

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

Professor

University of Notre Dame

2021

**Contact Information**

Office

Department of Psychology

University of Notre Dame

438 Corbett Family Hall, Notre Dame, IN 46556

Tel: (574) 631-2902; Fax: (574) 631-8883

Lab

430 Corbett Family Hall, Notre Dame, IN 46556

Tel: (574)631-5882

Email: [zzhang4@nd.edu](mailto:zzhang4@nd.edu)

Web: <https://bigdatalab.nd.edu>

Google Scholar: <https://scholar.google.com/citations?user=CPT7KjUAAAAJ>

**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**

2021–Current	Editor, Journal of Behavioral Data Science
2020–Current	Associate Editor (Editorial Board), Neurocomputing
2019	Tanaka Award for Best Article in Multivariate Behavioral Research
2019	Elected Fellow, American Psychological Association
2018–Current	President, International Society for Data Science and Analytics
2018	SMEP Early Career Research Award, Society of Multivariate Experimental Psychology
2016–Current	Associate Editor, Multivariate Behavioral Research
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, 2006, 2007 Robert J. Huskey Travel Award, University of Virginia  
2005, 2007 Travel Award, Society of Multivariate Experimental Psychology  
2003–2007 Presidential Fellowship, University of Virginia Graduate School

### Grant Support (selected)

1. *Structural Equation Modeling for Big Data Analysis*.  
Begin-End Dates: 2021–2024  
Funding source: Institute of Education Sciences  
Role: PI  
Amount: \$861,354
2. *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
3. *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  
Amount: \$573,097
4. *Lymphatic Filariasis Transmission and Elimination Modelling Using a Bayesian Data-Model Assimilation Framework*.  
Begin-End Dates: 2014–2017  
Funding source: Gates Foundation  
Role: Co-PI  
PI: Edwin Michael, University of Notre Dame  
Amount: \$345,446

**Work in Progress Books** (\*current or former graduate students; +current or former undergraduate students; ^post-doctoral researchers. At Notre Dame, papers with students are counted as first author papers.)

1. **Zhang, Z.**, & \*Liu, H. (under contract, Jan 2022). *Applied network analysis for social and behavioral research using R: A structural equation modeling framework*. Springer Nature.
2. Jacobucci, R., Grimm, K. J., & **Zhang, Z.** (under contract, 2020). *Exploratory data mining for social and behavioral scientists*. New York, NY: Guilford.
3. **Zhang, Z.** (in preparation). *Practical data processing for social and behavioral research using R*. Current version retrievable from <https://books.psychstat.org/rdata/>.

4. **Zhang, Z.** (in preparation). *Text mining for social and behavioral research using R: A case study on teaching evaluation*. Current version retrievable from <https://books.psychstat.org/textmining>.

## Journal Articles

1. **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>
2. \*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>
3. \*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>
4. 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>
5. \*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>
6. \*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>
7. \*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>
8. \*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>
9. \*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>
10. 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>
11. \*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>
12. 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>
13. \*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>
14. ^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>
15. ^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>
  16. \*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>
  17. \*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>
  18. \*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>
  19. **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>
  20. \*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>
  21. \*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>
  22. 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>
  23. \*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>
  24. \*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>
  25. **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>
  26. **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>
  27. 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>
  28. 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>
29. 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>
  30. 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>
  31. **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>
  32. 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>
  33. \*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>
  34. **Zhang, Z.** (2014a). WebBUGS: Conducting Bayesian analysis online. *Journal of Statistical Software*, 61(7), 1–30. <http://doi.org/10.18637/jss.v061.i07>
  35. **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>
  36. 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>
  37. \*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>
  38. \*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>
  39. **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>
  40. 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>
  41. 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>
  42. 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>

43. **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>
44. **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>
45. 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>
46. \*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>
47. 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>
48. **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>
49. **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>
50. \*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>
51. 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>
52. 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>
53. \*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>
54. **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>
55. \*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>
56. 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>
57. 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>

58. **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>
59. **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>
60. **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>
61. 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>
62. **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>
63. **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>
64. **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

65. 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>
66. **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>
67. **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

68. Zhang, Z., Qu, W. (Accepted). Kurtosis. Dana S. Dunn (Ed.) *Oxford Bibliographies in Psychology*. New York: Oxford University Press.
69. \*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.
70. \*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..

71. **Zhang, Z.**, <sup>+</sup>Ye, M., <sup>+</sup>Huang, Y., & <sup>+</sup>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).
72. **Zhang, Z.**, & <sup>\*</sup>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.
73. <sup>^</sup>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.
74. <sup>\*</sup>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.
75. **Zhang, Z.**, Wang, L., & <sup>\*</sup>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.
76. <sup>\*</sup>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.
77. <sup>\*</sup>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.
78. <sup>\*</sup>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.
79. 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.
80. 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.



81. **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

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

### Book Review

85. **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

86. +Xu, J., **Zhang, Z.**, & \*Qu, W. (2018). webnetvis: Interactive network visualization online [Computer software]. Retrieved from <https://webnetvis.psychstat.org>.
87. \*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>.
88. **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>.
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### Doctoral Dissertations Directed

- 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 data scientist at Multi Health Systems Inc., 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)