

## Curriculum Vitae

**Zhiyong Johnny Zhang**

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**EDUCATION**

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

**EMPLOYMENT**

2015-Now	Associate Professor	University of Notre Dame
2016-Now	Fellow	Institute for Educational Initiatives
2010-2015	Assistant Professor	University of Notre Dame
2008-2010	Research Assistant Professor	University of Notre Dame

**HONORS AND AWARDS**

2016-Now	Associate Editor, Multivariate Behavioral Research
2016	Elected member of Society of Multivariate Experimental Psychology
2009, 2011	University of Notre Dame International Travel Award
2007-2008	Society of Multivariate Experimental Psychology Dissertation Award
2007-2008	University of Virginia Dissertation Year Fellowship
2007	Young Scientists Scholarship, the 15th International and 72nd Annual Meeting of the Psychometric Society
2006, 2007	American Psychological Association Travel Award
2005-2007	Robert J. Huskey Travel Award, University of Virginia
2005, 2007	Society of Multivariate Experimental Psychology Travel Award

2003-2007 Presidential Fellowship, University of Virginia Graduate School

## GRANTS AND SPONSORED PROGRAMS

2017 PI ISLA Testing a Latent Trait Model with Orthogonal and Unorthogonal Factor Structures, \$2,500.

2016 PI Digital Learning Initiatives Developing an online textbook for Advanced Statistics, \$500.

2015-2018 Co-PI NSF Structural Equation Modeling with Small N and Large p, \$430,725. (PI: Ke-Hai Yuan)

2014-2017 Co-PI Gates Foundation Lymphatic filariasis transmission and elimination modelling using a Bayesian Data-Model Assimilation framework, \$345,446. (PI: Edwin Michael)

2014-2017 PI Institute of Education Sciences A General Framework for Statistical Power Analysis with Non-normal and Missing Data through Monte Carlo Simulation, \$573,097. (PI: Zhiyong Zhang)

2015 Co-PI Global Collaboration Initiative International collaboration to develop cutting-edge methodology for advancing social, behavioral and education sciences (Co-PI: Ke-Hai Yuan)

2012-2015 Senior Staff National Science Foundation MRI: Acquisition of Data Analytics Cluster for Computational Social Sciences, \$451,839. (PI: Jarek Nabrzyski)

2012-2013 PI Center for Creative Computing A Web interface for drawing path diagrams for structural equation modeling, \$4,000.

2012-2013 PI ISLA A Web interface for drawing path diagrams for structural equation modeling, \$2,500.

2009-2010 PI Faculty Research Grants A general Bayesian estimation method for structural equation modeling, \$10,000.

2009-2010 PI ISLA Seed Grants for Cooperative Projects: Daily religious research, \$4,000.

## REFEREED JOURNAL ARTICLES (current or former students)

1. Mai, Y., & Zhang, Z. (in press). Review of Software Packages for Bayesian Multilevel Modeling. *Structural Equation Modeling*.
2. Cain, M., Zhang, Z., & Bergeman, C. S. (in press). Time and Other Considerations in Mediation Design. *Educational and Psychological Measurement*.

3. Ke, Z., & Zhang, Z. (in press). Testing Autocorrelation and Partial Autocorrelation: Asymptotic Methods versus Resampling Techniques. *British Journal of Mathematical and Statistical Psychology*.
4. Tong, X., & Zhang, Z. (2017). Outlying Observation Diagnostics in Growth Curve Modeling. *Multivariate Behavioral Research*, 52(6), 768–788.
5. 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.
6. Cain, M., 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.
7. Liu, H., & Zhang, Z. (2017). Logistic Regression with Misclassification in Binary Outcome Variables: A Method and Software. *Behaviormetrika*, 44(2), 447–476.
8. 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.
9. 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.
10. 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.
11. Zhang, Z. (2016). Modeling Error Distributions of Growth Curve Models through Bayesian Methods. *Behavior Research Methods*, 48(2), 427-444.
12. 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.
13. 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.
14. 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.
15. 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.

