Q2014 Training Course 3

<u>Title:</u>

THE TOTAL SURVEY ERROR PARADIGM-

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COURSE OBJECTIVES

The *Total Survey Error (TSE) paradigm* embodies the best principles, strategies, and approaches for minimizing the survey error from all sources within time, costs, and other constraints that may be imposed on the survey. The TSE paradigm can be viewed as resting on four pillars of survey methodology corresponding to survey (a) design, (b) implementation, (c) evaluation, and (d) data analysis. Regarding (a), the TSE paradigm specifies that surveys should be designed to maximize data accuracy subject to budgetary and other constraints by minimizing the cumulative effects of error from all known sources. For (b), the paradigm specifies that strategies should be in place to monitor the major error sources, adapting the survey design as necessary to minimize the TSE through real-time interventions and design modifications. Regarding (c), the TSE paradigm emphasizes the importance of regularly assessing the joint effects of survey error on estimation and analysis so that continuous improvement and future design optimizations are possible. Finally, for (d), the TSE paradigm specifies that data analysis should appropriately consider the complex sampling design and the effects of nonsampling errors on the analytical results.

Structured around these four pillars, the course presents the best methods and lessons learned by the instructors over four decades of survey practice in government, academia, and private industry. Examples of issues that will be discussed include:

- the evolution of the TSE paradigm, Total Survey Quality, and how they relate,
- the design of surveys to reduce the effects of nonresponse, frame coverage error, measurement error, and data processing error,
- survey error measures, metrics, and monitoring strategies based upon real-time paradata,
- incorporating adaptive total design (ATD) during data collection to control survey costs and quality,
- the design of studies for assessing specific error sources such as nonresponse, frame noncoverage, interviewer errors, mode effects, and data processing error, and
- introduction to methods for analyzing complex survey data that compensate for nonresponse and measurement errors, including latent variable modeling.

THE INSTRUCTORS

Paul Biemer holds a joint appointment with the Odum Institute, University of North Carolina and RTI International, where he is a Distinguished Fellow. He also holds adjunct faculty appointments in the University of Maryland Joint Program for Survey Research and in the University of Michigan Survey Research Center. Biemer has more than 25 years of experience in survey methods and statistics. He specializes in evaluating survey quality and is a leading expert on statistical modeling, analysis, and interpretation of survey results. Biemer has a Ph.D. in statistics from Texas A&M University. His research interests include: Measurement error in surveys; nonsampling error modeling and estimation; general survey methodology and statistical methods. Biemer is the author of the recent book Latent Class Analysis of Survey Error, Wiley 2010, coauthor of Introduction to Survey Quality, Wiley 2003

and coeditor of three monographs, namely Telephone Survey Methodology, Wiley 1988, Measurement Errors in Surveys, Wiley 1991, and Survey Measurement and Process Quality, Wiley 1997. He is the recipient of the 2012 Roger Herriott Award.

Lars Lyberg, is former Senior Methodologist at the Director General's Office at Statistics Sweden and currently Professor Emeritus at the Statistics Department, Stockholm University. He has a Ph.D in statistics from Stockholm University. He is the founder of the Journal of Official Statistics (JOS) (http://www.jos.nu/) and currently Chairman of its Editorial Board after serving as Chief Editor for 25 years. His research interests include survey quality, history of survey research, business excellence models and quality management. He is chief editor of Survey Measurement and Process Quality (Wiley, 1997) and co-editor of Survey Methods in Multinational, Multiregional, and Multicultural Contexts (Wiley, 2010), Telephone Survey Methodology (Wiley, 1988) and Measurement Errors in Surveys (Wiley, 1991). He is co-author of Introduction to Survey Quality (Wiley, 2003). He chaired the Leadership Group on Quality of the European Statistical System and chaired the Organizing Committee of the first Quality Conference in this series, Q2001. He is former president of IASS and former chair of the ASA Survey Methods Section. He is the recipient of the 2012 Waksberg Award and the 2013 WAPOR Helen Dinerman Award.

TENTATIVE SCHEDULE

Morning session

- 1. The Total Survey Error Paradigm and Total Survey Quality
- 2. Designing surveys with a TSE perspective
- 3. Survey error metrics and quality control based on paradata

Afternoon session

- 4. Adaptive Total Design during data collection
- 5. Assessing the effects of main error sources
- 6. Strategies for achieving total survey quality using quality management tools and information on error magnitudes