

DISCUSSION

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The papers presented at this session cover a wide variety of issues in the area of measurement of the variance component of survey error. The papers taken as a whole are interesting in that they provide an overview of the research that is currently being undertaken.

Berry's paper was of particular interest to this discussant since it confronts the problem faced by Statistics Canada in connection with the 1981 Census. The problem is to measure response variance without a replication or interpenetration model that would provide multiple observations on each interview. The solution described in this paper is appealing in its skillful use of simple statistical techniques. However, two caveats should be mentioned. First, to what extent have the control variables accounted for all the variance other than that introduced by the interviewer? It might be possible to test the multiple regression models using data from another survey carried out under similar circumstances but which includes an interpenetrated or replicated scheme. The second reservation is that, as is usually the case with estimates of correlated response variance, the results are small and of questionable reliability. This should be kept in mind when drawing conclusions such as those based on comparisons with the U.S. Census Bureau results, which themselves are also small and unreliable. Finally, since one of the principal objectives is to measure performance of relatively novice interviewers, response rates and measures of bias might also be considered as measures of performance.

The papers by Katzoff and Biemer describe an ambitious plan for the measurement of variance due to several sources in the 1980 U.S. Census. Certainly it seems that resulting information may prove very useful in the design of future large-scale surveys. Data on errors at the many stages throughout the survey process are sorely lacking. Questions not addressed in these papers but which might be reported on in the future are the cost of such an operation (both direct dollar costs and indirect costs due to the added complications), the soundness of the many assumptions (some of them being quite heroic), and the reliability of the final results.

The research described by Groves and Magilavy is characterized by the fact that variance estimates

are analyzed for their substantive content. It is encouraging to see that the results do not diverge widely from estimates based on surveys not conducted via telephone. At least fairly consistent results are being obtained over different types of surveys. The importance of attempts at substantive interpretation cannot be overemphasized. If resources are to be allocated for measuring survey error, it is with the idea that substantive and methodological conclusions can be drawn from the results. Too often, these results are calculated, sometimes published, and very seldom ever referred to again.

Weber's results on variance estimation for the U.S. Consumer Price Index are informative in that they show how complex some estimators can become. Furthermore, it indicates how powerful the Balanced Repeated Replication method is since it permits variance calculation in situations such as this where not only the estimator but also the sample design are complex.

The last presentation by Biyani proposes a different variance estimation technique under unequal probability sampling. The estimation is model-based and is shown to be superior to design-based results if the mean squared error is used as the criterion. The generalizability of the results are not clear but it does seem that even if the model is not satisfied, the estimate is still more efficient. The empirical results are based on small sample sizes (10 or less) thus the applicability of this research to general surveys cannot be readily evaluated.

In conclusion, it should be noted that, whereas the titles of the session and some papers refer to "survey error", in fact, without exception, all papers deal with "survey variance". This obsession with variance indicates that this might be an appropriate moment to declare a moratorium on research on measuring variance. The problems in this area lend themselves to interesting solutions with statistical techniques but, by and large, the results are relatively small, unstable, and rather uninformative. From a practitioner's point of view, it would seem far more profitable to concentrate the efforts of survey statisticians who want to measure error, on measuring bias and its sources such as undercoverage, questionnaire design, and method of enumeration. It has repeatedly been shown that it is bias, not variance, which dominates total survey error.