



Using Multiple Group Multilevel Latent Models for Cross-Country Comparisons: Empirical Application with PIRLS 2011 Data

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Abstract

Recent educational effectiveness models outline the complex nature of learning processes describing them as an interaction of individual and family characteristics with school factors. Although these attempts may help to surpass simplistic input-output models, the empirical implementation remains challenging for educational researchers. Additionally, in Large Scale Assessments (LSA) (e.g. PIRLS, PISA), the complex study design requires special analysis techniques for the computation of robust standard errors. This contribution provides an empirical application of Multilevel Structural Equation Modeling (MSEM) with LSA data (Lüdtke et al., 2008; Marsh et al., 2009), a method that is suitable for reflecting the complexity of the data and learning processes at schools. Extending MSEM to multiple group analysis (MG-MSEM) an elaborated procedure for cross-country comparisons is presented (Hox & Mass, 2001). Using PIRLS data (Mullis, Martin, Foy, & Drucker, 2012), the model analyzes characteristics of learning environment (e.g. student composition, school management) that can mitigate social inequalities improving learning outcomes of socially disadvantaged students. The results show that school factors, such as student composition, classroom climate, and teacher ability can mitigate social inequality in schools. The presentation addresses specific topics related to the data design, for instance weighting and plausible values. Limitations of the method are discussed together with methodological issues, such as inferring causality, validation of latent constructs, linear vs. categorical approaches.

Keywords: multiple group multilevel latent models; large scale assessments; social inequalities; complex data.

References

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