

## **Zhiyong Johnny Zhang, Ph.D.**

Professor

University of Notre Dame

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### **Contact Information**

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### **Education**

|      |                                   |                            |
|------|-----------------------------------|----------------------------|
| 2008 | Ph.D. of Quantitative Psychology  | University of Virginia     |
| 2005 | Master of Quantitative Psychology | University of Virginia     |
| 2003 | Master of Statistics              | Renmin University of China |
| 2000 | Bachelor of Statistics            | Renmin University of China |

### **Employment**

|              |                              |                                       |
|--------------|------------------------------|---------------------------------------|
| 2020–Current | Professor                    | University of Notre Dame              |
| 2016–Current | Fellow                       | Institute for Educational Initiatives |
| 2015–2020    | Associate Professor          | University of Notre Dame              |
| 2010–2015    | Assistant Professor          | University of Notre Dame              |
| 2008–2010    | Research Assistant Professor | University of Notre Dame              |

### **Honors and Awards**

|           |                                                                                                                             |
|-----------|-----------------------------------------------------------------------------------------------------------------------------|
| 2025      | Barbara Byrne Award for Outstanding Book on Multivariate Analysis                                                           |
| 2025      | Best Paper Award, International Society for Data Science and Analytics                                                      |
| 2024      | Jacob Cohen Award for Distinguished Contributions to Teaching and Mentoring, Division 5, American Psychological Association |
| 2023      | Joyce Award for Excellence in Undergraduate Teaching, University of Notre Dame                                              |
| 2019      | Tanaka Award for Best Article in Multivariate Behavioral Research                                                           |
| 2019      | Elected Fellow, Division 5, American Psychological Association                                                              |
| 2018–2024 | President, International Society for Data Science and Analytics                                                             |
| 2018      | SMEP Early Career Research Award, Society of Multivariate Experimental Psychology                                           |
| 2016      | Elected member, Society of Multivariate Experimental Psychology                                                             |
| 2007–2008 | Dissertation Award, Society of Multivariate Experimental Psychology                                                         |

2007–2008 Dissertation Year Presidential Fellowship, University of Virginia  
 2007 Young Scientists Scholarship, Annual Meeting of the Psychometric Society  
 2006, 2007 Travel Award, American Psychological Association  
 2005–2007 Robert J. Huskey Travel Award, University of Virginia  
 2005, 2007 Travel Award, Society of Multivariate Experimental Psychology  
 2003–2008 Presidential Fellowship, University of Virginia Graduate School

### PhD Students Mentored

2025 Lingbo Tong (Tenure-track assistant professor at University of Wisconsin, Madison)  
 2024 Sijing Shao (Tenure-track assistant professor at Florida International University, Co-advised with Ross Jacobucci and Guangjian Zhang)  
 2022 Tyler Wilcox (Statistical Consultant at Cornell University, Co-advised with Lijuan Wang)  
 2021 Change Che (Now senior data scientist at Facebook)  
 2021 Wen Qu (Now tenure-track assistant professor at the Fudan University)  
 2018 Haiyan Liu (Now tenure-track assistant professor at the University of California, Merced)  
 2017 Megan Cain (Now Senior Statistician at StataCorp, started as a research assistant professor at University of Texas at San Antonio, co-advised with Ke-Hai Yuan)  
 2014 Xin Tong (Now tenured associate professor at the University of Virginia)  
 2011 Zhenqiu Lu (Now tenured associate professor at the University of Georgia, co-advised with Ke-Hai Yuan)

### Editorial Service

2024-Current Editorial Board, Computation  
 2021–Current Editor, Journal of Behavioral Data Science  
 2020–Current Associate Editor (Editorial Board), Neurocomputing  
 2016–2025 Associate Editor, Multivariate Behavioral Research  
 2014–Current Consulting Editor (Editorial Board), Psychological Methods

### Selected Grants and Sponsored Programs

#### External (funded)

1. *Bayesian Longitudinal Data Modeling in Education Sciences.*  
 Begin-End Dates: 2024–2027  
 Funding source: Institute of Education Sciences  
 Role: Co-PI  
 PI: Cynthia Tong, University of Virginia  
 Amount: \$792,636
2. *Methods and Software for Handling Network Data and Text Data in Structural Equation Modeling.*  
 Begin-End Dates: 2021–2025  
 Funding source: Institute of Education Sciences

Role: PI (Co-PI: Ke-Hai Yuan, Lijuan Wang)  
Amount: \$861,354

3. *Structural Equation Modeling with Small N and Large p.*

Begin-End Dates: 2015–2018  
Funding source: National Science Foundation  
Role: Co-PI  
PI: Ke-Hai Yuan, University of Notre Dame  
Amount: \$430,725

4. *A General Framework for Statistical Power Analysis with Non-normal and Missing Data through Monte Carlo Simulation.*

Begin-End Dates: 2014–2018  
Funding source: Institute of Education Sciences  
Role: PI (Co-PI: Ke-Hai Yuan)  
Amount: \$573,097

Internal

1. *Machine Learning Methods for Handling Nonlinear Relationships in Psychometric Models*

Begin-End Dates: 2022-2024  
Funding source: Lucy Family Institute  
Role: PI (Co-PI: Meng Jiang, Jun Li)  
Amount: \$66,000

2. *A Longitudinal Social Network Approach to Understanding the Relationship between Friendship and Alcohol Use among College Students*

Begin-End Dates: 2020-2023  
Funding source: Asia Research Collaboration Grant  
Role: PI  
Amount: \$17,415

3. *A Web Interface for Drawing Path Diagrams for Structural Equation Modeling.*

Begin-End Dates: 2012–2013  
Funding source: Center for Creative Computing & Institute for Scholarship in the Liberal Arts  
Role: PI  
Amount: \$4,000 & \$2,500  
Note: The project was jointly funded by CCC and ISLA that allowed us

4. *A General Bayesian Estimation Method for Structural Equation Modeling.*

Begin-End Dates: 2009–2010  
Funding source: Faculty Research Grants  
Role: PI

Amount: \$10,000

5. *Seed Grants for Cooperative Projects: Daily Religious Research.*  
Begin-End Dates: 2009–2010  
Funding source: Institute for Scholarship in the Liberal Arts  
Role: PI

## Journal Articles

1. Du, H., Liu, F., Zhang, Z., & Enders, C. (accepted). Demystifying Posterior Distributions: A Tutorial on Their Derivation. *Multivariate Behavioral Research*. <https://doi.org/10.1080/00273171.2025.2570250>
2. \*Tong, L., & Zhang, Z. (accepted). Neural Network Analysis of Psychological Data: A Step-by-Step Guide. *Multivariate Behavioral Research*. <https://doi.org/10.1080/00273171.2025.2587379>
3. \*Parra, D., Zhang, Z. & Radvansky, G. A. (accepted). Should We All Just Take 10? A Meta-Analysis of Wakeful Rest. *Psychonomic Bulletin & Review*.
4. \*Xu, Z. & Zhang, Z. (in press). Structural Equation Models with Social Networks. *Structural Equation Modeling: A Multidisciplinary Journal*. <https://doi.org/10.1080/10705511.2025.2488030>
5. \*Shao, S., \*Xu, Z., Liu, Q., McClure, K., Jacobucci, R., Maxwell, S. M., & Zhang, Z. (accepted). Zero inflation in intensive longitudinal data: why is it important and how should we deal with it? *Psychological Methods*. <https://doi.org/10.1037/met0000754>
6. Liu, X., Zhang Z., & Wang, L. (accepted). Detecting mediation effects with the Bayes factor: Performance evaluation and tools for sample size determination. *Psychological Methods*. <https://doi.org/10.1037/met0000670>
7. \*Wyman, A., & Zhang, Z. (2025). Evaluating the Threat of Phantom Faces in Emotion Detection AI through Simulation. *Journal of Behavioral Data Science*, 5(2), 1-15. <https://doi.org/10.35566/jbds/wyman51>
8. \*Wyman, A. & Zhang, Z. (2025). A Tutorial on the Use of Artificial Intelligence Tools for Facial Emotion Recognition in R. *Multivariate Behavioral Research*, 60(3), 641-655. <https://doi.org/10.1080/00273171.2025.2455497>
9. Yuan, K.-H., & Zhang, Z. (2025). Parameterizing the LISREL Model as a Correlation Structure Model for More Efficient Parameter Estimates and More Powerful Statistical Tests. *Structural Equation Modeling: A Multidisciplinary Journal*, 32(3), 475-497. <https://doi.org/10.1080/10705511.2025.2450323>
10. \*Zhang, L., \*Qu, W., & Zhang, Z. (2025). Bayesian Growth Curve Modeling with Measurement Error in Time. *Multivariate Behavioral Research*, 60(4), 748-766. <https://doi.org/10.1080/00273171.2025.2473937>
11. \*Tong, L., Qu, W., & Zhang, Z. (2024). Comparison of the K1 Rule, Parallel Analysis, and the Bass- Ackward Method on Identifying the Number of Factors in Factor Analysis. *Fudan Journal of the Humanities and Social Sciences*, 1-28. <https://doi.org/10.1007/s40647-024-00423-2>
12. Yuan, K.-H., Ling, L., & Zhang, Z. (2024). Scale-invariance, equivariance and dependency of structural equation models. *Structural Equation Modeling: A Multidisciplinary Journal*, 31(6), 1027-1042. <https://doi.org/10.1080/10705511.2024.2353168>

