A Bayesian analysis of mixture structural equation models with non-ignorable missing Data

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Abstract:
   In behavioral, biomedical, and social-psychological sciences, it is common to encounter latent variables and heterogeneous data. Mixture structural equation models (SEMs) are very useful methods to analyze these kinds of data. Moreover, the presence of missing data, including both missing responses and missing covariates, is an important issue in practical research. However, limited work has been done on the analysis of mixture SEMs with non-ignorable missing responses and covariates. The main objective of this research is to develop a Bayesian approach for analyzing mixture SEMs with an unknown number of components, in which a multinomial logit model is introduced to assess the influence of some covariates on the component probability. Results of our simulation study show that the Bayesian estimates obtained using the proposed method are accurate, and the model selection procedure via a modified DIC is useful in identifying the correct number of components and in selecting an appropriate missing mechanism in the proposed mixture SEMs. A real data set related to a longitudinal study of polydrug use is employed to illustrate the methodology.