Handling Nonnormal Latent Densities in Multilevel/Multidimensional Item Factor Models

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Abstract

When the assumption of normality in the population latent trait distribution is not tenable in item response theory (IRT) applications, researchers can take the nonnormality into account using non-Gaussian distributions such as the empirical histogram (EH; Bock & Aitkin, 1981; Mislevy, 1984), nonparametric curves (e.g., Ramsey or Davidian curves; Woods & Thissen, 2006; Monroe, 2014), the skewed t distribution (Asparouhov & Muthén, 2015), and finite mixtures of latent distributions (e.g., Cho, Cohen, & Kim, 2014). In this talk, some of these approaches are discussed and extended to apply to multilevel/multidimensional item response theory models (a multilevel bifactor model and a two-tier model) estimated with Bock and Aitkin’s expectation and maximization (EM) algorithm. The findings of simulation studies conducted to evaluate the impact of nonnormal latent densities on item parameter estimates and recovery of latent densities will be discussed as well as issues in applying procedures in practice.

If you have questions about this seminar, contact Professor Mark Davison, mld@umn.edu.

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