13. Yuan, K.-H., Zhang Z., & Wang, L. (2024). Signal-to-Noise Ratio in Estimating and Testing the Mediation Effect: Structural Equation Modeling versus Path Analysis with Weighted Composites. *Psychometrika*, 89(3), 974-1006.  
<https://doi.org/10.1007/s11336-024-09975-4>
14. Yuan, K.-H., & Zhang, Z. (2024). Modeling Data with Measurement Errors but without Predefined Metrics: Fact versus Fallacy. *Journal of Behavioral Data Science*, 4(2), 1-28. <https://doi.org/10.35566/jbds/yuan>
15. \*Xu, Z., \*Gao, F., \*Fa, A., Qu, W., & Zhang, Z. (2024). Statistical Power Analysis and Sample Size Planning for Moderated Mediation Models. *Behavior Research Methods*, 56, 6130–6149. <https://doi.org/10.3758/s13428-024-02342-2>
16. \*Zhao, S., Zhang, Z., & Zhang, H. (2024). Bayesian Inference of Dynamic Mediation Models for Longitudinal Data. *Structural Equation Modeling: A Multidisciplinary Journal*, 31(1), 14-26. <https://doi.org/10.1080/10705511.2023.2230519>
17. Liu, X., Zhang, Z., Valentino, K., & Wang, L. (2024). The impact of omitting confounders in parallel process latent growth curve mediation models: Three sensitivity analysis approaches. *Structural Equation Modeling: A Multidisciplinary Journal*, 31(1), 132-150. <https://doi.org/10.1080/10705511.2023.2189551>
18. \*Zhang, L., +Li, X., & Zhang, Z. (2023). Variety and Mainstays of the R Developer Community. *R Journal*, 15(3), 5-25. <https://doi.org/10.32614/RJ-2023-060>
19. \*Wilcox, K. T., Jacobucci, R., Zhang, Z., & Ammerman, B. A. (2023). Supervised Latent Dirichlet Allocation with Covariates: A Bayesian Structural and Measurement Model of Text and Covariates. *Psychological Methods*, 28(5), 1178–1206.  
<https://doi.org/10.1037/met0000541>
20. \*Xu, Z., \*Hai, J., \*Yang, Y., & Zhang, Z. (2023). Comparison of Methods for Imputing Social Network Data. *Journal of Data Science*, 21(3), 599–618  
<https://doi.org/10.6339/22-JDS1045>
21. \*Wyman, A., & Zhang, Z. (2023). API Face Value: Evaluating the Current Status and Potential of Emotion Detection Software in Emotional Deficit Interventions. *Journal of Behavioral Data Science*, 3(1), 59–69. <https://doi.org/10.35566/jbds/v3n1/wyman>
22. \*Liu, X., Wang, L., & Zhang, Z. (2023). Bayesian hypothesis testing of mediation: Methods and the impact of prior odds specifications. *Behavior Research Methods*, 55, 1108-1120. <https://doi.org/10.3758/s13428-022-01860-1>
23. \*Mai, Y., \*Xu, Z., Zhang, Z., & Yuan, K.-H. (2023). An Open Source WYSIWYG Web Application for Drawing Path Diagrams of Structural Equation Models. *Structural Equation Modeling: A Multidisciplinary Journal*, 30(2), 328-335.  
<https://doi.org/10.1080/10705511.2022.2101460>
24. Krettenauer, T., Lefebvre, J. P., Hardy, S. A., Zhang, Z., & Cazzell, A. R. (2022) Daily moral identity: Linkages with integrity and compassion. *Journal of Personality*, 90(5), 663-674. <https://doi.org/10.1111/jopy.12689>
25. \*Liu, H. ., \*Qu, W., Zhang, Z., & Wu, H. (2022). A New Bayesian Structural Equation Modeling Approach with Priors on the Covariance Matrix Parameter. *Journal of Behavioral Data Science*, 2(2), 23–46. <https://doi.org/10.35566/jbds/v2n2/p2>
26. Lu, L., & Zhang, Z. (2022). How to Select the Best Fit Model among Bayesian Latent Growth Models for Complex Data. *Journal of Behavioral Data Science*, 2(1), 35–58.  
<https://doi.org/10.35566/jbds/v2n1/p2>

27. Lu, Z. (Laura)\*, & Zhang, Z. (2021). Bayesian Approach to Non-ignorable Missingness in Latent Growth Models. *Journal of Behavioral Data Science*, 1(2), 1–30.  
<https://doi.org/10.35566/jbds/v1n2/p1>
28. Zhang, Z. (2021). A Note on Wishart and Inverse Wishart Priors for Covariance Matrix. *Journal of Behavioral Data Science*, 1(2), 119–126.  
<https://doi.org/10.35566/jbds/v1n2/p2>
29. \*Liu, H., Jin, I.-H., Zhang, Z., & Yuan, Y. (2021). Social network mediation analysis: A latent space approach. *Psychometrika*, 86(1), 272-298.  
<https://doi.org/10.1007/s11336-020-09736-z>
30. Che, C.\*, Jin, I.-K., & Zhang, Z. (2021). Network Mediation Analysis Using Model-based Eigenvalue Decomposition. *Structural Equation Modeling*, 28(1), 148-161.  
<https://doi.org/10.1080/10705511.2020.1721292>
31. Zhang, Z. & \*Zhang, D. (2021). What is Data Science? An Operational Definition based on Text Mining of Data Science Curricula. *Journal of Behavioral Data Science* 1(1), 1-16. <https://doi.org/10.35566/jbds/v1n1/p1>
32. \*Liu, H. & Zhang, Z. (2021). Birds of a Feather Flock Together and Opposites Attract: The Nonlinear Relationship Between Personality and Friendship, *Journal of Behavioral Data Science* 1(1), 34-52. <https://doi.org/10.35566/jbds/v1n1/p3>
33. \*Kuang, Y., Zhang, Z., Duan, B., & Zhang, P. (2020). Fuzzy Cognitive Maps-based Switched-Mode Power Supply Design Assistant System. *IEEE Access*, 8, 183014-183024. <https://doi.org/10.1109/ACCESS.2020.3029090>
34. \*Tong, X., & Zhang, Z. (2020). Robust Bayesian approaches in growth curve modeling: Using Student's t distributions versus a semiparametric method. *Structural Equation Modeling*, 27(4), 544-560. <https://doi.org/10.1080/10705511.2019.1683014>
35. \*Wen, Q., \*Liu, H., & Zhang, Z. (2020). Generating multivariate non-normal random numbers with specified multivariate skewness and kurtosis. *Behavior Research Methods*, 52, 939–946. <https://doi.org/10.3758/s13428-019-01291-5>
36. \*Wilcox, L.T., Jacobucci, R. & Zhang, Z. (2019). Bayesian Supervised Topic Modeling with Covariates (Abstract). *Multivariate Behavioral Research*.  
<https://doi.org/10.1080/00273171.2019.1695568>
37. \*Du, H., Edwards, M., & Zhang, Z. (2019). Bayes factor in one-sample tests of means with a sensitivity analysis: A discussion of separate prior distributions. *Behavior Research Methods*, 51(5), 1998–2021. <https://doi.org/10.3758/s13428-019-01262-w>
38. Serang, S., Grimm, K. J., & Zhang, Z. (2019). On the correspondence between the latent growth curve and latent change score models. *Structural Equation Modeling*, 26(4), 623-635. <https://doi.org/10.1080/10705511.2018.1533835>
39. \*Cain, M. K., & Zhang, Z. (2019). Fit for a Bayesian: An evaluation of PPP and DIC for structural equation modeling. *Structural Equation Modeling*, 26(1), 39–50.  
<https://doi.org/10.1080/10705511.2018.1490648>
40. Yuan, K., Zhang, Z., & Deng, L. (2019). Fit indices for mean structures with growth curve models. *Psychological Methods*, 24(1), 36-53.  
<https://doi.org/10.1037/met0000186>
41. \*Liu, H., Jin, I. K., & Zhang, Z. (2018). Structural equation modeling of social networks: Specification, estimation, and application. *Multivariate Behavioral Research*, 53(5), 714–730. <https://doi.org/10.1080/00273171.2018.1479629>

