

Chapter 1

The Cornerstones of Survey Research

Edith D. de Leeuw

Joop J. Hox

Department of Methodology & Statistics, Utrecht University

Don A. Dillman

Washington State University

The goal of this chapter is to introduce the readers to the central issues in survey quality, to discuss the decisions that must be made when designing and implementing a survey, and to review the current methodological and statistical knowledge as presented in the *Handbook*.

Principles important for designing good quality surveys are discussed in terms of the four cornerstones of survey research: coverage, sampling, response, and measurement. These four cornerstones are connected via the specification of the research problem. Specification is concerned with conceptualisation and operationalization, where the research question is translated into survey questions for specific populations and ultimately into observed variables. Coverage and sampling refer to statistical issues that arise because we survey a sample instead of the entire population. Coverage errors occur when the sampling frame does not exactly matches the intended population. Sampling errors occur because we observe only a sample and not the population. If the sample is a probability sample, statistical theory can estimate the amount of sampling error. Response errors, usually designated as nonresponse errors, occur when some of the intended respondents cannot be reached or refuse to respond. If the nonrespondents are not a random sample from all intended respondents, nonresponse can result in biased estimates. Finally, measurement errors refer to discrepancies between the observed measurement and the true value due to the measurement instrument. Measurement errors can originate from many sources, including the interviewer, the respondents, and the specific survey questions.

Quality survey design tries to minimize all relevant sources of error within realistic constraints of time and budget. This chapter discusses the cornerstones in detail and relates them to specific chapters in the *International Handbook of Survey Methodology*. The *Handbook* is divided into sections, which are described briefly below.

The first section of the book, *Foundations*, provides a broad introduction in survey methodology. In addition to the chapter on cornerstones of survey research, it contains chapters on the psychology of asking questions, the problem of nonresponse, issues and challenges in international surveys, and ethical issues in surveys.

The second section, *Design*, presents a number of issues that are vital in designing a quality survey. It includes chapters on coverage and sampling, choosing the method of data collection, writing effective questions, constructing the questionnaire, and testing survey questions.

The third major section, *Implementation*, discusses the procedures to carry out a survey. There are chapters on face-to-face interviews, telephone interviews, self-administered questionnaires, Internet surveys and Interactive Voice Response. Finally, there is a chapter on the challenges that result when different data collection modes are mixed within a survey.

The fourth section, *Data analysis*, addresses statistical subjects that are especially important for analyzing survey data. These include chapters on constructing adjustment weights, analyzing data from complex survey designs, coping with incomplete data (item nonresponse), and accommodating measurement errors.

The final section, *Special issues*, contains a number of special interest topics for quality surveys. It includes chapters on survey documentation, quality assurance and quality control, interviewer training, collecting data on sensitive topics, and panel surveys including access panels. The final chapter introduces collecting survey-type data without asking questions of respondents, but by combining and integrating existing information.

GLOSSARY OF KEY CONCEPTS

Construct validity. The extent to which a measurement instrument measures the intended construct and produces an observation distinct from that produced by a measure of a different construct.

Coverage error. Coverage errors occur when the operational definition of the population includes an omission, duplication, or wrongful inclusion of an element in the population. Omissions lead to undercoverage, and duplications and wrongful inclusions lead to overcoverage.

Measurement error. The extent to which there are discrepancies between a measurement and the true value, that the measurement instrument is designed to measure. Measurement error refers to both variance and bias, where variance is random variation of a measurement and bias is systematic error. There are a number of potential sources; for example, measurement error can arise from the respondent, questionnaire, mode of data collection, interviewer, and interactions between these.

Nonresponse error. Nonresponse is the failure to collect information from sampled respondents. There are two types of nonresponse: unit nonresponse and item nonresponse. Unit nonresponse occurs when the survey fails to obtain any data from a unit in the selected sample. Item nonresponse (incomplete data) occurs when the unit participates but data on particular items are missing. Nonresponse leads to nonresponse error if the respondents differ from the nonrespondents on the variables of interest.

Sampling error. Error in estimation, due to taking a sample instead of measuring every unit in the sampling frame. If probability sampling is used then the amount of sampling error can be estimated from the sample.

Specification error. Specification error occurs when the concept measured by a survey question, and the concept that should be measured with that question, differ. When this occurs, there is low construct validity.