16. 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.
17. 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.
18. 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.
19. 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.
20. Zhang, Z. (2014a). WebBUGS: Conducting Bayesian Analysis online. *Journal of Statistical Software*, 61(7), 1-30.
21. Zhang, Z. (2014b). Monte Carlo Based Statistical Power Analysis for Mediation Models: Methods and Software. *Behavior Research Methods*, 46(4), 1184-1198
22. Tong, X., & Zhang, Z. (2014). Abstract: Semiparametric Bayesian Modeling With Application in Growth Curve Analysis. *Multivariate Behavioral Research*, 49, 299-299.
23. Song, H., & Zhang, Z. (2014). Analyzing Multiple Multivariate Time Series Data Using Multilevel Dynamic Factor Models. *Multivariate Behavioral Research*, 49(1), 67-77.
24. 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.
25. Zhang, Z. (2013). Bayesian Growth Curve Models with the Generalized Error Distribution. *Journal of Applied Statistics*, 40(8), 1779-1795.
26. 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://dx.doi.org/10.1080/10705511.2013.797837>.
27. 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.
28. 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. <http://www.tandfonline.com/eprint/4XE3CQai8dTixwY2tPKv/full>

29. 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. <http://www.tandfonline.com/eprint/bI5aVbVq2uwI7Xs8HiBq/full>
30. Zhang, Z., & Wang, L. (2013). Methods for mediation analysis with missing data. *Psychometrika*, 78(1), 154-184.
31. Yuan, K.-H., & Zhang, Z. (2012). Robust Structural Equation Modeling with Missing Data and Auxiliary Variables. *Psychometrika*, 77(4), 803-826.
32. Tong, X., and Zhang, Z. (2012). Diagnostics of Robust Growth Curve Modeling using Student's t Distribution. *Multivariate Behavioral Research*, 47(4), 493-518.
33. 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.
34. 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.
35. 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.
36. Wang, L. & Zhang, Z. (2011). Estimating and testing mediation effects with censored data. *Structural Equation Modeling*, 18(1), 18-34.
37. 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. doi: 10.1037/a0021600.
38. 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.
39. 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.
40. Xin, T., Zhang, Z., & Yuan, K.-H. (2011). Evaluation of Test Statistics for Robust Structural Equation Modeling with Non-normal Missing Data (Abstract). *Multivariate Behavioral Research*, 46(6), 1016-1016.
41. Lu, L., Zhang, Z., & Lubke, G. (2010). Bayesian Inference For Growth Mixture Models With Non-ignorable Missing Data (Abstract). *Multivariate Behavioral Research*, 45(6), 1028-1028.

42. 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.
43. 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.
44. Zhang, Z., & Wang, L. (2009). Statistical power analysis for growth curve models using SAS. *Behavior Research Methods*, 41(4), 1083-1094.
45. 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.
46. 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.
47. 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.
48. 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.
49. 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.
50. Zhang, Z., & Nesselroade J. R. (2007). Bayesian estimation of categorical dynamic factor models. *Multivariate Behavioral Research*, 42(4), 729-756.

## BOOKS & MONOGRAPHS

51. Zhang, Z. & Wang, L. (2017). *Advanced statistics using R*. [https://advstats.psychstat.org/]. Granger, IN: ISDSA Press. ISBN: 978-1-946728-01-2.
52. Zhang, Z., & Yuan, K.-H. (2017). *Practical Statistical Power Analysis Using Webpower and R* (Eds). Granger, IN: ISDSA Press.

## REFEREED PUBLICATIONS IN PROCEEDINGS AND BOOKS

53. Zhang, Z., & Liu, H. (in press). 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*.
54. 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, Asheville, North Carolina, 2016*. Springer Proceedings in Mathematics & Statistics. (pp. 381-393)
55. Han, D., 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, Asheville, North Carolina, 2016*. Springer Proceedings in Mathematics & Statistics. (pp. 373-380)
  56. 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*. Springer Proceedings in Mathematics & Statistics. (pp. 341–355).
  57. 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*. Springer Proceedings in Mathematics & Statistics. (pp. 357–370).
  58. Lu, Z., Zhang, Z., & Cohen, A. (2014). 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*, volume 89 of Springer Proceedings in Mathematics & Statistics (pp. 319–341). Springer International Publishing.
  59. 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*, volume 66 of Springer Proceedings in Mathematics & Statistics (pp.275–304). Springer New York.
  60. 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 Jersey: Lawrence Erlbaum Associates.
  61. 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 Jersey: Lawrence Erlbaum Associates.
  62. 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

63. Liu, H., & Zhang, Z. (accepted). Probit Transformation. *The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation*.
64. Zhang, Z. (accepted). Moments of a Distribution. *The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation*.
65. Cain, M., & Zhang, Z. (accepted). Posterior. *The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation*.

