

Bayesian Lasso Confirmatory Factor Analysis

Lijin Zhang

Department of Psychology, Sun Yat-sen University

Joint work with

Junhao Pan

Department of Psychology, Sun Yat-sen University

Edward Haksing Ip

Wake Forest School of Medicine

Confirmatory factor analysis (CFA) has been widely used in psychological research to investigate the structure of latent variables. However, strict constraints are imposed on traditional CFA (e.g., conditional independence between items given factor, no cross-loading). As a result, fitting data to CFA with strong assumptions often leads to poor model fit. A commonly used method to improve model fit is to tweak residual covariances and cross-loadings based on modification indexes (MIs). However, the MI approach requires fixing the coefficients one at a time. When there are many MIs, the procedure is not efficient, and subjective choice of what to modify could lead to biased estimates. To relax these strict assumptions, we integrated the Bayesian Lasso method with CFA by replacing the exact-zero constraints with Laplace prior. Simulation studies were conducted to demonstrate the effectiveness of Bayesian Lasso CFA. We further developed an R package ‘blcfa’ to facilitate its usage. In the presentation, we will provide a brief overview of the Bayesian Lasso CFA method and illustrate its practical implementation through a real data example.

Keywords: confirmatory factor analysis, Bayesian Lasso, model modification