A copy of the following paper will appear on the post-conference website. Please check the following link after January 15, 2006.

http://www.fcsm.gov/reports/

Variance Estimation and Inference from Complex Survey Data in the Presence of Interviewer-Level Measurement Error

John Eltinge and Moon Jung Cho (Bureau of Labor Statistics, USA) and Partha Lahiri (Joint Program in Survey Methodology, University of Maryland, USA)

In the analysis of data collected through a complex sample design, one generally needs to account for variability associated both with customary sampling errors and with measurement errors. For cases in which measurement errors are attributable to individual

sample elements (e.g., sample households or sample establishments), it is relatively simple to extend standard design-based methods for variance estimation and inference. However, such extensions become more complex for cases in which a substantial portion of measurement error effects are attributable to interviewers, rather than to sample elements. Following a review of previous literature in the area, this paper focuses on three inter-related problems. First, we consider stratified multistage sample designs in which some interviewers collect data in more than one primary sample unit (PSU). We develop a simple collapse-based variance estimator which is conservative under mild regularity conditions. In addition, we discuss related inference issues involving confidence sets and coverage rates. Second, we extend the first case to cases in which measurement error variances may be associated with specified characteristics of the sample units (e.g., household or establishment size or composition) and of the interviewers (e.g., experience or workload). Third, we use a hierarchical model to evaluate some properties of the first two sets of methods, and to develop some alternative variance estimators. The principal ideas are motivated by, and illustrated with, a specific application to the Consumer Expenditure Interview Survey.