

# Lijin Zhang

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Psychometrics, Bayesian Analysis, Structural Equation Models

## EDUCATION

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### Stanford University

· Ph.D. student in Development and Psychological Science 2022 - present  
(Advisors: Prof. Ben Domingue & Prof. Jason Yeatman)

### Sun Yat-sen University

· M.S. in Psychology 2019 - 2022  
· B.S. in Psychology 2015 - 2019

## RESEARCH EXPERIENCES

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*Note. [x] refers to the journal articles, working papers, and software packages in the publication list.*

**Domingue Lab, Stanford University** 09/2022 - present

Advisor: Prof. Ben Domingue  
Research Topics: Model Selection [18], Item Response Theory [16]

**Brain Development & Education Lab, Stanford University** 04/2023 - present

Website: <https://www.brainandeducation.com>  
Advisor: Prof. Jason Yeatman  
Research Topics: Applied Psychometrics

**Psychological Statistics and Modeling Lab, Sun Yat-sen University** 09/2017 - 06/2022

Advisor: Prof. Junhao Pan  
Research Topics: Bayesian Lasso Confirmatory Factor Analysis [5,6,8,20,39]  
Mediation and Moderation Analysis. [9]  
Longitudinal Data Analysis [11]

**Lab for Big Data Methodology, University of Notre Dame** Summer, 2021

Website: <https://bigdatalab.nd.edu>  
Advisor: Prof. Zhiyong Johnny Zhang  
Research Topics: Text Mining & Network Analysis [2]

**Prof. Xinya Liang's Lab, University of Arkansas** Summer, 2020

Advisor: Prof. Xinya Liang  
Research Topics: Bayesian Regularization, Structural Equation Modeling [1]

## PUBLICATIONS

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**Journal Articles** (+ indicates co-first author, \* indicates correspondent author)

1. **Zhang, L.**, & Liang, X.\* (accepted). Bayesian Regularization in Multiple-Indicators Multiple-Causes Models. *Psychological Methods*.
2. **Zhang, L.**, Li, X., & Zhang, Z. (accepted). Variety and Mainstays of the R Developer Community. *The R Journal*.
3. Zheng, S., **Zhang, L.**, Jiang, Z., & Pan, J. (2023). The Influence of Using Inaccurate Priors on Bayesian Multilevel Estimation. *Structural Equation Modeling*, 30 (3), 429-448. [[pdf](#)]

4. Wei, X.<sup>+</sup>, Huang, J.<sup>+</sup>, **Zhang, L.**, Pan, D.<sup>\*</sup>, & Pan, J.<sup>\*</sup> (2022). Evaluation and Comparison among SEM, ESEM and BSEM in Estimating Structural Models with Potentially Unknown Cross-loadings. *Structural Equation Modeling*, 29 (3), 327-338. [\[pdf\]](#)
5. **Zhang, L.**, Pan, J.<sup>\*</sup>, & Ip, E.H. (2021). Criteria for Parameter Identification in Bayesian Lasso Methods for Covariance Analysis: Comparing Rules for Thresholding,  $p$ -value, and Credible Interval. *Structural Equation Modeling*, 28 (6), 941-950. [\[pdf\]](#)
6. **Zhang, L.**, Pan, J.<sup>\*</sup>, Dubé, L., & Ip, E.H. (2021). blcfa: An R Package for Bayesian Model Modification in Confirmatory Factor Analysis. *Structural Equation Modeling*, 28 (4), 649-658. [\[pdf\]](#)
7. Zeng, G., **Zhang, L.**, Fung, S.<sup>\*</sup>, Li, J., Liu, Y-M., Xiong, K-Z., Jiang, Z-Q., Zhu, F-F., Chen, Z-T., Luo, S-D., Yu, P., & Huang, Q. (2021). Problematic Internet Usage and Self-Esteem in Chinese Undergraduate Students: The Mediation Effects of Individual Affect and Relationship Satisfaction. *International Journal of Environmental Research and Public Health*, 18 (13), 6949. [\[pdf\]](#)
8. Chen, J.<sup>\*</sup>, Guo, Z., **Zhang, L.**, & Pan, J.<sup>\*</sup> (2021). A Partially Confirmatory Approach to Scale Development with the Bayesian Lasso. *Psychological Methods*, 26 (2), 210-235. [\[pdf\]](#)
9. Feng, Q.<sup>+</sup>, Song, Q.<sup>+</sup>, **Zhang, L.**<sup>+</sup>, Zheng, S., & Pan, J.<sup>\*</sup> (2020). Integration of Moderation and Mediation in a Latent Variable Framework: A Comparison of Estimation Approaches for the Second-stage Moderated Mediation Model. *Frontiers in Psychology*, 11, 2167. [\[pdf\]](#)
10. Liu, S., Huang, Z., **Zhang, L.**, Pan, J., Lei, Q., Meng, Y., & Li, Z.<sup>\*</sup> (2020). Plasma Neurofilament Light Chain may be a Biomarker for the Inverse Association between Cancers and Neurodegenerative Diseases. *Frontiers in Aging Neuroscience*, 12 (10), 1-8. [\[pdf\]](#)

