# Dissertation Defense

## The Error Properties of Interviewer Observations and their Implications for Nonresponse Adjustment of Survey Estimates

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## Thursday, October 20 at, 9:00 am

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Survey statisticians use auxiliary variables available for both respondents and nonrespondents to a survey request to compute post-survey nonresponse adjustments to survey estimates. Methodological studies have shown that the most effective auxiliary variables for reducing the bias and variance in survey estimates that arises from nonresponse are correlated with both survey response indicators and the survey variables of interest. Unfortunately, available auxiliary variables are often not highly correlated with survey variables of interest in practice, and nonresponse adjustments based on such variables may fail to decrease bias while increasing variance. As a result, many surveys conducting in-person interviews request that field interviewers observe and record selected characteristics of all sampled households, and then use these observations to compute nonresponse adjustments. However, these observations are generally estimates and judgments, making them prone to error. The implications of these errors for the effectiveness of nonresponse adjustments have received very little research attention.

This dissertation presents results from three research studies designed to fill this important gap in the literature. The first study will analyze the error properties of two interviewer observations collected in the National Survey of Family Growth (NSFG), examine the effectiveness of nonresponse adjustments based in part on the observations, and simulate the implications of errors in the observations for the effectiveness of weighting class adjustments for nonresponse. The second study will use multilevel modeling techniques to assess respondent- and interviewer-level predictors of accuracy in the NSFG interviewer observations. The third study will develop pattern-mixture model (PMM) estimators for the case when an available auxiliary variable is error-prone, true values for the auxiliary variable are collected from survey respondents, and the true values are predictive of unit nonresponse under a non-ignorable missing data mechanism, and then evaluate the performance of the PMM estimators and other popular estimators under various error scenarios. Collectively, these three studies aim to 1) provide survey researchers with practical guidance regarding the use of interviewer observations to make post-survey nonresponse adjustments, and 2) provide both empirical and theoretical support for a research program examining the wide-ranging implications of errors in auxiliary variables for survey researchers.