

# Lijin Zhang

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Psychometrics, Quantitative Psychology, Educational Measurement

## EDUCATION

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### Stanford University

- Ph.D. Candidate in Developmental and Psychological Science
- Advisors: Prof. Ben Domingue; Prof. Jason Yeatman

2022 - present

### Sun Yat-sen University

- M.S. in Psychology
- B.S. in Psychology

2019 - 2022

2015 - 2019

## PUBLICATIONS

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**Journal Articles** (<sup>†</sup> indicates alphabetical order or reverse, \* indicates correspondent author)

1. Wang, E., Kennedy, K.M., **Zhang, L.**, Qian, D., Forbes, T., Zuniga-Hernandez, M., Li, B.S., Domingue, B.W., & Caruso, T.J. (accepted). A Technology Acceptance Model to Predict Anesthesiologists' Clinical Adoption of Virtual Reality. *Journal of Clinical Anesthesia*.
2. He, E., Arshad, F., Li, B.S., Brinda, R., Ganesan, A., **Zhang, L.**, Fehr, S., Renavikar, M., Rodriguez, S.T., Wang, E., Rosales, O., & Caruso, T.J. (2024). Awe Inducing Elements in Virtual Reality Applications: A Prospective Study of Hospitalized Children and Caregivers. *Games for Health Journal*. Advance Online Publication. [[doi](#)]
3. Ahmed, I., Bertling, M., **Zhang, L.**, Ho, A., Loyalka, P., Xue, H., Rozelle, S., & Domingue, B.W. (2024). Heterogeneity of item-treatment interactions masks complexity and generalizability in randomized controlled trials. *Journal of Research on Educational Effectiveness*. Advance Online Publication. [[doi](#)]
4. **Zhang, L.**, & Liang, X.\* (2023). Bayesian Regularization in Multiple-Indicators Multiple-Causes Models. *Psychological Methods*. Advance Online Publication. [[doi](#)]
5. Gu, X., Zhu, X., **Zhang, L.**, & Pan, J.\* (2023). Testing Informative Hypotheses in Factor Analysis Models using Bayes Factors. *Psychological Methods*. Advance Online Publication. [[doi](#)]
6. **Zhang, L.**, Li, X., & Zhang, Z. (2023). Variety and Mainstays of the R Developer Community. *R Journal*, 15(3), 5-25. [[doi](#)]
7. Wang, E. Y., Kennedy, K. M., **Zhang, L.**, Qian, D., Forbes, T., Zuniga-Hernandez, M., Li, B. S-K., Domingue, B.W., & Caruso, T.J. (2023). Predicting pediatric healthcare provider use of virtual reality using a technology acceptance model. *Journal of the American Medical Informatics Association Open*, 6(3), ooad076. [[doi](#)]
8. 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. [[doi](#)]
9. Wei, X.<sup>†</sup>, Huang, J.<sup>†</sup>, **Zhang, L.**, Pan, D.\*, & Pan, J.\* (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. [[doi](#)]
10. **Zhang, L.**, Pan, J.\*, & 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. [[doi](#)]

11. **Zhang, L.**, Pan, J.\* , 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. [doi]
12. Zeng, G., **Zhang, L.**, Fung, S.\* , 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. [doi]
13. Chen, J.\* , Guo, Z., **Zhang, L.**, & Pan, J.\* (2021). A Partially Confirmatory Approach to Scale Development with the Bayesian Lasso. *Psychological Methods*, 26 (2), 210-235. [doi]
14. Zheng, S., **Zhang, L.**, Qiao, X., & Pan, J.\* (2021). Intensive Longitudinal Data Analysis: Models and Application. *Advances in Psychological Science*, 29 (11), 1948-1969. [doi]
15. Zhang, X., **Zhang, L.**, Ding, Y., Qu, Z.\* (2021). Behavioral Oscillations in Attention. *Advances in Psychological Science*, 29 (3): 461-471. [doi]
16. Feng, Q.<sup>†</sup>, Song, Q.<sup>†</sup>, **Zhang, L.**<sup>†</sup>, Zheng, S., & Pan, J.\* (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. [doi]
17. Liu, S., Huang, Z., **Zhang, L.**, Pan, J., Lei, Q., Meng, Y., & Li, Z.\* (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. [doi]
18. **Zhang, L.**, Wei, X., Lu, J., & Pan, J.\* (2020). Lasso Regression: From Explanation to Prediction. *Advances in Psychological Science*, 28 (10), 1777-1788. [doi]
19. **Zhang, L.**, Lu, J., Wei, X., & Pan, J.\* (2019). Bayesian Structural Equation Modeling and Its Current Research. *Advances in Psychological Science*, 27 (11), 1812-1825. [doi]

