with:

- *Lengthy wording* Words are unnecessarily long and complicated
- *Length of question* Question is unnecessarily long
- *Lack of specificity* Question does not specify the desired information
- *Lack of frame of reference* Question does not specify what reference comparisons should be made to
- *Vague language* Words and phrases can have different meanings to respondents
- *Double negatives* Question uses two or more negative phrases
- *Double barreled* Question actually asks two or more questions
- *Using jargon and initials* Phrasing uses professional or academic discipline-specific terms
- *Leading questions* Question uses phrasing meant to bias the response
- *Cultural differences in meaning* Phrases or words can have different meanings to different population subgroups

Respondent characteristics: Characteristics of respondents may produce inaccurate answers. These include:

- *Memory recall* Problems remembering events or details about events
- *Telescoping* Remembering events as happening more recently than when they really occurred
- *Agreement bias* Tendency for respondents to agree
- *Social desirability* Tendency to want to appear in a positive light and therefore providing the desirable response
- *Floaters* Respondents who choose a substantive answer when they really do not know
- *Fence-sitters* People who see themselves as neutral so as not to give the wrong answer
- *Sensitive questions* Questions deemed too personal

Format of questions: The structure of questions and the survey instrument may produce errors. Challenges include:

- *Open-ended questions* Response categories are not provided, left to respondent to provide

- *Closed-ended questions* Limited number of response categories are provided
- *Agree – disagree* Tendency to agree when only two choices are offered
- *Question order* The context or order of questions can affect subsequent responses as respondents try to remain consistent
- *Response set* Tendency to give the same response to a series of questions

Interviewer: The use of an interviewer may produce error.

- Mismatch of interviewer-interviewee demographic characteristics
- Unconscious judgmental actions to responses

Sampling: The margin of error (or confidence interval) is directly related to the size of the sample.

- Ideal sample sizes can be calculated based on how accurate you want the results to be (confidence level) and how much variation exists in the population; the latter can be determined through a pilot test, based on previous results, or through estimation.
- A larger sample and a greater response rate help to reduce the margin of error and increase the likelihood that the results are representative of the population.
- Missing data can be dealt with in the following ways:
  - Drop the participant's responses from the analysis
  - Substitute an average value for the missing data based on other responses
  - Replace the missing data with a random value
  - Insert the average score from the sample

Data collection strategy: The Dillman Method is widely used to help increase survey response rates and consists of the following steps:

- A brief pre-notice letter sent a few days prior to the survey
- The survey with a cover letter
- A replacement survey to non-respondents 2-4 weeks after original survey
- A final contact 2-4 weeks after previous mailing

Analysis Options

Type of response required from participant on the questionnaire	**You can analyze this data using…**
Binary or yes/no answers	c^2 (chi squared), Spearmans, Wilcoxon, Mann Whitney, Kruskal Wallis etc.
Rating or visual scales	Pearsons, t test, analysis of variance (ANOVA) etc.
Open-ended (free text) replies	Thematic content or discourse analysis

Survey Method Checklist

Design & Rationale

- Are the purpose and reasons for choosing a survey design mentioned?
- Is the nature of the survey identified?
    - Will the survey be cross-sectional (used at one point in time) or longitudinal (used over time)?
    - Will the data be collected by telephone, mail (post), online or email, in-person or a hybrid of the above methods?
    - Will the survey be anonymous or confidential? (Confidential allows for linking to external data sources which may prove beneficial.)
- What are the variables in the study? How do the variables cross-reference with the research questions and the items in the survey?

Population & Sample

- Are the population and its size (if known) mentioned?
- How many people will be in the sample? On what basis was this size chosen?
- What will be the procedure for sampling these individuals (e.g., random or nonrandom/convenience)?
- Will the population be stratified prior to sampling to ensure that specific characteristics are adequately represented in the sample? If so, how?

Instrument & Data Collection

- What instrument will be used in the survey? Who developed the instrument?
    - If using an existing instrument, are the validity and reliability scores from past use of the instrument mentioned?
    - If modifying or combining instruments or developing a new instrument, are plans for (re-)establishing validity and reliability mentioned?
- What are the content areas addressed in the survey? The scales? The length?
- What procedure will be used (or has been used) to pre-test and/or pilot test the survey?
- What is the timeline for administering the survey? What steps are being taken to ensure a high response rate?

Data Analysis

- Who will enter the survey data into a computer (if necessary)? Who will verify the entered data?
- What is the goal of the analysis and reporting the data?
    - Descriptive averages and frequencies for the survey as a whole? and/or
    - Comparisons intended to explain, predict or explore differences between populations of interest?
- What specific steps will be taken in data analysis to:

    - Conduct a descriptive analysis? (e.g., mean, standard deviation, and range)
    - Collapse items into scales? (if applicable) (e.g, factor analysis and reliability check for internal consistency)
    - Run inferential statistics to answer the research questions? (e.g., t-test, chi-square, etc.)
- How will the results be interpreted?

Resources Used to Develop this Handout

Boynton, P. (2004). Administering, analyzing, and reporting your questionnaire. *BMJ*, 328(7452): 1372-1375.

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