42. ^Mai, Y., Zhang, Z., & Wen, Z. (2018). Comparing exploratory structural equation modeling and existing approaches for multiple regression with latent variables. *Structural Equation Modeling*, 25(5), 737–749. <https://doi.org/10.1080/10705511.2018.1444993>
43. ^Mai, Y., & Zhang, Z. (2018). Review of software packages for Bayesian multilevel modeling. *Structural Equation Modeling*, 25(4), 650–658. <https://doi.org/10.1080/10705511.2018.1431545>
44. \*Cain, M. K., Zhang, Z., & Bergeman, C. S. (2018). Time and other considerations in mediation design. *Educational and Psychological Measurement*, 78(6), 952–972. <https://doi.org/10.1177/0013164417743003>
45. \*Ke, Z., & Zhang, Z. (2018). Testing autocorrelation and partial autocorrelation: Asymptotic methods versus resampling techniques. *British Journal of Mathematical and Statistical Psychology*, 71(1), 96–116. <https://doi.org/10.1111/bmsp.12109>
46. \*Tong, X., & Zhang, Z. (2017). Outlying observation diagnostics in growth curve modeling. *Multivariate Behavioral Research*, 52(6), 768–788. <https://doi.org/10.1080/00273171.2017.1374824>
47. Zhang, Z., Jiang, K., \*Liu, H., & Oh, I.-S. (2017). Bayesian meta-analysis of correlation coefficients through power prior. *Communications in Statistics: Theory and Methods*, 46(24), 11988–12007. <https://doi.org/10.1080/03610926.2017.1288251>
48. \*Cain, M. K., Zhang, Z., & Yuan, K. (2017). Univariate and multivariate skewness and kurtosis for measuring nonnormality: Prevalence, influence and estimation. *Behavior Research Methods*, 49(5), 1716–1735. <https://doi.org/10.3758/s13428-016-0814-1>
49. \*Liu, H., & Zhang, Z. (2017). Logistic regression with misclassification in binary outcome variables: A method and software. *Behaviormetrika*, 44(2), 447–476. <https://doi.org/10.1007/s41237-017-0031-y>
50. Yuan, K.-H., Zhang, Z., & Zhao, Y. (2017). Reliable and more powerful methods for power analysis in structural equation modeling. *Structural Equation Modeling*, 24(3), 315–330. <https://doi.org/10.1080/10705511.2016.1276836>
51. \*Cheung, R. Y. M., Cummings, E. M., Zhang, Z., & Davies, P. (2016). Trivariate modeling of interparental conflict and adolescent emotional security: An examination of mother-father-child dynamics. *Journal of Youth and Adolescence*, 45(11), 2336–2352. <https://doi.org/10.1007/s10964-015-0406-x>
52. \*Liu, H., Zhang, Z., & Grimm, K. J. (2016). Comparison of inverse-Wishart and separation-strategy priors for Bayesian estimation of covariance parameter matrix in growth curve analysis. *Structural Equation Modeling*, 23 (3), 354–367. <https://doi.org/10.1080/10705511.2015.1057285>
53. Zhang, Z. (2016). Modeling error distributions of growth curve models through Bayesian methods. *Behavior Research Methods*, 48(2), 427–444. <https://doi.org/10.3758/s13428-015-0589-9>
54. Zhang, Z. & Yuan, K.-H. (2016). Robust coefficients alpha and omega and confidence intervals with outlying observations and missing data: Methods and software. *Educational and Psychological Measurement*, 76(3), 387–411. <https://doi.org/10.1177/0013164415594658>
55. Serang, S., Zhang, Z., Helm, J., Steele, J. S., & Grimm, K. J. (2015). Evaluation of a Bayesian approach to estimating nonlinear mixed-effects mixture models. *Structural Equation Modeling*, 22(2), 202–215. <https://doi.org/10.1080/10705511.2014.937322>

56. Yuan, K.-H., \*Tong, X., & Zhang, Z. (2015). Bias and efficiency for SEM with missing data and auxiliary variables: Two-stage robust method versus two-stage ML. *Structural Equation Modeling*, 22(2), 178–192. <https://doi.org/10.1080/10705511.2014.935750>
57. Bernard, K., Peloso, E., Laurenceau, J-P, Zhang, Z., & Dozier, M. (2015). Examining change in cortisol patterns during the 10-week transition to a new childcare setting. *Child Development*, 86(2), 456–71. <https://doi.org/10.1111/cdev.12304>
58. Merluzzi, T.V., Philip, E.J., Zhang, Z., & Sullivan, C. (2015). Perceived discrimination, coping, and quality of life for African-American and Caucasian persons with cancer. *Cultural Diversity and Ethnic Minority Psychology*, 21(3), 337–344. <https://doi.org/10.1037/a0037543>
59. Zhang, Z., Hamagami, F., Grimm, K. J., & McArdle, J. J. (2015). Using R package RAMpath for tracing SEM path diagrams and conducting complex longitudinal data analysis. *Structural Equation Modeling*, 22(1), 132–147. <https://doi.org/10.1080/10705511.2014.935257>
60. Hardy, S. A., Zhang, Z., Skalski, J. E., Melling, B. S., & Brinton, C. T. (2014). Daily religious involvement, spirituality, and moral emotions. *Psychology of Religion and Spirituality*, 6(4), 338–348. <http://doi.org/10.1037/a0037293>
61. \*Tong, X., Zhang, Z., & Yuan, K.-H. (2014). Evaluation of test statistics for robust structural equation modeling with nonnormal missing data. *Structural Equation Modeling*, 21, 553–565. <https://doi.org/10.1080/10705511.2014.919820>
62. Zhang, Z. (2014a). WebBUGS: Conducting Bayesian analysis online. *Journal of Statistical Software*, 61(7), 1–30. <http://doi.org/10.18637/jss.v061.i07>
63. Zhang, Z. (2014b). Monte Carlo based statistical power analysis for mediation models: Methods and software. *Behavior Research Methods*, 46(4), 1184–1198. <https://doi.org/10.3758/s13428-013-0424-0>
64. Song, H., & Zhang, Z. (2014). Analyzing multiple multivariate time series data using multilevel dynamic factor models. *Multivariate Behavioral Research*, 49(1), 67–77. <https://doi.org/10.1080/00273171.2013.851018>
65. \*Lu, Z., & Zhang, Z. (2014). Robust growth mixture models with non-ignorable missingness: Models, estimation, selection, and application. *Computational Statistics and Data Analysis*, 71, 220–240. <https://doi.org/10.1016/j.csda.2013.07.036>
66. \*Tong, X., & Zhang, Z. (2014). Abstract: Semiparametric Bayesian modeling with application in growth curve analysis. *Multivariate Behavioral Research*, 49, 299–299. <https://doi.org/10.1080/00273171.2014.912928>
67. Zhang, Z. (2013). Bayesian growth curve models with the generalized error distribution. *Journal of Applied Statistics*, 40(8), 1779–1795. <https://doi.org/10.1080/02664763.2013.796348>
68. Grimm, K. J., Kuhl, A. P., & Zhang, Z. (2013). Measurement models, estimation, and the study of change. *Structural Equation Modeling*, 20(3), 504–517, DOI: <http://doi.org/10.1080/10705511.2013.797837>
69. Philip, E. J., Merluzzi, T. V., Zhang, Z. & Heitzmann, C. (2013). Depression and cancer survivorship: Importance of coping self-efficacy in post-treatment survivors. *Psycho-Oncology*, 22(5), 987–994. <https://doi.org/10.1002/pon.3088>
70. Grimm, K. J., Zhang, Z., Hamagami, F., & Mazzocco, M. (2013). Modeling nonlinear change via latent change and latent acceleration frameworks: Examining velocity and

- acceleration of growth trajectories. *Multivariate Behavioral Research*, 48, 117–143.  
<https://doi.org/10.1080/00273171.2012.755111>
71. Zhang, Z., \*Lai, K., \*Lu, Z., & \*Tong, X. (2013). Bayesian inference and application of robust growth curve models using Student's t distribution. *Structural Equation Modeling*, 20(1), 47–78. <https://doi.org/10.1080/10705511.2013.742382>
  72. Zhang, Z., & Wang, L. (2013). Methods for mediation analysis with missing data. *Psychometrika*, 78(1), 154–184. <https://doi.org/10.1007/s11336-012-9301-5>
  73. Yuan, K.-H., & Zhang, Z. (2012). Robust structural equation modeling with missing data and auxiliary variables. *Psychometrika*, 77(4), 803–826.  
<https://doi.org/10.1007/s11336-012-9282-4>
  74. \*Tong, X., and Zhang, Z. (2012). Diagnostics of robust growth curve modeling using Student's t distribution. *Multivariate Behavioral Research*, 47(4), 493–518.  
<https://doi.org/10.1080/00273171.2012.692614>
  75. Yuan, K.-H., & Zhang, Z. (2012). Structural equation modeling diagnostics using R package semdiag and EQS. *Structural Equation Modeling: An Interdisciplinary Journal*, 19(4), 683–702. <https://doi.org/10.1080/10705511.2012.713282>
  76. Zhang, Z., & Wang, L. (2012). A note on the robustness of a full Bayesian method for non-ignorable missing data analysis. *Brazilian Journal of Probability and Statistics*, 26(3), 244–264. <https://doi.org/10.1214/10-BJPS132>
  77. Zhang, Z., McArdle, J. J., & Nesselroade, J. R. (2012). Growth rate models: Emphasizing growth rate analysis through growth curve modeling. *Journal of Applied Statistics*, 39(6), 1241–1262. <https://doi.org/10.1080/02664763.2011.644528>
  78. \*Tong, X., Zhang, Z., & Yuan, K.-H. (2011). Abstract: Evaluation of test statistics for robust structural equation modeling with nonnormal missing data. *Multivariate Behavioral Research*, 46(6), 1016–1016.  
<https://doi.org/10.1080/00273171.2011.636715>
  79. Wang, L. & Zhang, Z. (2011). Estimating and testing mediation effects with censored data. *Structural Equation Modeling*, 18(1), 18–34.  
<http://doi.org/10.1080/10705511.2011.534324>
  80. Hardy, S. A., White, J., Zhang, Z., & Ruchty, J. (2011). Parenting and the socialization of religiousness and spirituality. *Psychology of Religion and Spirituality*, 3(3), 217–230.  
<https://doi.org/10.1037/a0021600>
  81. \*Lu, Z., Zhang, Z., & Lubke, G. (2011). Bayesian inference for growth mixture models with latent class dependent missing data. *Multivariate Behavioral Research*, 46(4), 567–597. <https://doi.org/10.1080/00273171.2011.589261>
  82. Zhang, Z., Browne, M. W., & Nesselroade, J. R. (2011). Higher-order factor invariance and idiographic mapping of constructs to observables. *Applied Developmental Sciences*, 15(4), 186–200. <https://doi.org/10.1080/10888691.2011.618099>
  83. \*Lu, Z., Zhang, Z., & Lubke, G. (2010). Abstract: Bayesian inference for growth mixture models with non-ignorable missing data. *Multivariate Behavioral Research*, 45(6), 1028–1028. <https://doi.org/10.1080/00273171.2010.534381>
  84. Winter, W. C., Hammond, W. R., Zhang, Z., & Green, N. H. (2009). Measuring circadian advantage in Major League Baseball: A 10-year retrospective study. *International Journal of Sports Physiology and Performance*, 4(3) 394–401.  
<https://doi.org/10.1123/ijsp.4.3.394>

