Comparison between different parameters identification criteria using the Bayesian Lasso

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The lasso is a commonly used regularization method that is increasingly adopted in structural equation modeling. For example, lasso is used to derive a sparse representation of the cross-loadings in confirmatory factor analysis. Under the Bayesian framework, lasso is rendered more flexible and readily produces estimates of standard error and the penalty parameter. However, in practice it remains unclear what decision rule is appropriate for parameter identification. In other words, the issue of determining what size estimate is considered large enough to be included into the model needs to be solved. The current study compared three different decision rules for parameter identification—thresholding, *p*-value, and credible interval, within the context of confirmatory factor analysis. Specifically, two distinct parameter spaces were studied: cross-loadings and residual correlations across items. Results showed that the thresholding rule performed best in balancing power and Type I error rate. It was also shown that different thresholds for standardized estimates were needed for different conditions. In this presentation, we will also discuss guidelines for parameter identification and thresholding values based on the result of the simulation studies. We will further discuss how findings of the current study can be extended to a broader context in structural equation models.

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