## OTHER PUBLICATIONS

66. Zhang, Z. (in press). Psychometrics from a Bayesian Perspective: A review of Bayesian Psychometric Modeling (Levy & Mislevy, 2016). Book Review. *Journal of Educational and Behavioral Statistics*.
67. Winter, W., Potenziano, B., Zhang, Z., Green, N., & Hammond, W. (2010). Chronotype as a predictor of performance in major league baseball pitchers, *Sleep*, 2010, 33, A188-A189.

## SOFTWARE DEVELOPMENT

68. Zhang, Z., & Keenan, A. (2017) WebPower: An Android App for Statistical Power analysis.
69. Zhang, Z., Yuan, K.-H., & Cain, M. (2016). Software for estimating univariate and multivariate skewness and kurtosis. Retrieved from <http://psychstat.org/nonnormal>
70. Ke, Z., & Zhang, Z. (2016). pautocorr: Testing Autocorrelation and Partial Autocorrelation Through Bootstrap and Surrogate Methods. R package retrievalbe from <https://r-forge.r-project.org>.
71. Liu, H., & Zhang, Z. (2016). logistic4p: Logistic Regression with Misclassification in Dependent Variables. R package retrievalbe from <https://r-forge.r-project.org>.
72. Mai, Y., Zhang, Z., & Yuan, K.-H. (2015) An Online Interface for Drawing Path Diagrams for Structural Equation Modeling. Retrieved from <http://semdiag.psychstat.org>
73. Zhang, Z., Yuan, K.-H., & Mai, Y. (2015-2017). WebPower: Statistical power analysis online. Retrieved from <http://webpower.psychstat.org>.
74. Zhang, Z., & Yuan, K.-H. (2015). coefficientalpha: Robust Cronbach's alpha and McDonald's omega for non-normal and missing data. <http://CRAN.R-project.org/package=coefficientalpha>
75. Zhang, Z. (2014-2017). WebBUGS: Conducting Bayesian Analysis online. Retrievalbe from <http://webbugs.psychstat.org>.
76. Zhang, Z., Jiang, J., & Liu, H. (2013). An online software for meta-analysis of correlation. Available at <http://webbugs.psychstat.org/modules/metacorr/>.



77. Zhang, Z., McArdle, J. J., Hamagami, F., & Grimm, K. J. (2013). RAMpath: Structural Equation Modeling using RAM Notation. R package version 0.3.6. <http://CRAN.R-project.org/package=RAMpath>
78. Zhang, Z. & Yuan, K.-H. (2012-2017). WebSEM: Conducting SEM analysis online. Available at <https://websem.psychstat.org>. (No access information available)
79. Yuan, K.-H. & Zhang, Z. (2011). rsem: An R package for robust structural equation modeling with non-normal and missing data. Retrievable from <http://www.r-project.org>. (No access information available)
80. Zhang, Z. & Yuan, K.-H. (2011). semdiag: An R package for structural equation modeling diagnostics. Retrievable from <http://www.r-project.org>. (No access information available)
81. Zhang, Z., & Wang, L. (2011). bmem: An R packages for mediation analysis with ignorable and non-ignorable missing data. Retrievable from <http://www.r-project.org>. (Accessed more than 2,000 times for a simplified version of bmem)
82. Zhang, Z., & Wang, L. (2009). SAS macros for power analysis of growth curve models, Version 1.0. Retrievable from <http://saspower.psychstat.org> (Accessed more than 10,000 times)
83. Zhang, Z., & Wang, L. (2008). BAUW as an OpenBUGS plugin, Version 1.0. Retrievable from <http://bauw.psychstat.org> (Accessed more than 10,000 times)
84. Zhang, Z., & Wang, L. (2007). MedCI: Mediation Confidence Intervals, Version 3.0. Retrievable from <http://medci.psychstat.org> (No access information available)
85. Zhang, Z., & Wang, L. (2006). BAUW: Bayesian Analysis Using WinBUGS, Version 1.0. Retrievable from <http://bauw.psychstat.org> (Accessed more than 10,000 times)
86. Zhang, Z. (2006). LDSM: A C++ program for generating codes for analyzing latent difference score model in Mplus. Retrievable from <http://www.psychstat.org/us/article.php/38> (Accessed more than 4,000 times)
87. Zhang, Z., & Nesselroade, J. R. (2005). Selection: A C++ program for analyzing selection effects. Retrievable from <http://www.psychstat.org/us/article.php/64> (Accessed more than 2,000 times)
88. Zhang, Z., & Nesselroade, J. R. (2004). DFA: Dynamic Factor Analysis, Version 2.0. Retrievable from <http://dfa.psychstat.org> (No access information available)