85. Hamaker, E. L., Zhang, Z., & van der Maas, H. L. J. (2009). Dyads as dynamic systems: Using threshold autoregressive models to study dyadic interactions. *Psychometrika*, 74(4) 727–745. <https://doi.org/10.1007/s11336-009-9113-4>
86. Zhang, Z., & Wang, L. (2009). Statistical power analysis for growth curve models using SAS. *Behavior Research Methods*, 41(4), 1083–1094. <https://doi.org/10.3758/BRM.41.4.1083>
87. Zhang, Z., Hamaker, E. L., & Nesselroade, J. R. (2008). Comparisons of four methods for estimating dynamic factor models. *Structural Equation Modeling*, 15(3), 377–402. <https://doi.org/10.1080/10705510802154281>
88. Zhang, Z., McArdle, J. J., Wang, L., & Hamagami, F. (2008). A SAS interface for Bayesian analysis with WinBUGS. *Structural Equation Modeling*, 15(4), 705–728. <https://doi.org/10.1080/10705510802339106>
89. Wang, L., Zhang, Z., McArdle, J. J., & Salthouse, T. A. (2008). Investigating ceiling effects in longitudinal data analysis. *Multivariate Behavioral Research*, 43(3), 476–496. <https://doi.org/10.1080/00273170802285941>
90. Zhang, Z., Davis, H. P., Salthouse, T. A., & Tucker-Drob, E. A. (2007). Correlates of individual, and age-related, differences in short-term learning. *Learning and Individual Differences*, 17(3), 231–240. <https://doi.org/10.1016/j.lindif.2007.01.004>
91. Zhang, Z., Hamagami, F., Wang, L., Grimm, K. J., & Nesselroade, J. R. (2007). Bayesian analysis of longitudinal data using growth curve models. *International Journal of Behavioral Development*, 31(4), 374–383. <https://doi.org/10.1177/0165025407077764>
92. Zhang, Z., & Nesselroade J. R. (2007). Bayesian estimation of categorical dynamic factor models. *Multivariate Behavioral Research*, 42(4), 729–756. <https://doi.org/10.1080/00273170701715998>

### **Books and Monographs**

93. Jacobucci, R., Grimm, K. J., & Zhang, Z. (2023). *Exploratory data mining for social and behavioral scientists*. New York, NY: Guilford.
94. Zhang, Z., Yuan, K.-H., Wen, Y., & Tang, J. (Eds.). (2020). *New developments in data science and data analytics: Proceedings of the 2019 meeting of the International Society for Data Science and Analytics*. Granger, IN: ISDSA Press. <https://doi.org/10.35566/isdsa2019>. To order: <https://www.amazon.com/gp/product/1946728039>
95. Zhang, Z., & Yuan, K.-H. (Eds.). (2018). *Practical statistical power analysis using Webpower and R*. Granger, IN: ISDSA Press. To order: <https://www.amazon.com/gp/product/1946728020>. Free E-book: <https://bit.ly/32ybdzQ>
96. Zhang, Z. & Wang, L. (2017). *Advanced statistics using R*. Granger, IN: ISDSA Press. Retrieval from <https://advstats.psychstat.org/>.

### **Refereed Publications in Proceedings and Books**

97. Kovač, N., Farahani, H., Zhang, Z., & Watson, P. (2026). Complex network analysis. In P. Watson, H. Farahani & T. Bezdan (Eds.), *Introduction to Intricate Artificial Psychology with Python* (pp. 135-175). Academic Press. <https://doi.org/10.1016/B978-0-443-30248-0.00011-5>
98. Farahani, H., Kovač, N., Simeunović, M., Watson, P., & Zhang, Z. (2026). Network approach in psychology. In P. Watson, H. Farahani & T. Bezdan (Eds.), *Introduction to*

- Intricate Artificial Psychology with Python* (pp. 135-175). Academic Press. <https://doi.org/10.1016/B978-0-443-30248-0.00016-4>
99. Yuan, K.-H., & Zhang, Z. (2023). Statistical and Psychometric Properties of Three Weighting Schemes of the PLS-SEM Methodology. In Latan, H., Hair, Jr., J.F., Noonan, R. (Eds.), *Partial Least Squares Path Modeling*. Springer, Cham. [https://doi.org/10.1007/978-3-031-37772-3\\_4](https://doi.org/10.1007/978-3-031-37772-3_4)
  100. Yuan, K.-H., & Zhang, Z. (2023). Statistical and Psychometric Properties of Three Weighting Schemes of the PLS-SEM Methodology. In *Partial Least Squares Path Modeling - Basic Concepts, Methodological Issues and Applications*. Springer-Nature.
  101. Lu, Z. L., Zhang, Z. (2022). Pooled Autoregressive Models for Categorical Data. In: Wiberg, M., Molenaar, D., González, J., Kim, JS., Hwang, H. (eds) *Quantitative Psychology. IMPS 2021*. Springer Proceedings in Mathematics & Statistics, vol 393. Springer, Cham. [https://doi.org/10.1007/978-3-031-04572-1\\_14](https://doi.org/10.1007/978-3-031-04572-1_14)
  102. Zhang, Z., Qu, W. (2020). Kurtosis. Dana S. Dunn (Ed.) *Oxford Bibliographies in Psychology*. New York: Oxford University Press.
  103. \*Qu, W. & Zhang, Z. (2020). An application of aspect-based sentiment analysis on teaching evaluation. *New Developments in Data Science and Data Analytics: Proceedings of the 2019 Meeting of the International Society for Data Science and Analytics*. Granger: ISDSA Press.
  104. \*Qu, W., \*Liu, H., & Zhang, Z. (2020). Permutation test of regression coefficients in social network data analysis. *Quantitative Psychology. IMPS 2019. Springer Proceedings in Mathematics & Statistics*, 322. Springer, Cham. DOI:10.1007/978-3-030-43469-4\_28..
  105. Zhang, Z., +Ye, M., +Huang, Y., & +Sun, N. (2018). A longitudinal social network clustering method based on tie strength. *Proceedings of 2018 IEEE international conference on big data* (pp. 1690–1697).
  106. Zhang, Z., & \*Liu, H. (2018). Sample size and measurement occasion planning for latent change score models through Monte Carlo simulation. In E. Ferrer, S. M. Boker, and K. J. Grimm (Eds.), *Advances in longitudinal models for multivariate psychology: A festschrift for Jack McArdle* (pp. 189–211). New York, NY: Routledge.
  107. ^Mai, Y., & Zhang, Z. (2017). Statistical power analysis for comparing means with binary or count data based on analogous ANOVA. In L. A. van der Ark, M. Wiberg, S. A. Culpepper, J. A. Douglas, and W.-C. Wang (Eds.), *Quantitative psychology—The 81st annual meeting of the psychometric society* (pp. 381–393). Springer Proceedings in Mathematics & Statistics. New York, NY: Springer.
  108. \*Du, H., Zhang, Z., & Yuan, K.-H. (2017). Power analysis for t-test with non-normal data and unequal variances. In L. A. van der Ark, M. Wiberg, S. A. Culpepper, J. A. Douglas, and W.-C. Wang (Eds.), *Quantitative psychology—The 81st annual meeting of the psychometric society* (pp. 373–380). Springer Proceedings in Mathematics & Statistics. New York, NY: Springer.
  109. Zhang, Z., Wang, L., & \*Tong, X. (2015). Mediation analysis with missing data through multiple imputation and bootstrap. In L. A. van der Ark, D. M. Bolt, W.-C. Wang, J. A. Douglas, & S.-M. Chow (Eds.), *Quantitative psychology research—The 79th annual meeting of the psychometric society* (pp. 341–355). Springer Proceedings in Mathematics & Statistics. New York, NY: Springer.

