Panel on Adaptive Survey Design

Financial contributions to this event by:

Special thanks to the Gallup Organization for use of their facilities.

Panel on Adaptive Survey Design

- Opening Remarks – Scott Fricker
- Cost and Data Quality Indicators – Peter Miller
- Paradata and Displays – Andrew Mercer and Frauke Kreuter
- Systems Infrastructure – Anup Mather and Michael Thieme
- Models and Interventions – Andy Peytchev
- Concluding Remarks – Frauke Kreuter

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Scott S. Fricker

February 10, 2014

Traditional Survey Design

- Specify and standardize all aspects of design
- Implement those specifications
  - All sample units receive same treatment/design features
  - Variations are ad hoc and not well documented/tracked
- Analyze data conditional on design protocols

- Methods developed to control sampling and measurement error in the survey process
- Methods effective in surveys where costs and errors are subject to small uncertainty

Motivation for Adaptive Approaches

- In practice, the survey environment often is difficult to predict
  - True with new surveys, but also with existing surveys
- Increasing concern over rising costs and potential bias in survey estimates
- Interest in optimizing quality given costs constraints by tailoring designs during collection

Adaptive Survey Design

- Assumes that different people may receive different treatments
- These treatments are defined before the start of survey, but they can be updated based on accumulating data observed during collection
  - Similar ideas are manifest in double sampling and two-phase designs
- Decisions are intended to improve the error and cost properties of the resulting statistics

Components of an Adaptive Design

- Identify survey design features potentially affecting the cost and error structures of survey statistics
- Identify indicators of cost and error structures of those features
- Monitor indicators during data collection
- Based on decision rule, actively change survey design features in subsequent collection period
- Combine data from across designs/periods to produce a single estimator

Adaptive vs. Responsive Design

- Terms often used interchangeably
- Both denote approaches
  - In which design features can be changed/tailored (e.g., to optimize cost, response rates, error)
  - Where different design features may be applied to different cases within the sample
  - Rely on data observed/captured during collection AND decision rules for making design changes
- Responsive designs divide collection into multiple design phases, with randomized experiments of treatments in each. Focus on phase or group-level interventions.
- Adaptive designs identify effective treatments, specify indicators, and decision rules ahead of time. Focus on continuous or case-level interventions.

Potential benefits of AD

- Pre-specified and fixed optimal designs are almost never achieved in practice
- Addresses issues associated with survey heterogeneous target populations
- Formalizing decisions enables better tracking of survey costs and errors
- Can help contain rising costs that are common in later stages of data collection
- Can offer evidence of reduced non-response and possibly other non-sampling errors

Benefits and Challenges, cont.

- AD involves other important areas of study
  - Analysis of paradata
  - Use of administrative data / Big data
  - Privacy / Confidentiality
  - Model development

- Challenges
  - Need extensive systems and documentation work
  - Model inputs need conceptual and measurement development and pretesting
  - Combining the data collected across phases
  - Sources of variability, conditional on prior phase

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