## **INVITED LECTURES AND ADDRESSES**

1. Zhang, Z. (2017, June). Modeling Non-normal Distributions in Mixed-effects and Multilevel Models. Paper presented at the 2017 ICSA Applied Statistics Symposium, Chicago, IL.

2. Zhang, Z. (2017, May). Statistical Methods and Software for Handling Non-normal in Social, Behavioral and Economic Sciences. Invited talk at Henan University, Kaifeng, China.
3. Zhang, Z. (2017, Mar). Two-Stage Bayesian Estimation in Structural Equation Modeling. Invited talk at ACMS Statistics Seminar, Department of ACMS, University of Notre Dame, Notre Dame, IN.
4. 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, October 18, 2016, Richmond, VA.
5. Zhang, Z., & Yuan, K.-H. (2015, December). Online statistical software for simple and complex models. Invited poster presented at the IES PI meeting, Washington, D.C.
6. Zhang, Z. (2015, June). Statistical Power Analysis for Mediation Effects through WebPower. Invited talk at the Renmin University of China. Beijing, China.
7. Zhang, Z. (2015, March). Bayesian factor analysis. Invited talk at the University of Southern California. Los Angeles, CA.
8. Zhang, Z. (2014, September). The use of relaxed and Bayesian assumptions on error terms in dynamic models of change. Paper presented at 2014 SRCD Themed Meeting: Developmental Methodology, San Diego, CA.
9. 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. Paper presented at the 2nd Institute of Mathematical Statistics Asia Pacific Rim Meeting (Invited Paper Session). Tsukuba, Japan.
10. Lu, Z., Zhang, Z., & Lubke, G. (2012, January). Bayesian inference for growth mixture models with latent class dependent missing data. Invited Presentation, Hong Kong Institute of Education, Hong Kong.
11. June 7-16, 2011: Invited lecture on Introduction to Bayesian Analysis at the Renmin University of China.
12. Zhang, Z., McArdle, J. J., & Nesselroade, J. R. (2011, May). Growth Rate Models: Emphasizing Growth Rate Analysis through Growth Curve Modeling. Invited talk at Nesselroade Festschrift, Charlottesville, VA
13. July 27-29, 2009: Workshop on Bayesian Analysis at the University of Southern California

## CONFERENCE PRESENTATIONS

### Organized Meetings

14. Yuan, K.-H., & Zhang, Z. (May, 2017). Statistics in Social Sciences: Present and Future. Beijing, China.

#### Chaired Symposiums

15. Zhang, Z., & Yuan, K.-H. (2015, May, Chaired Symposiums). Methods and Software for Statistical Power Analysis with Non-normal Data. Symposium presented at the 27th Annual Convention of the American Psychological Society, New York, NY.
16. Zhang, Z. (2014, May). New Developments in Bayesian Analysis. Symposium presented at the 26th Annual Convention of the American Psychological Society, San Francisco CA.
17. Zhang, Z., & Yuan, K.-H. (2012, May). Robust Statistical Data Analysis. Symposium presented at the 24th Annual Convention of the American Psychological Society, Chicago IL.
18. Zhang, Z. (2011, August). Bayesian Methods for Non-Normal and Non-Ignorable Missing Data Analysis. Symposium presented at the 119th Annual Convention of the American Psychological Association, Washington DC.

#### Workshops

19. Zhang, Z. (2016, August). Practical Statistical Power Analysis for Simple and Complex Models. Workshop conducted for the American Psychological Association Convention in Denver, Colorado, August 4-7, 2016.
20. Zhang, Z., & Yuan K.-H. (2013, August). Robust SEM for Non-Normal and Missing Data Using WebSEM. Workshop presented at the 119th Annual Convention of the American Psychological Association, Washington DC.
21. Zhang, Z. (2009, August). Introduction to Bayesian analysis. Workshop presented at the 117th Annual Convention of the American Psychological Association, Toronto, Canada.