110. \*Lu, Z., & Zhang, Z. (2015). Issues in aggregating time series: Illustration through an AR(1) model. . In L. A. van der Ark, D. M. Bolt, W.-C. Wang, J. A. Douglas, & S.-M. Chow (Eds.), *Quantitative psychology research—The 79th annual meeting of the psychometric society* (pp. 357–370). Springer Proceedings in Mathematics & Statistics. New York, NY: Springer.
111. \*Lu, Z., Zhang, Z., & Cohen, A. (2015). Model selection criteria for latent growth models using Bayesian methods. In R. E. Millsap, D. M. Bolt, L. A. van der Ark, & W.-C. Wang (Eds.), *Quantitative psychology research—The 78th annual meeting of the psychometric society* (pp. 319–341). Springer Proceedings in Mathematics & Statistics. New York, NY: Springer.
112. \*Lu, Z., Zhang, Z., & Cohen, A. (2013). Bayesian methods and model selection for latent growth curve models with missing data. In R. E. Millsap, L. A. van der Ark, D. M. Bolt, & C. M. Woods (Eds.), *New developments in quantitative psychology* (pp. 275–304). Springer Proceedings in Mathematics & Statistics. New York, NY: Springer.
113. Hamagami, F., Zhang, Z., & McArdle, J. J. (2009). Modeling latent difference score models using Bayesian algorithms. In S.-M. Chow, E. Ferrer, & F. Hsieh (Eds.), *Statistical methods for modeling human dynamics: An interdisciplinary dialogue* (pp. 319–348). New York, NY: Lawrence Erlbaum Associates.
114. Wang, L., Zhang, Z., & Estabrook, R. (2009). Longitudinal mediation analysis of training intervention effects. In S.-M. Chow, E. Ferrer, & F. Hsieh (Eds.), *Statistical methods for modeling human dynamics: An interdisciplinary dialogue* (pp. 349–380). New York, NY: Lawrence Erlbaum Associates.
115. Zhang, Z., & Wang, L. (2008). Methods for evaluating mediation effects: Rationale and comparison. In K. Shigemasu, A. Okada, T. Imaizumi, & T. Hoshino (Eds.), *New trends in psychometrics* (pp. 585–594). Tokyo: Universal Academy Press.

### Encyclopedia Entries

116. \*Liu, H., & Zhang, Z. (2018). Probit transformation. *The SAGE encyclopedia of educational research, measurement, and evaluation* (p. 1300). Thousand Oaks, CA: Sage.
117. Zhang, Z. (2018). Moments of a Distribution. *The SAGE encyclopedia of educational research, measurement, and evaluation* (p. 1084–1085). Thousand Oaks, CA: Sage.
118. \*Cain, M., & Zhang, Z. (2018). Posterior. *The SAGE encyclopedia of educational research, measurement, and evaluation* (p. 1274–1275). Thousand Oaks, CA: Sage.

### Book Review

119. Zhang, Z. (2018). Psychometrics from a Bayesian perspective: A review of Bayesian Psychometric Modeling (Levy & Mislevy, 2016). *Journal of Educational and Behavioral Statistics*, 43(4), 502–505. <https://doi.org/10.3102/1076998618778011>

### Software Development

120. +Xu, J., Zhang, Z., & \*Qu, W. (2018). webnetvis: Interactive network visualization online [Computer software]. Retrieved from <https://webnetvis.psychstat.org>.
121. \*Wen, Q., \*Liu, H., & Zhang, Z. (2018). mnormr: An R package for multivariate non-normal data generation [Computer software]. Retrieved from <https://cran.r-project.org/package=mnormt>.

122. Zhang, Z., & ^Keenan, A. (2017). WebPower: An Android app for statistical power analysis [Computer software]. Retrieved from <https://play.google.com/store/apps/details?id=org.psychstat.webpower>.
123. Zhang, Z., Yuan, K.-H., & ^Mai, Y. (2018). WebPower: An R package for statistical power analysis [Computer software]. Retrieved from <https://CRAN.R-project.org/package=WebPower>. (*Installed more than 3,000 times from May 2018 to May 2019*)
124. Zhang, Z., Yuan, K.-H., & \*Cain, M. (2016). Software for estimating univariate and multivariate skewness and kurtosis [Computer software]. Retrieved from <http://psychstat.org/nonnormal>.
125. \*Ke, Z., & Zhang, Z. (2016). pautocorr: Testing autocorrelation and partial autocorrelation through bootstrap and surrogate methods [Computer software]. Retrieved from <https://r-forge.r-project.org>.
126. \*Liu, H., & Zhang, Z. (2016). logistic4p: Logistic regression with misclassification in dependent variables [Computer software]. Retrieved from <https://r-forge.r-project.org>.
127. ^Mai, Y., Zhang, Z., & Yuan, K.-H. (2015). An online interface for drawing path diagrams for structural equation modeling [Computer software]. Retrieved from <http://semdiag.psychstat.org>.
128. Zhang, Z., Yuan, K.-H., & ^Mai, Y. (2015-2018). WebPower: Statistical power analysis online [Computer software]. Retrieved from <http://webpower.psychstat.org>.
129. Zhang, Z., & Yuan, K.-H. (2015). coefficientalpha: Robust Cronbach's alpha and McDonald's omega for non-normal and missing data [Computer software]. Retrieved from <https://CRAN.R-project.org/package=coefficientalpha>.
130. Zhang, Z. (2014-2018). WebBUGS: Conducting Bayesian analysis online [Computer software]. Retrieved from <http://webbugs.psychstat.org>.
131. Zhang, Z., Jiang, J., & Liu, H. (2013). An online software for meta-analysis of correlation [Computer software]. Retrieved from <http://webbugs.psychstat.org/modules/metacorr/>.
132. Zhang, Z., McArdle, J. J., Hamagami, F., & Grimm, K. J. (2013). RAMpath: Structural equation modeling using RAM notation [Computer software]. Retrieved from <https://CRAN.R-project.org/package=RAMpath>.
133. Zhang, Z. & Yuan, K.-H. (2012-2018). WebSEM: Conducting SEM analysis online [Computer software]. Retrieved from <https://websem.psychstat.org>.
134. Yuan, K.-H. & Zhang, Z. (2011). rsem: An R package for robust structural equation modeling with non-normal and missing data [Computer software]. Retrieved from <https://CRAN.R-project.org/package=rsem>.
135. Zhang, Z. & Yuan, K.-H. (2011). semdiag: An R package for structural equation modeling diagnostics [Computer software]. Retrieval from <https://CRAN.R-project.org/package=semdiag>.
136. Zhang, Z., & Wang, L. (2011). bmem: An R packages for mediation analysis with ignorable and non-ignorable missing data [Computer software]. Retrieved from <https://CRAN.R-project.org/package=bmem>.
137. Zhang, Z., & Wang, L. (2009). SAS macros for power analysis of growth curve models [Computer software]. Retrieval from <http://saspower.psychstat.org>.

138. Zhang, Z., & Wang, L. (2008). BAUW as an OpenBUGS plugin [Computer software]. Retrieval from <http://bauw.psychstat.org>.
139. Zhang, Z., McArdle, J. J., Wang, L., & Hamagami, F. (2008). SAS scripts for Bayesian analysis with WinBUGS [Computer software]. Retrieved from <http://www.psychstat.org/us/sort.php/25.htm>.
140. Zhang, Z., & Wang, L. (2007). MedCI: Mediation confidence intervals [Computer software]. Retrieved from <http://www.psychstat.org/us/sort.php/31.htm>.
141. Zhang, Z., & Wang, L. (2006). BAUW: Bayesian analysis using WinBUGS [Computer software]. Retrieved from <http://bauw.psychstat.org>.
142. Zhang, Z. (2006). LDSM: A C++ program for generating codes for analyzing latent difference score model in Mplus [Computer software]. Retrieved from <http://www.psychstat.org/us/article.php/38>.
143. Zhang, Z., & Nesselroade, J. R. (2005). Selection: A C++ program for analyzing selection effects [Computer software]. Retrieved from <http://www.psychstat.org/us/article.php/64>.
144. Zhang, Z., & Nesselroade, J. R. (2004). DFA: Dynamic factor analysis [Computer software]. Retrieved from <http://dfa.psychstat.org>.

### **Invited Lectures and Addresses**

1. Zhang, Z. (2025, May). Utilizing Social Network Data in Psychological and Educational Research. Invited talk at the East China Normal University, Shanghai, China.
2. Zhang, Z. (2024, July). Introduction to an online app for SEM analysis with text data. Invited talk at the 2024 Annual Meeting of ISDSA, Vienna, Austria.
3. Zhang, Z. (2024, June). Structural Equation Modeling with Network Data. Invited talk at the 2024 ICSA Applied Statistics Symposium, Nashville, TN.
4. Zhang, Z. (2024, June). A Two-Stage Method to Utilize Text Information in Structural Equation Modeling. Invited talk at the Beijing Normal University, Beijing, China.
5. Zhang, Z. (2024, May 17). Structural Equation Modeling with Text Data. Invited talk at the Nanjing University of Posts and Telecommunications, Nanjing, China.
6. Zhang, Z. (2024, May 15). Prevalence, Influences, and Handling Methods of Non-normal Data. Invited talk at the Tsinghua University, Beijing, China.
7. Zhang, Z. (2023, July). Social Network Analysis in the Framework of Structural Equation Modeling. Invited talk at the Nanjing University of Posts and Telecommunications, Nanjing, China.
8. Zhang, Z. (2023, July). Statistical power for linear and quadratic growth curve models with ignorable and non-ignorable missing data. Invited talk at the 2023 Annual Meeting of ISDSA, Shanghai, China.
9. Zhang, Z. (2022, August, Chair). *Methods and Applications of Network Science in Psychology*. Invited symposium conducted at the 2022 Annual Convention of the American Psychological Association, Minneapolis, MN.
10. Zhang, Z. (2022, April). *Prevalence, Influences, and Handling Methods of Non-normal Data*. Invited talk at the University of Southern California
11. Zhang, Z. (2021, November). *Social Network Analysis In The Framework Of Structural Equation Modeling*. Invited talk by Data Analytics Colloquium. <https://dacolloquium.com>

