

Book Review

Gina K. Walejko¹

Frauke Kreuter. *Improving Surveys with Paradata: Analytic Uses of Process Information*. 2014
New York: Wiley, ISBN 978-0-470-90541-8, 416 pp, \$74.95.

Since Mick Couper coined the term “paradata” in a presentation given at the 1998 Joint Statistical Meeting, the collection and use of paradata have expanded steadily. In this evolving environment, the edited book *Improving Surveys with Paradata: Analytic Uses of Process Information* insightfully contributes to the growing discussion on the advantages and challenges of using paradata.

Although the definition of paradata varies with each chapter’s author, the book’s editor, Frauke Kreuter, takes an inclusive view, defining paradata as “additional data that can be captured during the process of producing a survey statistic.” (p. 3) Illustrating this broad definition, chapter authors discuss a range of paradata across multiple survey modes. For example, some investigate call-history data produced during computer-assisted telephone interviewing (CATI) and computer-assisted personal interviewing (CAPI) contact attempts, which may include timestamps and attempt-level disposition codes. Others write about interviewer observations of housing units and sampled persons, for example, access impediments recorded during contact attempts and interviewer-documented household attributes related to key estimates such as the presence of a wheelchair ramp for health surveys. Others examine self-reported survey mode paradata including, but not limited to, questionnaire navigation data available from some web surveys that can reproduce a respondent’s entire survey experience by recording mouse clicks and position, keystrokes, scrolling, page navigation, and timestamps. Such a comprehensive definition gives the fifteen-chapter book freedom to cover a variety of topics across the planning, data collection, and post-survey adjustment and analysis phases of the survey lifecycle.

Kreuter groups the book’s chapters into three parts. Part One, Paradata in Survey Errors, applies the Total Survey Error framework as an organizing approach to discuss particular uses of paradata. Kreuter and Olson briefly examine the general concept of nonresponse bias and then explain how paradata have been used to identify nonresponse bias and perform nonresponse bias adjustments. The next two chapters similarly illustrate the use of paradata as they relate to measurement error summarizing the concept of measurement error in general. Olson and Parkhurst detail types of paradata produced across survey modes, while Yan and Olson briefly review studies that used paradata to investigate measurement error, giving four empirical examples. Eckman focuses on coverage error,

¹ U.S. Census Bureau, Center for Survey Measurement, 4600 Silver Hill Road, Washington, DC, 20233, U.S.A.
Email: gina.k.walejko@census.gov

introducing readers to the concepts of undercoverage and overcoverage, and then explores how paradata can be used to uncover coverage bias across stages of frame construction.

Paradata in *Survey Production*, the second part of the book, not only is valuable in highlighting applications of paradata in surveys but also provides useful information on a variety of timely topics, for example, responsive design (Chapter 6), modeling best contact time (Chapter 7), within-survey requests such as consent for record linkage (Chapter 8), control charts and other quality control displays (Chapter 9), and representivity indicators (Chapter 10). Kirgis and Lepkowski introduce readers to the redesign of the 2006-2010 National Survey of Family Growth, focusing on five design changes that relied on paradata. Wagner illustrates the use of paradata-driven models to predict the best time of day to contact respondents in two surveys. Sakshaug outlines how paradata could increase response rates to four types of within-survey requests, including administrative record linkage, biomeasure collection, data-collection mode switching, and requesting sensitive information. Jans, Sirkis, and Morgan examine how survey managers can use paradata-based statistical quality control displays to manage survey performance. Schouten and Calinescu describe how paradata can be used to monitor contact, participation, and measurement “profiles” (i.e., classes of respondents that may be prone to measurement error), using the Dutch Labour Force Survey to show how administrative record data reveals measurement profiles associated with increased social desirability and satisficing behavior.

Part Three of the book, *Special Challenges*, includes five chapters dedicated to techniques for which the uses of paradata are not clear or may be challenging to utilize. Callegaro discusses device type, questionnaire navigation, and online panel web survey paradata, ending with the challenges of using such data, including privacy considerations and level of aggregation after collection. Durrant, D’Arrigo, and Müller give an overview of several multilevel modeling approaches that utilize call record data as model inputs, using two survey datasets to illustrate research questions these models could answer. Schafer describes how a Bayesian penalized-spline modeling approach can be used in statistical process modeling with paradata, thus allowing process means to vary over time. West and Sinibaldi perform a review of paradata quality, including an examination of mechanisms that may lead to errors in computer-generated and interviewer-observed paradata, and, finally, West presents the simulated results of weighting class adjustments when error levels of paradata vary.

The book’s success can be attributed to the description of paradata and their uses in survey design, implementation, and analysis, and also to the care taken to clarify particular concepts. In addition to careful explanations of nonresponse (Chapter 2), measurement (Chapters 3 and 4), and coverage errors (Chapter 5), other chapters offer background information on survey and statistical concepts in the book. For example, Jans and colleagues discuss the history of control charts, the basic components of graphical displays, and rules for determining whether a subgroup mean is out of control (Chapter 9). Schafer devotes a large portion of his chapter to reviewing the uses of splines and showing how a penalized spline can be treated as a linear mixed model (Chapter 13). Although not related to paradata directly, the detailed overview of such concepts make chapters useful to both paradata newcomers and to experts looking to apply techniques explained in the book.

Although the book presents problems associated with the collection, analysis, and use of certain types of paradata, it offers a myriad of helpful suggestions for how to answer questions generated by these problems. Eckman encourages researchers to look at coverage bias in addition to coverage rates, stating: “Paradata can and should play an important role in this transition” (Chapter 5, p. 15). Wagner suggests several avenues for future investigations including optimal trip planning for face-to-face interviewers that incorporates clustered cases (Chapter 7), and West and Sinibaldi conclude that the entire chapter warrants additional evaluations of paradata quality (Chapter 14).

Improving Surveys with Paradata: Analytic Uses of Process Information adds to a list of excellent titles in the Wiley Series in Survey Methodology. The combination of teaching survey and statistical concepts with cutting-edge uses of paradata and challenges associated with such applications positions the book as a valuable resource for a broad audience, from students of survey methodology looking for a thesis project to seasoned survey practitioners solving a particular survey problem to veteran researchers analyzing paradata across multiple modes and studies. Although the applications of paradata will continue to evolve over time, the information presented in this book’s chapters provides evidence of paradata’s usefulness and persistence in the improvement of surveys.