## Manuscripts Drafted

20. **Zhang, L.**, Ulitzsch, E., & Domingue, B.W. (submitted). Bayesian Factor Mixture Modeling with Response Time for Detecting Careless Respondents. [preprint]
21. **Zhang, L.**, Kanopka, K.<sup>†</sup>, Rahal, C.<sup>†</sup>, Ulitzsch, E.<sup>†</sup>, Zhang, Z.<sup>†</sup>, & Domingue, B.W. (manuscript drafted). The InterModel Vigorish for Model Comparison in Confirmatory Factor Analysis with Binary Outcomes. [preprint]
22. **Zhang, L.**, Qu, W., & Zhang, Z. (manuscript drafted). Bayesian Growth Curve Modeling with Measurement Error in Time.
23. **Zhang, L.**, Liang, X., & Pan, J. (manuscript drafted). Comparison Between Bayesian and Frequentist Regularization in Factor Analysis.
24. **Zhang, L.**, Liu, Y., Gilbert, J.B., & Domingue, B.W. (manuscript drafted). Incorporating Characteristics of Real-World Item Difficulty Distributions into Simulation Design.
25. **Zhang, L.**, Domingue, B.W., Vogelsmeier, V., & Ulitzsch, E. (manuscript drafted). Careless Respondents Detection for Visual Analogue Scale Data.
26. Domingue, B.W., Kanopka, K.<sup>†</sup>, Ulitzsch, E.<sup>†</sup>, & **Zhang, L.**<sup>†</sup> (manuscript drafted). Implied probabilities of polytomous response functions for model-based prediction and comparison. [preprint]
27. Gilbert, J.B., **Zhang, L.**, Ulitzsch, E., Domingue, B.W. (submitted). Polytomous Explanatory Item Response Models for Item Discrimination: Assessing Negative-Framing Effects in Social-Emotional Learning Surveys. [preprint]

28. Shen, H., Stafford, C., Meijssen, J., **Zhang, L.**, Reiter, J., Lawn, R.B., Smith, A.K., Vermuri, M., & Duncan, L.E. (submitted). Testosterone levels predict future PTSD symptoms among middle and older age UK residents.
29. Pan, J., **Zhang, L.**, & Ip, E.H.\* (manuscript drafted). Bayesian Covariance Adaptive Lasso Factor Analysis Models with Ordinal Data.
30. Domingue, B.W., Kanopka, K., Braginsky, M., **Zhang, L.**, Caffrey-Maffei, L., Kapoor, R., Liu, Y., Zhang, S., & Frank, M. (manuscript drafted). The Item Response Warehouse. [[preprint](#)]

### Invited Talk

31. **Zhang, L.**, Domingue, B.W., Vogelsmeier, V., & Ulitzsch, E. (To be presented). *Mixture Modeling for Identifying Careless Responding*. The Norwegian Psychometrics Gathering, 19-20 Sep, Stavanger.
32. **Zhang, L.**, Qu, W., & Zhang, Z. (2023). *Bayesian Growth Curve Modeling with Measurement Error in Time*. University of Notre Dame, 31 Aug, South Bend, USA. [[slides](#)]
33. **Zhang, L.**, & Pan, J.\* (2022). *Latent Multiple Mediation Analysis with the Bayesian Lasso*. The 15th Chinese R Conference, 25 Nov, Virtual. [[slides](#)]
34. **Zhang, L.**, Pan, J., & Ip, E.H., (2022). *Bayesian Lasso Confirmatory Factor Analysis*. Utrecht University, 23 May, Virtual. [[slides](#)]
35. **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. [[slides](#)]

### Contributed Conference Presentations (underline: presenter)

36. **Zhang, L.**, Ulitzsch, E., & Domingue, B.W. (2024). *Bayesian Factor Mixture Modeling with Response Time for Detecting Careless Respondents*. International Meeting of Psychometric Society, 16-19 July, Prague, Czech.
37. Domingue, B.W., Kanopka, K., Ulitzsch, E., & **Zhang, L.** (2024). *The Item Response Warehouse*. International Meeting of Psychometric Society, 16-19 July, Prague, Czech.
38. Cao, C., Liang, X., **Zhang, L.**, & Lu, M. (2024). *The Performance of Bayesian Fit Measures in Approximate Measurement Invariance Testing in Cross-Cultural Research*. International Meeting of Psychometric Society, 16-19 July, Prague, Czech.
39. **Zhang, L.**, Qu, W., & Zhang, Z. (2024). *Bayesian Growth Curve Modeling with Measurement Error in Time*. Annual Meeting of the International Society for Data Science and Analytics, 21-24 July, Vienna, Austria.
40. **Zhang, L.**, Kanopka, K.<sup>†</sup>, Rahal, C.<sup>†</sup>, Ulitzsch, E.<sup>†</sup>, Zhang, Z.<sup>†</sup>, & Domingue, B.W. (2024). *The InterModel Vigorish for Model Comparison in Confirmatory Factor Analysis with Binary Outcomes*. Stanford Data Science Conference, 7 May, California, USA.
41. Domingue, B.W., Kanopka, K., Ulitzsch, E., & **Zhang, L.** (2024). *Implied Probabilities of Polytomous Response Functions for Model-Based Prediction and Comparison*. National Council on Measurement in Education Annual Meeting, 11-14 April, Philadelphia, USA.
42. **Zhang, L.**, & Domingue, B.W. (2023). *The InterModel Vigorish for Model Comparison in Confirmatory Factor Analysis with Binary Outcomes*. International Meeting of Psychometric Society, 25-28 July, Maryland, USA. [[slides](#)]
43. **Zhang, L.**, Liang, X., & Pan, J. (2023). *Comparison between Bayesian and Frequentist Regularization in*