12. Zhang, Z. (2021, November). *What is Data Science?* Invited talk by Data Science Forum.
13. Zhang, Z. (2020, November). *Quantitative Psychology at the Age of Data Science*. Presented to the Monday Symposium in Measurement and Statistics at University Of Maryland & the Brownbag Series of the Quantitative Psychology Program at The Ohio State University. (Online)
14. Zhang, Z. (2020, July). *Psychometric Models for Social Network Data Analysis*. Invited talk at the 85th Annual Meeting of Psychometric Society. (Online)
15. Zhang, Z. (2019, October). *Measure changes in networks*. Cattell Award address at the Annual Meeting of the Society of Multivariate Experimental Research, Baltimore, MA.
16. Zhang, Z. (2019, August). *A comparison of machine learning methods for understanding teaching evaluation comments*. Invited talk at the 2019 Global Summit on Artificial Intelligence and Big Data in Education, Beijing, China.
17. Zhang, Z. & Liu, H. (2019, July). *Social Network Analysis in the Structural Equation Modeling Framework*. Invited talk at the Yangtze Normal University, Chongqing, China.
18. Zhang, Z. & Liu, H. (2019, July). *A Structural Equation Modeling Framework for Social Network Analysis*. Invited talk at the University of Science and Technology of China, Hefei, China.
19. Zhang, Z. (2019, July). *Improving teaching evaluation using text mining*. Invited talk at the 2019 Meeting of the International Society for Data Science and Analytics, Nanjing, China.
20. Zhang, Z. (2019, March). *Stones from one hill may serve to polish the jade of another: Bridging quantitative psychology and data science*. Invited talk at the Pennsylvania State University, University Park, PA.
21. Zhang, Z. (2018, July). *A blessing or a curse? An overview of non-normal data and missing data*. Invited talk at the 2018 International Conference on Management and Operations Research, Beijing, China. [Invited keynote]
22. Zhang, Z., <sup>+</sup>Ye, M., <sup>+</sup>Huang, Y., & <sup>+</sup>Sun, N. (2018, July). *A longitudinal social network clustering method based on tie strength*. Invited talk at the 8th International Forum on Statistics, Beijing, China.
23. Zhang, Z. (2017, June). *Modeling non-normal distributions in mixed-effects and multilevel models*. Invited talk at the 2017 ICSA Applied Statistics Symposium, Chicago, IL.
24. Zhang, Z. (2017, May). *Statistical methods and software for handling non-normal data in social, behavioral and economic sciences*. Invited talk at Henan University, Kaifeng, China.
25. Zhang, Z. (2017, March). *Two-stage Bayesian estimation in structural equation modeling*. Invited talk at the ACMS Statistics Seminar, Department of ACMS, University of Notre Dame, Notre Dame, IN.
26. Zhang, Z., & \*Liu, H. (2016, October). *Sample size planning for latent change score models through Monte Carlo simulation*. Invited talk at the Conference on Advances in Longitudinal Models for Multivariate Psychology: A Festschrift for Jack McArdle, Richmond, VA.

27. Zhang, Z., & Yuan, K.-H. (2015, December). *Online statistical software for simple and complex models*. Invited software demonstration/tutorial at the IES PI meeting, Washington, D.C.
28. Zhang, Z. (2015, June). *Statistical power analysis for mediation effects through WebPower*. Invited talk at the Renmin University of China, Beijing, China.
29. Zhang, Z. (2015, March). *Bayesian factor analysis*. Invited talk at the University of Southern California, Los Angeles, CA.
30. Zhang, Z. (2014, September). *The use of relaxed and Bayesian assumptions on error terms in dynamic models of change*. Invited talk at the 2014 Society for Research in Child Development themed meeting: Developmental Methodology, San Diego, CA.
31. Yuan, K.-H., \*Tong, X., & Zhang, Z. (2012, July). *Bias and efficiency for SEM with missing data and auxiliary variables: Robust method versus normal distribution based ML*. Invited talk at the 2nd meeting of the Institute of Mathematical Statistics Asia Pacific Rim, Tsukuba, Japan.
32. \*Lu, Z., Zhang, Z., & Lubke, G. (2012, January). *Bayesian inference for growth mixture models with latent class dependent missing data*. Invited talk at the Hong Kong Institute of Education, Hong Kong, China.
33. Zhang, Z. (2011, June). *Introduction to Bayesian analysis*. Invited lecture at the Renmin University of China, Beijing, China.
34. Zhang, Z., McArdle, J. J., & Nesselroade, J. R. (2011, May). *Growth rate models: Emphasizing growth rate analysis through growth curve modeling*. Invited talk at the Nesselroade Festschrift, Charlottesville, VA
35. Zhang, Z. (2009, July). *Bayesian analysis*. Invited workshop at the University of Southern California, Los Angeles, CA.

## **Conference Presentations**

### Organized Meetings

36. Zhang, Z., & Yuan, K.-H. (2024, July). *The 2024 ISDSA Meeting on Behavioral Data Science*. Vienna, Austria.
37. Zhang, Z., & Yuan, K.-H. (2023, July). *The 2023 ISDSA Meeting on Behavioral Data Science*. Shanghai, China.
38. Zhang, Z., & Yuan, K.-H. (2022, May). *The 2022 ISDSA Meeting on Behavioral Data Science*. Notre Dame, IN.
39. Zhang, Z., & Yuan, K.-H. (2021, June). *The 2021 ISDSA Meeting on Behavioral Data Science*. Notre Dame, IN. (Online)
40. Zhang, Z., & Yuan, K.-H. (2020, May). *The 2020 Annual Meeting of the International Society for Data Science and Analytics*. Notre Dame, IN. (Online)
41. Zhang, Z., & Yuan, K.-H. (2019, July). *The 2019 Annual Meeting of the International Society for Data Science and Analytics*. Nanjing, China.
42. Yuan, K.-H., & Zhang, Z. (2017, May). *Statistics in social sciences: Present and future*. Beijing, China.

### Chaired Symposia

43. Zhang, Z. (2025, August). *Structural Equation Models with Social Network Data*. Symposium at the 2025 Annual Convention of APA, Denver, CO.

44. Zhang, Z. (2024, August). New statistical methods for variable selection and text data analysis. Symposium conducted at the 2024 Annual Convention of the American Psychological Association, Seattle, WA.
45. Zhang, Z. (2024, July). New insights in longitudinal data and mediation analysis. Symposium organized at the IMPS 2024 Annual Meeting, Prague, Czech.
46. Zhang, Z., & Yuan, K.-H. (2015, May, Chaired Symposiums). *Methods and software for statistical power analysis with non-normal data*. Symposium conducted at the 27th Annual Convention of the Association for Psychological Science, New York, NY.
47. Zhang, Z. (2014, May). *New developments in Bayesian analysis*. Symposium conducted at the 26th Annual Convention of the Association for Psychological Science, San Francisco, CA.
48. Zhang, Z., & Yuan, K.-H. (2012, May). *Robust statistical data analysis*. Symposium conducted at the 24th Annual Convention of the Association for Psychological Science, Chicago, IL.
49. Zhang, Z. (2011, August). *Bayesian methods for non-normal and non-ignorable missing data analysis*. Symposium conducted at the 119th Annual Convention of the American Psychological Association, Washington DC.

#### Workshops

50. Zhang, Z. (2025, July). Invited workshop on *Structural Equation Models with Social Network Data* at the 2025 ISDSA Annual Meeting. Washington, DC.
51. Zhang, Z. (2023, July). Invited workshop on *Deep Learning Using R* at the 2023 ISDSA Annual Meeting. Online.
52. Du, H. & Zhang, Z. (2023, May). *Power Analysis*. Invited workshop conducted at the 2023 Annual Convention of Association for Psychological Science, Washington DC.
53. Tong, X., Du, H., & Zhang, Z. (2022, June). Workshop on *Bayesian Longitudinal Data Modeling*. Two-day workshop supported by the Association of Psychological Science.
54. Zhang, Z. (2022, June). *Workshop on Statistical Power Analysis for Structural Equation Modeling* at the 2022 ISDSA Annual Meeting. Online.
55. Zhang, Z. (2021, June). *Workshop on Statistical Power analysis* at the 2021 ISDSA Annual Meeting. Online.
56. Zhang, Z. (2019, July). *Data mining methods for education and psychology*. Workshop conducted at the 2019 Global Summit on Artificial Intelligence and Big Data in Education, Beijing, China.
57. Zhang, Z. (2016, August). *Practical statistical power analysis for simple and complex models*. Workshop conducted at the 124th Annual Convention of the American Psychological Association, Denver, CO.
58. Zhang, Z., & Yuan K.-H. (2013, August). *Robust SEM for non-normal and missing data using WebSEM*. Workshop conducted at the 121th Annual Convention of the American Psychological Association, Washington DC.
59. Zhang, Z. (2009, August). *Introduction to Bayesian analysis*. Workshop presented at the 117th Annual Convention of the American Psychological Association, Toronto, Canada.

