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Title:

Instrumental variable identification of factor analysis models with complex structures

Abstract:

Factor analysis models are used to estimate the covariance structure of a set of latent variables based on the observed covariance of their observed variables (i.e. indicators). Existing rules of identification for “confirmatory” factor analysis models rely on each latent variable having at least one indicator that loads solely on it. Existing rules of identification for “exploratory” factor analysis models rely on a diagonal covariance matrix for the measurement errors. I will present sufficient rules of identification for models with complex loading structures and complex error structures and some fairly simple methods for determining when the conditions apply. Along the way I will demonstrate an equivalence of the confirmatory and exploratory approaches. This has implications for estimation and specification testing for factor analysis models which will be briefly discussed. Most importantly, you will learn why I ask strange questions about matrices.