

IMPS 2024

Prague, Czech Republic

July 16–19, 2024 • Short Courses July 15

Addendum

Updated Presentation Title:

Foundational Competencies in Educational Measurement vs. Quantitative Psychology: IMPS/NCME Perspectives

Wednesday, July 17 • 9:00 a.m. - 10:15 a.m.

Chair: Prof. Andrew Ho

Discussant: Prof. Terry Ackerman

Foundational Competencies in Educational Measurement: An NCME Task Force Consensus

Wednesday, July 17 • 9:00 a.m. - 10:15 a.m.

Prof. Andrew Ho

What does it mean to be a psychometrician?

Wednesday, July 17 • 9:00 a.m. - 10:15 a.m.

Prof. Ying (Alison) Cheng

Some Reflections on Foundational Competencies in Quantitative Psychology

Wednesday, July 17 • 9:00 a.m. - 10:15 a.m.

Prof. David Thissen

A Role of Theory and Values as Foundational Aspects of Quantitative Psychology

Wednesday, July 17 • 9:00 a.m. - 10:15 a.m.

Prof. David Torres Iribarra

Updated Poster Abstract:

Revisiting estimation in hierarchical modeling

Prof. Zhenqiu Lu

University of Georgia

Multilevel models, also referred to as hierarchical linear models or mixed-effects models, are widely used for analyzing data with a nested or hierarchical structure. In such data, lower-level units, like students or individuals, are nested within higher-level units such as classes, schools, or organizations. Various estimation methods exist for fitting multilevel models to data, including Full Maximum Likelihood Estimation (FML), Restricted Maximum Likelihood Estimation (REML), and Bayesian Estimation methods. Additionally, exploratory estimation methods are also available, such as exploratory Ordinary Least Squares (OLS) estimation, which entails fitting separate regression models at each level of the hierarchy.

In this study, we revisit parameter estimation in Optimal Sample Allocation for multi-site randomized trials. In Optimal Sample Allocation research, the central objective is to determine the sample size or allocation of resources across different treatment groups or experimental conditions to maximize the study's efficiency and precision. The framework of multi-site randomized trials is hierarchical modeling. The dominant estimation method involves fitting an exploratory OLS regression model to each individual to derive lower-level intercepts and slopes, and these resulting intercepts and slopes are either averaged across higher-level units or regressed on higher-level predictors. We first revisit the parameter estimation in this framework and discuss the advantages and disadvantages of this method. We also propose other Optimal Sample Allocation methods by incorporating alternative estimation approaches. Results will be compared, and conclusions will be provided.