A title

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A nice abstract goes here.

1 Introduction

The structural equation models are

$$\begin{aligned}
\mathbf{y} &= \boldsymbol{\nu} + \boldsymbol{\Lambda}\boldsymbol{\eta} + \boldsymbol{\epsilon} \\
\boldsymbol{\eta} &= \boldsymbol{\alpha} + \mathbf{B}\boldsymbol{\eta} + \boldsymbol{\zeta} \\
\boldsymbol{\epsilon} &\sim \mathrm{N}(\mathbf{0}, \boldsymbol{\Theta}_{\boldsymbol{\epsilon}}) \\
\boldsymbol{\zeta} &\sim \mathrm{N}(\mathbf{0}, \boldsymbol{\Psi})
\end{aligned} \tag{1}$$

where $\boldsymbol{\Lambda}$ is the factor loading matrix, $\boldsymbol{\eta}$ is the latent variable vector, $\boldsymbol{\epsilon}$ is the measurement error vector, $\boldsymbol{\nu}$ is the intercept vector, $\boldsymbol{\alpha}$ is the intercept vector for the latent variables, $\mathbf{B}$ is the regression coefficient matrix for the latent variables, and $\boldsymbol{\Theta}_{\boldsymbol{\epsilon}}$ and $\boldsymbol{\Psi}$ are the covariance matrices of the measurement errors and latent variables, respectively. The model defined by Equation 1 is very nice.

2 Methods

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Figure 1: Here's a caption.

We need to update Figure 1 to a better one in the future!

References

Bartholomew, D. J., Knott, M., & Moustaki, I. (2011). *Latent variable models and factor analysis: A unified approach* (3rd ed). Wiley.

Bollen, K. A. (1989). *Structural equations with latent variables* (pp. xiv, 514). John Wiley & Sons. https://doi.org/10.1002/9781118619179

Jöreskog, K. G., & Moustaki, I. (2001). Factor Analysis of Ordinal Variables: A Comparison of Three Approaches. *Multivariate Behavioral Research*, *36*(3), 347–387. https://doi.org/10.1207/S15327906347-387

Lee, S.-Y. (2007). *Structural equation modeling: A Bayesian approach*. Wiley.

Rue, H., Martino, S., & Chopin, N. (2009). Approximate Bayesian Inference for Latent Gaussian models by using Integrated Nested Laplace Approximations. *Journal of the Royal Statistical Society Series B: Statistical Methodology*, *71*(2), 319–392. https://doi.org/10.1111/j.1467-9868.2008.00700.x

Appendix

3 Derivatives

$$\begin{aligned}
\frac{\partial \ell(\theta)}{\partial \theta} &= \frac{\partial}{\partial \theta}\left(\sum_{i=1}^{n} \log p(x_i|\theta)\right) \\
&= \sum_{i=1}^{n} \frac{\partial}{\partial \theta} \log p(x_i|\theta) \\
&= \sum_{i=1}^{n} \frac{1}{p(x_i|\theta)} \frac{\partial p(x_i|\theta)}{\partial \theta}
\end{aligned}$$

4 Additional proof

Please look at Theorem 4.1.

Theorem 4.1. *There are an in finite number of primes.*

Proof. Assume there are a finite number of primes, say $p_1, p_2, \ldots, p_n$. Consider the number $N = p_1 p_2 \cdots p_n + 1$. This number is not divisible by any of the primes $p_1, p_2, \ldots, p_n$ (since it leaves a remainder of 1 when divided by any of them). Therefore, N must either be prime itself or have a prime factor that is not in our original list, contradicting the assumption that we had listed all primes. Thus, there are an infinite number of primes. □