#### Paper Presentations

60. Zhang, Z. (2024, August). Factor analysis with text data through Universal Sentence Encoder. Paper presented at the 2024 Annual Convention of the American Psychological Association, Seattle, WA.
61. Zhang, Z. (2024, July). Mediation Analysis with Text Data. Paper presented at the IMPS 2024 Annual Meeting, Prague, Czech.
62. Zhang, Z. (2023, October). WebPower as an open system for statistical power analysis. Online presentation at the 2023 SMEP Meeting.
63. +Wyman, A., & Zhang, Z. (2022, October). API Face Value: Enhancing Emotional Deficit Interventions with Emotion Detection Software. Presented at the ninety-third annual conference of the Indiana Association of the Social Sciences, Gary, IN, United States.
64. \*Xu, Z., \*Hai, J., \*Yang, Y., & Zhang, Z. (May, 2022). *Comparison of Methods for Imputing Social Network Data*. Paper presented at the 2022 Annual Convention of the American Psychological Association, Minneapolis, MN.
65. \*Xu, Z., \*Hai, J., \*Yang, Y., & Zhang, Z. (May, 2022). *Comparison of Methods for Imputing Social Network Data*. Paper presented at the 2022 Annual Meeting of the International Society for Data Science and Analytics, Notre Dame, IN, USA.
66. Zhang, Z. (May, 2022). *Social Network Analysis in the Framework of Structural Equation Modeling*. Paper presented at the 2022 Annual Meeting of the International Society for Data Science and Analytics, Notre Dame, IN, USA.
67. \*Wilcox, K. T., Jacobucci, R., and Zhang, Z. (2020, July). *Combining topic modeling and regression: Supervised topic modeling with covariates*. Paper presented at the 85th Annual Meeting of Psychometric Society. (Online)
68. \*Qu, W. & Zhang, Z. (2020, July). *Evaluating the effect of multivariate non-normality on confirmatory factor analysis*. Paper presented at the 85th Annual Meeting of Psychometric Society. (Online)
69. \*Qu, W., Liu, H., & Zhang, Z. (2019, July). *Permutation Test on Logistic Regression Coefficients with Social Network Data*. Paper presented at the 85th Annual Meeting of Psychometric Society. Santiago, Chile.
70. \*Qu, W., & Zhang, Z. (2019, July). *An Application of Aspect-Based Sentiment Analysis on Teaching Evaluation*. Paper presented at the 2019 Annual Meeting of the International Society for Data Science and Analytics. Nanjing, China.
71. Zhang, Z., +Ye, M., +Huang, Y., & +Sun, N. (2018, December). *A longitudinal social network clustering method based on tie strength*. Paper presented at the 2018 IEEE Big Data Conference, Seattle, WA.
72. \*Qu, W., \*Liu, H., & Zhang, Z. (2018, July). *Generation of multivariate non-normal random numbers with specified multivariate measures*. Paper presented at the 2008 International Meeting of the Psychometric Society, New York, NY.
73. Zhang, Z. (2017, Oct). *Two-stage Bayesian estimation in structural equation modeling*. Paper presented at the 2017 meeting of the Society of Multivariate Experimental Psychology, Minneapolis, MN.
74. \*Liu, H., & Zhang, Z. (2016, July). *Logistic regression with misclassification in binary outcome variables: Method and software*. Paper presented at the Annual Meeting of the Psychometric Society, Asheville, NC.

75. Zhang, Z. (2016, July). *Statistical power analysis for mediation with non-normal and missing data*. Paper presented at the Annual Meeting of the Psychometric Society, Asheville, NC.
76. \*Cain, M. K., & Zhang, Z. (2016, May). *Time and other considerations in mediation design*. Paper presented at the 2017 Modern Modeling Methods Conference, Storrs, CT.
77. Zhang, Z. (2014, May). *Monte Carlo based statistical power analysis for mediation analysis with non-normal data: Methods and software*. Paper presented at the 27th Annual Convention of the Association for Psychological Science, New York, NY.
78. \*Lu, Z., & Zhang, Z. (2014, July). *Aggregating time series: Illustration through an AR(1) model*. Paper presented at the 79th Annual Meeting of the Psychometric Society, Madison, Wisconsin.
79. Zhang, Z., Wang, L., & \*Tong, X. (2014, July). *Mediation analysis with missing data through multiple imputation and bootstrap*. Paper presented at the 79th Annual Meeting of the Psychometric Society, Madison, Wisconsin.
80. \*Liu, H., & Zhang, Z. (2014, July). *Separating-strategy priors for covariance matrices*. Paper presented at the 79th Annual Meeting of the Psychometric Society, Madison, Wisconsin.
81. \*Lu, Z., Zhang, Z., & Cohen, A. (2014, May). *Bayesian model selection criteria for latent growth models*. Paper presented at the 26th Annual Convention of the Association for Psychological Science, San Francisco, CA.
82. \*Tong, X., & Zhang, Z. (2014, May). *Robust semi-parametric Bayesian methods in growth curve modeling with nonnormal data*. Paper presented at the 26th Annual Convention of the Association for Psychological Science, San Francisco, CA.
83. Zhang, Z., Jiang, K., & \*Liu, H. (2014, May). *Bayesian meta-analysis of correlation coefficients through power prior*. Paper presented at the 26th Annual Convention of the Association for Psychological Science, San Francisco, CA.
84. \*Lu, Z., & Zhang, Z. (2014, April). *Robust growth mixture models with non-ignorable missingness*. Paper presented at the 2014 Annual Meeting of National Council on Measurement in Education, Philadelphia, Pennsylvania.
85. Liu, X., Liu, F., Simon, M., & Zhang, Z. (2014, April). *Are the score gains suspicious? – A Bayesian growth analysis approach*. Paper presented at the 2014 Annual Meeting of National Council on Measurement in Education, Philadelphia, Pennsylvania.
86. Zhang, Z., & Grimm, K. J. (2013, April). *A random-coefficient latent change score model for nonlinear growth data*. Paper presented at the 2013 Biennial Meeting of Society for Research in Child Development, Seattle, Washington.
87. Zhang, Z., \*Lai, K., \*Lu, Z., & \*Tong, X. (2012, May). *Bayesian robust growth curve modeling based on Student's t distribution*. Paper presented at the 24th Annual Convention of the Association for Psychological Science, Chicago IL.
88. Yuan, K.-H., & Zhang, Z. (2012, May). *Robust structural equation modeling with missing data and auxiliary variables*. Paper presented at the 24th Annual Convention of the Association for Psychological Science, Chicago IL.
89. \*Tong, X., Zhang, Z., & Yuan, K.-H. (2012, May). *Evaluation of fit statistics for robust SEM with non-normal missing data*. Paper presented at the 24th Annual Convention of the Association for Psychological Science, Chicago IL.

90. \*Lu, Z., & Zhang, Z. (2012, May). *Robust growth mixture modeling using Bayesian methods*. Paper presented at the 24th Annual Convention of the Association for Psychological Science, Chicago IL.
91. \*Lu, Z., Zhang, Z., & Cohen, A. (2012, July). *Latent growth curve models with non-ignorable missing data: Bayesian inference and model selection criteria*. Paper presented at the 77th Annual International Meeting of the Psychometric Society, Lincoln, Nebraska.
92. Zhang, Z. & \*Lu, Z. (2012, February). *Issues in aggregating time series: Illustration through an AR(1) model*. Paper presented at the 2012 Society for Research in Child Development Themed Meeting: Developmental Methodology, Tampa, Florida.
93. \*Lu, Z., Zhang, Z., & Cohen, A. (2012, April). *Latent growth curve models with non-ignorable missing data: Bayesian inference and model selection criteria*. Paper presented at the 2012 Annual Meeting of the National Council on Measurement in Education (NCME), Vancouver, BC, Canada.
94. \*Xin, T., Zhang, Z., & Yuan, K.-H. (2011). *Evaluation of test statistics for robust structural equation modeling with non-normal missing data*. Paper presented at the Annual Society of Multivariate Experimental Psychology Graduate Student Pre-conference, Oklahoma.
95. Zhang, Z., & Wang, L. (2011, August). *Overview of full Bayesian analysis of non-ignorable missing data*. Paper presented at the 119th Annual Convention of the American Psychological Association, Washington DC.
96. \*Lu, Z., Zhang, Z., & Lubke, G. (2011, August). *Bayesian inference for growth mixture models with non-ignorable missing data*. Paper presented at the 119th Annual Convention of the American Psychological Association, Washington DC.
97. Wang, L. & Zhang, Z. (2011, August). *Bayesian estimation and inference on mediation effects with censored data*. Paper presented at the 119th Annual Convention of the American Psychological Association, Washington DC.
98. \*Tong, X., & Zhang, Z. (2011, August). *Bayesian inference for robust growth curve modeling using  $t$  distributions*. Paper presented at the 119th Annual Convention of the American Psychological Association, Washington DC.
99. \*Lu, Z., Zhang, Z., & Lubke, G. (2011, July) *Bayesian inference for growth mixture models with latent class dependent missing data*. Paper presented at the 76th Annual International Meeting of the Psychometric Society, Hong Kong, China.
100. \*Lu, Z., Zhang, Z., & Lubke, G. (2010, September) *Bayesian inference for growth mixture models with non-ignorable missing data*. Paper presented at the Annual Society of Multivariate Experimental Psychology Graduate Student Pre-conference, Atlanta, GA.
101. Zhang, Z. (2010, July). *Testing the invariance of latent traits in multiple group analysis*. Paper presented at the 7th Conference of the International Test Commission, Hong Kong, China.
102. Zhang, Z. (2009, June). *Bayesian SEM: Current developments and future directions*. Paper presented at the 21th Annual Convention of the Association for Psychological Science, San Francisco, CA.
103. Zhang, Z. (2007, October). *Bootstrap analysis of mediation effects*. Paper presented at the Annual Society of Multivariate Experimental Psychology Graduate Student Pre-conference, Chapel Hill, NC.