*Factor Analysis*. International Meeting of Psychometric Society, 25-28 July, Maryland, USA. [slides]

44. **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]
45. **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.
46. 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.
47. **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.
48. **Zhang, L.**, & Liang, X.\* (2021). *Bayesian Regularization in Multiple Indicators Multiple Causes Models*. International Meeting of Psychometric Society, 19-23 July, Virtual. [slides]
49. **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. [slides]
50. 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.
51. **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. [slides]
52. **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. [poster]
53. 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. [slides]
54. 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

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

## Software Development

57. **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>.
58. **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>.

## HONORS & AWARDS

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|  |             |
|--|-------------|
| EDGE Fellowship, Stanford University                                     | 2022 - 2027 |
| GSE Travel Fellowship, Stanford University                               | 2023 - 2024 |
| Outstanding Graduates, Sun Yat-sen University                            | 2022        |
| National Scholarship, Minister of Education of China                     | 2020        |
| First Prize Scholarship of Outstanding Students, Sun Yat-sen University  | 2017 - 2021 |
| Outstanding Thesis Award, Chinese Psychological Society                  | 2019        |
| Outstanding Undergraduate Thesis, Sun Yat-sen University                 | 2019        |
| Outstanding Presenter, Undergraduate Psychology Forum, Peking University | 2018        |

## RESEARCH EXPERIENCES IN PSYCHOMETRICS

|   |                      |
|---|----------------------|
| <i>Note. [x] refers to the papers in the publication list.</i>  | <i>Starting Date</i> |
| <b>Domingue Lab, Stanford University</b>  | 09/2022              |
| Advisor: Prof. Ben Domingue   |                      |
| Research Topics: Model Selection <sup>[21]</sup> , Process Data Analysis <sup>[20]</sup><br>Item Response Models <sup>[3,26,30,27,24]</sup>   |                      |
| <b>Centre for Educational Measurement, University of Oslo</b>   | Summer, 2024         |
| Advisor: Prof. Esther Ulitzsch  |                      |
| Research Topics: Mixture Modeling <sup>[20,31]</sup>  |                      |
| <b>Lab for Big Data Methodology, University of Notre Dame</b>   | Summer, 2021         |
| Advisor: Prof. Zhiyong Johnny Zhang   |                      |
| Research Topics: Text Mining & Network Analysis <sup>[6]</sup> , Longitudinal Analysis <sup>[22]</sup>  |                      |
| <b>Liang Lab, University of Arkansas</b>  | Summer, 2020         |
| Advisor: Prof. Xinya Liang  |                      |
| Research Topics: Bayesian Regularization, Structural Equation Modeling <sup>[4,23]</sup>  |                      |
| <b>Psychological Statistics and Modeling Lab, Sun Yat-sen University</b>  | 09/2019              |
| Advisor: Prof. Junhao Pan   |                      |
| Research Topics: Bayesian Lasso Confirmatory Factor Analysis <sup>[5,10,11,13,29,23]</sup><br>Mediation and Moderation Analysis <sup>[16]</sup> , Longitudinal Analysis <sup>[14]</sup> |                      |

## RESEARCH EXPERIENCES ON SUBSTANTIVE TOPICS

|   |                |
|---|----------------|
| <i>Data Analysis Collaborations with Research Labs in Psychology, Education, and Medicine</i> | <i>Date</i>    |
| · LEVANTE Project, Language & Cognition Lab, Stanford University                              | 2024 - present |
| · ROAR Project, Brain Development & Education Lab, Stanford University                        | 2023 - present |
| · Chariot Program, Lucile Packard Children's Hospital, Stanford University <sup>[1,2,7]</sup> | 2022 - present |
| · The Science of Well-being Research Institute, Guangdong, China <sup>[12]</sup>              | 2021 - 2022    |
| · Ni Lab, Tsinghua Shenzhen International Graduate School                                     | 2020           |
| · Pang Lab, School of International Relations, Sun Yat-sen University                         | 2019 - 2020    |

## TEACHING EXPERIENCES

|   |             |
|---|-------------|
| · Instructor, Workshop on Bayesian Structural Equation Modeling     | 2023 - 2024 |
| · Instructor, Workshop on Structural Equation Modeling with Mplus   | 2023 - 2024 |
| · 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        |

## PROFESSIONAL EXPERIENCES

## **Reviewer**

- Structural Equation Modeling
- Journal of Behavioral Data Science
- Science Progress
- British Journal of Mathematical and Statistical Psychology
- BMC Medical Research Methodology
- BMC Psychology
- American Educational Research Association Annual Meeting
- R Journal
- Frontiers in Psychology

## **Grants**

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

## **Memberships**

- Psychometric Society
- Capital of Statistics, China
- International Society for Data Science and Analytics