Title:
Improving the Design of Cluster Randomized Trials in Education and Prevention Research

Session Chair:
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Paper 1:
Strategies for Improving Power in Cluster Randomized Studies of Professional Development

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Paper 2:
Intraclss Correlations for Three-Level Multi-Site Cluster-Randomized Trials of Science Achievement

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Paper 3:  
Meaningful Effect Sizes, Intra-class Correlations, and Proportions of Variance Explained by Covariates for Planning 3 Level Cluster Randomized Experiments in Prevention Science

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Paper 4:  
Estimating the Variance of Design Parameters

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Symposium Justification

Cluster randomized trials (CRTs) are commonly used to test the effectiveness of programs across many domains including education and prevention science. In order for a CRT to have the capacity to yield rigorous evidence of the effectiveness of a program, it must be designed with adequate power to detect a meaningful treatment effect. In addition to the sample sizes at all levels, the power for a CRT is highly dependent on the following design parameters: 1) the intraclass correlation(s), 2) the percent of variance explained by covariate(s), 3) the magnitude of the effect, and 4) the variation of treatment effects across sites (for the multi-site CRT). Accurate estimates of these design parameters are essential for planning CRTs.

The purpose of this symposium is to provide empirical estimates of design parameters for various types of CRTs across several domains. The first paper focuses on teacher level outcomes. The findings from this study will be useful in planning CRTs to test the effectiveness of professional development program for teachers. The second paper centers on student level science outcomes and is particularly relevant for teams planning multi-site CRTs of science programs and interventions. The Third paper focuses on social-emotional outcomes for children and provides empirical estimates that will inform the design of CRTs of school-based prevention programs. The fourth paper is applicable to the design of multi-site CRTs in any domain and considers the appropriateness of different estimators of the treatment effect heterogeneity. Together the set of papers provide valuable information that will help improve the design of CRTs in education and prevention research.