#### In Chinese:

11. Zheng, S., **Zhang, L.**, Qiao, X., & Pan, J.<sup>\*</sup> (2021). Intensive Longitudinal Data Analysis: Models and Application. *Advances in Psychological Science*, 29 (11), 1948-1969. [\[pdf\]](#)
12. Zhang, X., **Zhang, L.**, Ding, Y., Qu, Z.<sup>\*</sup> (2021). Behavioral Oscillations in Attention. *Advances in Psychological Science*, 29 (3): 461-471. [\[pdf\]](#)
13. **Zhang, L.**, Wei, X., Lu, J., & Pan, J.<sup>\*</sup> (2020). Lasso Regression: From Explanation to Prediction. *Advances in Psychological Science*, 28 (10), 1777-1788. [\[pdf\]](#)
14. **Zhang, L.**, Lu, J., Wei, X., & Pan, J.<sup>\*</sup> (2019). Bayesian Structural Equation Modeling and Its Current Research. *Advances in Psychological Science*, 27 (11), 1812-1825. [\[pdf\]](#)

#### Manuscripts Drafted

15. Gu, X., Zhu, X., **Zhang, L.**, Pan, J.<sup>\*</sup> (submitted). Testing Informative Hypotheses in Factor Analysis Models using Bayes Factors.
16. Ahmed, I., Bertling, M., **Zhang, L.**, Ho, A., Loyalka, P., Xue, H., Rozelle, S., & Domingue, B.W. (submitted). Heterogeneity of item-treatment interactions masks complexity and generalizability in randomized controlled trials. [\[preprint\]](#)
17. Wang, E., Kennedy, K.M., **Zhang, L.**, Qian, D., Forbes, T., Rodriguez, S., Zuniga-Hernandez, M., Li, B., Domingue, B.W., & Caruso, T.J. (submitted). Predicting Pediatric Healthcare Provider Use of Virtual Reality using a Technology Acceptance Model.
18. **Zhang, L.**, Zhang, Z., Kanopka, K., Ulitzsch, E., & Domingue, B.W. (manuscript drafted). The InterModel Vigorish for Model Comparison in Confirmatory Factor Analysis with Binary Outcomes.

19. **Zhang, L.**, Liang, X., & Pan, J. (manuscript drafted). Comparison Between Bayesian and Frequentist Regularization in Factor Analysis.
20. Pan, J., **Zhang, L.**, & Ip, E.H.\* (manuscript drafted). Bayesian Covariance Adaptive Lasso Factor Analysis Models with Ordinal Data.

### **Invited Talk**

21. **Zhang, L.**, & Pan, J.\* (2022). Latent Multiple Mediation Analysis with the Bayesian Lasso. The 15th Chinese R Conference, 25 Nov, Virtual. [[slides](#)]
22. **Zhang, L.**, Pan, J., & Ip, E.H., (2022). *Bayesian Lasso Confirmatory Factor Analysis*. Utrecht University, 23 May, Virtual. [[abstract](#)][[slides](#)]
23. **Zhang, L.**, Lu, J., Wei, X., & Pan, J.\* (2019). *Bayesian Structural Equation Modeling and Its Current Research*. The 12th Chinese R Conference, 24-26 May, Beijing. [[abstract](#)][[slides](#)]

