September 19, 2005

Professor John Stufken
JSPI Executive Editor
Department of Statistics,
University of Georgia,
Athens, Georgia 30602-1952

RE: JSPI submission 04-02

Dear Professor Stufken,

Please find enclosed a copy of our manuscript titled “Design-Based Random Permutation Models with Auxiliary Information” that Dr. Edward J. Stanek III and myself have prepared. The content of this article, a part of my Ph.D. thesis, has not been published or submitted elsewhere.

This paper was previously submitted to JSPI as a manuscript titled “Covariance Adjusted Estimation under a Design-based Random Permutation Model” (JSPI submission 04-02). In response to your suggestion and the constructive comments from two reviewers, we have revised the manuscript by using simpler and conventional notation, adding a simpler and transparent illustrative example, re-organizing its sections and rewriting many parts of the paper.

This paper is a follow-up of a paper by Stanek, Singer and Lencina (2004) that appeared in JSPI (121: 325-338) and a paper by Stanek and Singer (2004) appeared in JASA (99: 1119-1130). In this paper we extend their design-based prediction method to incorporate auxiliary information under simple random sampling without replacement. This paper bridges their results to practical applications. The random permutation model is extended by the joint permutation of the response and auxiliary variables, with auxiliary information incorporated through centering the auxiliary variables on their respective means. The estimators are required to be linear functions of the sample, unbiased and have minimum mean squared error. The estimators are identical to model-assisted and calibration estimators. However, the results provide the building blocks for extending the design-based random permutation model theory to include covariates in more complicated sample designs. This theory has already been extended to predict realized random effects in a mixed model using similar design-based methods applied to a random permutation model for a clustered population. The results developed here broaden the scope of the theory by directly extending it to include covariates. The concordance of results with other less systematic approaches is an added appeal of the methodology.

We look forward to your review and comment.

Yours sincerely,

Wenjun Li