Dissertation Defense

"Investigating the Bias of Alternative Statistical Inference Methods in Mixed-Mode Surveys"

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Friday, September 13th, 10:30am

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In practice, survey modes are not randomly assigned in mixed-mode surveys. This dissertation proposes an alternate method that evaluates and adjusts for mode effects. The respondent data for a given mode and phase are used to create completed data sets for a given sample. Then, the completed data sets are used to compute mode-specific survey means. The survey means are then combined to produce one survey estimate. The ways in which the mean estimates can be combined are (1) a simple average, (2) a minimum variance combination, and (3) a minimum mean square error combination. The last of these requires some measure of true values that are unaffected by mode effects. The dissertation includes conceptual work and empirical/simulation evaluation of inference methods. The conceptual work includes extension of a single survey mode statistical error model to a mixed-mode survey context. The bias properties of the standard method, which ignores mode effects, and proposed methods, which adjust for mode effects under a simple measurement model, are investigated.

The dissertation work includes three studies. Two studies use a special type of data that include hypothetical true values at the person level. The data, Current Population Survey (CPS) 1973 Match Data, include both survey and Internal Revenue Services (IRS) data. The first empirical study focuses on a variable of interest, wage and salary income, for which measurement complexities are minimal. The following simulation study augments the data to include cases with more complicated measurement properties. Varying degrees of mode effects were simulated based on the observed data to evaluate the proposed methods under more complicated situations. Since both studies include benchmark values, which may not be the usual case, a third study conducts a sensitivity analysis for both personal income and health insurance coverage for which no benchmark values are available.