### **Contributed Conference Presentations** (underline: presenter)

24. **Zhang, L.**, & Domingue, B.W. (To be presented). *The InterModel Vigorish for Model Comparison in Confirmatory Factor Analysis with Binary Outcomes*. International Meeting of Psychometric Society, 25-28 July, Maryland, USA. [[slides](#)]
25. **Zhang, L.**, Liang, X., & Pan, J. (To be presented). *Comparison between Bayesian and Frequentist Regularization in Factor Analysis*. International Meeting of Psychometric Society, 25-28 July, Maryland, USA. [[slides](#)]
26. **Zhang, L.**, & Domingue, B.W. (2023). *The InterModel Vigorish for Model Comparison in Confirmatory Factor Analysis with Binary Outcomes*. Annual Meeting of the International Society for Data Science and Analytics, 4-6 July, Shanghai. [[slides](#)]
27. **Zhang, L.**, & Liang, X.\* (2023). *Bayesian Regularization in Multiple Indicators Multiple Causes Models*. National Council on Measurement in Education Annual Meeting, 12-15 April, Chicago, USA.
28. Ip, E.H., Sandberg, J., **Zhang, L.**, & Pan, J.\* (2022). *Matched-pair Binary Item Response Analysis Using Bayesian Adaptive Lasso Factor Model*. International Meeting of Psychometric Society, 11-15 July, Bologna, Italy.
29. **Zhang, L.**, & Pan, J.\* (2021). *How to Select Prior Variance in Bayesian Approximate Measurement Invariance?* The 6th Eastern Chapter of International Society for Bayesian Analysis Conference, 17 November, Virtual.
30. **Zhang, L.**, & Liang, X.\* (2021). *Bayesian Regularization in Multiple Indicators Multiple Causes Models*. International Meeting of Psychometric Society, 19-23 July, Virtual. [[abstract](#)][[slides](#)]
31. **Zhang, L.**, Pan, J.\*, & Ip, E.H. (2021). *Comparison between Different Parameter Identification Criteria using the Bayesian Lasso*. International Meeting of Psychometric Society, 19-23 July, Virtual. [[abstract](#)][[slides](#)]
32. Pan, J., **Zhang, L.**, & Ip, E.H.\* (2021). *Bayesian Covariance Adaptive Lasso Factor Analysis Models with Ordinal Data*. International Meeting of Psychometric Society, 19-23 July, Virtual. [[abstract](#)]
33. **Zhang, L.**, Pan, J.\*, & Ip, E.H. (2020). *blcfa: An R package for Bayesian Model Modification in Confirmatory Factor Analysis*. International Meeting of Psychometric Society, 14-17 July, Virtual. [[abstract](#)][[slides](#)]
34. **Zhang, L.**, Lu, J., Zhang, Y., & Pan, J.\* (2019). *The Influence of Social Support on Career Decision-Making Difficulty: Bayesian Modeling Based on Longitudinal Data*. The 22nd National Academic Conference of Psychology, 18-20 Oct, Hangzhou. [[abstract](#)][[poster](#)]

35. Pan, J., **Zhang, L.**, & Ip, E.H.\* (2018). *Bayesian Lasso Factor Analysis Models with Ordered Categorical Data*. The 13th Cross-Straits Conference on Educational and Psychological Testing, 22-25 Oct, Taiwan. [[abstract](#)][[slides](#)]
36. Pan, J., **Zhang, L.**, Ip, E.H.\* (2017). *Bayesian Lasso Factor Analysis Models with Ordered Categorical Data*. The 20th Chinese Academic Conference of Psychology, 3-5 November, Chongqing.

## Book Chapters

37. **Computational Neuroscience and Cognitive Modelling - Chinese Version (Anderson, 2014)**  
Translated chapters 9-13 (Neural Networks).
38. **Handbook of Quantitative Methods in Psychological and Behavioral Research (in Chinese)**  
Wrote the Bayesian Structural Equation Modeling chapter with Prof. Junhao Pan.

## Software Development

39. **Zhang, L.**, Pan, J., & Ip, E.H. (2020). *blcfa: An R Package for Bayesian Model Modification in Confirmatory Factor Analysis*. Retrievable from <https://github.com/zhanglj37/blcfa>.
40. **Zhang, L.**, Sun, R., & Pan, J. (2020). *sampleMplus: An R Package for Sample Size Determination in Structural Equation Modeling*. Retrievable from <https://github.com/zhanglj37/sampleMplus>.

## GRANTS

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National Innovation Training Program for Undergraduates, China	2018
Climbing Plan for Undergraduate and Graduate Students, Guangdong Province	2018

## HONORS & AWARDS

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EDGE Fellowship, Stanford University	2022
Outstanding Graduates, Sun Yat-sen University	2022
First Prize Scholarship of Outstanding Students, Sun Yat-sen University	2017 - 2021
National Scholarship, Minister of Education of China	2020
Third Prize, Outstanding Thesis Award, Chinese Psychological Society	2019
Outstanding Undergraduate Thesis, Sun Yat-sen University	2019
Outstanding Presenter, Undergraduate Psychology Forum, Peking University	2018

## PROFESSIONAL EXPERIENCES

### Instructor / Teaching Assistant

· Instructor, Workshop on Bayesian Structural Equation Modeling	2023
· Instructor, Workshop on Structural Equation Modeling with Mplus	2023
· TA, Workshop on Experience Sampling Method	2022
· TA, Advanced Structural Equation Modeling, Sun Yat-sen University	2021
· TA, Structural Equation Modeling, Sun Yat-sen University	2020
· TA, Psychological Statistics, Sun Yat-sen University	2020

### Data Analyst & Statistical Consultant

· Data Analyst, <a href="#">Chariot Lab</a> , Lucile Packard Children's Hospital, Stanford University <sup>[17]</sup>	2022 - present
· Data Analyst, The Science of Well-being Research Institute, Guangdong, China <sup>[7]</sup>	2021 - 2022
· Statistical Consultant, Ni Lab, Tsinghua Shenzhen International Graduate School	2020
· Statistical Consultant, Pang Lab, School of International Relations, Sun Yat-sen University	2019 - 2020

### Reviewer

- Structural Equation Modeling
- Journal of Behavioral Data Science
- Science Progress
- British Journal of Mathematical and Statistical Psychology
- BMC Medical Research Methodology
- BMC Psychology

**Memberships**

- Psychometric Society
- Capital of Statistics, China
- National Council on Measurement in Education