104. Zhang, Z., & Wang, L. (2007, July). *Methods evaluating mediation effect: Rationale and comparison*. Paper presented at the 72nd Annual Meeting of the Psychometric Society, Tokyo, Japan.
105. Wang, L., Zhang, Z., & McArdle, J. J. (2006, June). *Investigating the ceiling effects in longitudinal data analysis*. Paper presented at the 71st Annual Meeting of the Psychometric Society, Montreal, Canada.
106. Zhang, Z., Wang, L., & Nesselroade, J. R. (2006, June). *Growth rate models and Bayesian estimation*. Paper presented at the 71st Annual Meeting of the Psychometric Society, Montreal, Canada.

#### Poster Presentations

107. Parra, D., Radvansky, G.A., Zhang, Z. (2024, April). A Meta-Analysis of the Wakeful Rest Effect. The 2024 Midwestern Psychological Association Conference.
108. Zhang, Z. (2018, May). *A new software program for practical statistical power analysis*. Poster presented at the 30th Annual Convention of the Association for Psychological Science, San Francisco, CA.
109. <sup>+</sup>Tzakis, T., \*Liu, H., & Zhang, Z. (2018, May). *A review of social network analysis in psychological research*. Poster presented at the 30th Annual Convention of the Association for Psychological Science, San Francisco, CA.
110. <sup>+</sup>Tzakis, T., & Zhang, Z. (2018, March). *A review of social network analysis in psychological research*. Poster presented at the 2018 Conference of Michigan Academy, Alma, MI.
111. Zhang, Z. (2017, August). *Practical statistical power analysis for multilevel modeling: Methods and software*. Poster presented at the 125th Annual Convention of the American Psychological Association, Washington DC.
112. Zhang, Z., & \*Liu, H. (2017, May). *Sample size planning for latent change score models through Monte Carlo simulation*. Poster presented at the 30th Annual Convention of the Association for Psychological Science, Boston, MA.
113. \*Cain, M. K., & Zhang, Z. (2017, May). *Fit for a Bayesian: An evaluation of PPP and DIC*. Poster presented at the 2017 Modern Modeling Methods Conference, Storrs, CT.
114. ^Mai, Y., & Zhang, Z. (2016, May). *Multilevel modeling through path diagramming: An online graphical interface*. Poster presented at the 28th Annual Convention of the Association for Psychological Science, Chicago, IL.
115. \*Liu, H., & Zhang, Z. (2016, May). *Power of logistic regression with correction of misclassifications*. Poster presented at the 28th APS Annual Convention of Association for Psychological Science, Chicago, IL.
116. \*Liu, H., & Zhang, Z. (2016, May). *Power of logistic regression with correlated predictors*. Poster presented at the 28th APS Annual Convention of Association for Psychological Science, Chicago, IL.
117. Zhang, Z. (2016, October). *Practical statistical power analysis for structural equation modeling: Methods and software*. Poster presented at the 87th Annual Meeting of the Indiana Academy of the Social Sciences, Westville, IN.
118. Zhang, Z., & Wang, L. (2010, August). *Power analysis for linear and nonlinear growth curve modeling*. Poster presented at the 118th Annual Convention of the American Psychological Association, San Diego, CA.

119. Zhang, Z., & Wang, L. (2007, August). Bayesian analysis of longitudinal data using growth curve models. Poster presented at the 115th Annual Convention of the American Psychological Association, San Francisco, CA.
120. Zhang, Z., McArdle, J. J., Wang, L., and Hamagami, F. (2006, August). *Using WinBUGS inside SAS for Bayesian analysis*. Poster presented at the 114th Annual Convention of the American Psychological Association, New Orleans, LA.
121. Wang, L. & Zhang, Z. (2006, April). *Memory training on individual learning performance for independent and vital older adults*. Poster presented at the 19th Cognitive Aging Conference, Atlanta, GA.
122. Zhang, Z., Wang, L., & Hamagami, F. (2006, April). *Evaluation of the intervention of memory training on short-term learning for elderly*. Poster presented at the 19th Cognitive Aging Conference, Atlanta, GA.

## **Teaching and Mentoring**

### Course Taught

- |      |                                                                                                                                       |
|------|---------------------------------------------------------------------------------------------------------------------------------------|
| 2025 | R for Data Science (Spring), Bayesian Statistics (Fall) Advanced Statistics (Fall), Quantitative Study Seminar (Spring, Fall)         |
| 2024 | R for Data Science (Spring, Fall), Advanced Statistics (Fall), Quantitative Study Seminar (Spring, Fall)                              |
| 2023 | R for Data Science (Spring, Fall), Advanced Statistics (Fall), Quantitative Study Seminar (Spring, Fall)                              |
| 2022 | R for Data Science (Spring), Advanced Statistics (Fall), Bayesian Statistics (Fall), Quantitative Study Seminar (Spring, Fall)        |
| 2021 | Advanced Statistics (Fall), Quantitative Study Seminar (Spring, Fall)                                                                 |
| 2020 | R for Data Science (Spring), Advanced Statistics (Fall), Structural Equation Models (Fall), Quantitative Study Seminar (Spring, Fall) |

### Doctoral Dissertations Directed

- |      |                                                                                                                                                                 |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2025 | Lingbo Tong (Tenure-track assistant professor at the University of Wisconsin at Madison)                                                                        |
| 2024 | Sijing Shao (Tenure-track assistant professor at Florida International University, Co-advised with Ross Jacobucci and Guangjian Zhang)                          |
| 2022 | Tyler Wilcox (Statistical Consultant at Cornell University, Co-advised with Lijuan Wang)                                                                        |
| 2021 | Change Che (Now data scientist at Facebook)                                                                                                                     |
| 2021 | Wen Qu (Now associate research professor at the Fudan University)                                                                                               |
| 2018 | Haiyan Liu (Now tenure-track assistant professor at the University of California, Merced)                                                                       |
| 2017 | Megan Cain (Now Senior Statistician at StataCorp, started as a research assistant professor at University of Texas at San Antonio, co-advised with Ke-Hai Yuan) |
| 2014 | Xin Tong (Now tenured associate professor at the University of Virginia)                                                                                        |
| 2011 | Zhenqiu Lu (Now tenured associate professor at the University of Georgia, co-advised with Ke-Hai Yuan)                                                          |

## **Services**

### University and Departmental Service

|              |                                                           |
|--------------|-----------------------------------------------------------|
| 2024–2025    | Research IT Stewardship Committee                         |
| 2019–2023    | Graduate Studies Committee                                |
| 2018–2021    | University Committee on Research and Sponsored Programs   |
| 2017–Current | Psychology Department Communication and Website Committee |
| 2017–Current | Department Committee on Appointment and Promotion         |
| 2008–Current | Psychology Department Computer/Tech Support Committee     |
| 2015         | Review Committee of the Bernoulli awards                  |
| 2015         | ISLA Bi-Annual Large Grant Review Committee               |

## Professional Service

### *Editor*

Journal of Behavioral Data Science, 2021–

### *Associate Editor*

Multivariate Behavioral Research, 2016–2025

Neurocomputing (Editorial Board), 2020–Current

### *Guest Action Editor*

Psychological Methods (2016, 2017)

Sage Open (2017, 2018, 2019)

### *Consulting Editor*

Psychological Methods, 2014–Current

### *Manuscript reviewer*

Abstract and Applied Analysis

Aging, Neuropsychology and Cognition

American Education Research Journal

Anxiety, Stress, & Coping

Applied Psychological Measurement

Behavior Genetics

Behavior Research Methods

BMC Medical Research Methodology

Brazilian Journal of Probability and Statistics

British Journal of Mathematical and Statistical Psycho

Child Development

Communications in Statistics: Simulation and Computati

Communications in Statistics: Theory and Methods

Computational Statistics and Data Analysis

Developmental Psychology

Educational Research and Evaluation

Emotion

Frontier in Quantitative Psychology

Human Resource Management Journal

International Journal of Behavioral Development

International Journal of Osteoarchaeology

Journal of Agricultural, Biological, and Environmental

Journal of Applied Statistics

Journal of Biopharmaceutical Statistics

Journal of Early Adolescence

Journal of Educational and Behavioral Statistics  
Journal of Experimental Education  
Journal of Statistical Software  
Journal of the Royal Statistical Society  
Methodology  
Multivariate Behavioral Research  
Nursing Research  
Personality and Social Psychology Bulletin  
Perspectives on Psychological Science  
Psychological Methods  
Psychological Science  
Psychometrika  
Psychonomic Bulletin & Review  
Public Health Nutrition  
R Journal  
Religious  
Research Synthesis Methods  
Sage Open  
Social Psychological and Personality Science  
Statistics  
Statistics and Probability Letters  
Statistics in Medicine  
Structural Equation Modeling  
Studies in Nonlinear Dynamics & Econometrics  
Technological Forecasting & Social Change

**Professional Affiliations and Memberships**

American Psychological Association  
Association for Psychological Science  
Institute of Electrical and Electronics Engineers  
Psychometric Society  
Society of Multivariate Experimental Psychology  
International Society for Data Science and Analytics