A Resampling Approach to Estimate Variance Components of Multilevel Models

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With the presence of unequal probability sampling in a multilevel model, although the use of survey weights results in design consistent estimators of the parameters, the weight inflated estimators for variance components can be biased when the sample size at the first level is fixed. In this paper, we propose a resampling method which serves as an alternative to weight scaling methods, and provides bias correction factors for the underlying estimators of the variances. The small sample properties of the estimators of parameters for a multilevel model from this resampling method are studied through simulations using populations generated from a simple random model and the Canadian Workplace and Employee Survey.

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