#### Paper Presentations

22. Zhang, Z. (2017, Oct). Two-Stage Bayesian Estimation in Structural Equation Modeling. Paper presented at 2017 SMEP meeting, Minneapolis, MN.
23. 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, July 12-15, Asheville, NC.
24. 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, July 12-15, Asheville, NC.

25. Cain, M. K., & Zhang, Z. (2016, May). Time and Other Considerations in Mediation Design. Poster presented at the 2017 Modern Modeling Methods Conference, May 23-26, 2016, in Storrs, CT.
26. 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 American Psychological Society, New York, NY.
27. 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.
28. 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.
29. 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.
30. 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 American Psychological Society, San Francisco, CA.
31. 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 American Psychological Society, San Francisco, CA.
32. 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 American Psychological Society, San Francisco, CA.
33. Lu, Z., & Zhang, Z. (2014, April). Robust Growth Mixture Models With Non-Ignorable Missingness. Paper presentation at the National Council on Measurement in Education (NCME) 2014 Annual Meeting, Philadelphia, Pennsylvania.
34. Liu, X., Liu, F., Simon, M., & Zhang, Z. (2014, April). Are the Score Gains Suspicious? – A Bayesian Growth Analysis Approach. Paper presentation at the National Council on Measurement in Education (NCME) 2014 Annual Meeting, Philadelphia, Pennsylvania.
35. Zhang, Z., & Grimm, K. J. (2013, April). A Random-Coefficient Latent Change Score Model for Nonlinear Growth Data. Paper presented at 2013 SRCD Biennial Meeting, Seattle, Washington.
36. 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 American Psychological Society, Chicago IL.

37. 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 American Psychological Society, Chicago IL.
38. 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 American Psychological Society, Chicago IL.
39. Lu, Z., & Zhang, Z. (2012, May). Robust Growth Mixture Modeling Using Bayesian Methods. Paper presented at the 24th Annual Convention of the American Psychological Society, Chicago IL.
40. 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. Paper presented at the 2nd Institute of Mathematical Statistics Asia Pacific Rim Meeting (Invited Paper Session). Tsukuba, Japan.
41. Lu, Z., Zhang, Z., & Cohen, A. (2012, July). Latent growth curve models with non-ignorable missing data: Bayesian inference and model selection criteria. Paper presentation at the 77th Annual International Meeting of the Psychometric Society (IMPS 2012), Lincoln, Nebraska.
42. Zhang, Z. & Lu, Z. (2012, February). Issues in Aggregating Time Series: Illustration Through an AR(1) Model. Paper presented at 2012 SRCD Themed Meeting: Developmental Methodology, Tampa, Florida.
43. Lu, Z., Zhang, Z., & Cohen, A. (2012, April). Latent growth curve models with non-ignorable missing data: Bayesian inference and model selection criteria. Paper presentation at the National Council on Measurement in Education (NCME) 2012 Annual Meeting, Vancouver, British Columbia, Canada.
44. Xin, T., Zhang, Z., & Yuan, K.-H. (2011). Evaluation of Test Statistics for Robust Structural Equation Modeling with Non-normal Missing Data. Presented at the Annual Society of Multivariate Experimental Psychology Graduate Student Pre-conference, Oklahoma.
45. 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.
46. 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.
47. 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.

48. 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.
49. Lu, Z., Zhang, Z., & Lubke, G. (2011, July) Bayesian inference for growth mixture models with latent class dependent missing data. Paper presentation at the 76th Annual International Meeting of the Psychometric Society (IMPS 2011), Hong Kong Institute of Education, Hong Kong.
50. Lu, Z., Zhang, Z., & Lubke, G. (2010, September) Bayesian inference for growth mixture models with non-ignorable missing data. Paper presentation at the 8th Annual Society of Multivariate Experimental Psychology (SMEP), Graduate Student Pre-conference, Georgia Tech Conference Center, Atlanta, GA.
51. 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.
52. Zhang, Z. (2009, June). Bayesian SEM: Current developments and future directions. Paper presented at the American Psychological Society Meeting, San Francisco, CA.
53. Zhang, Z. (2007, October). Bootstrap analysis of mediation effects. Paper presented at the Society of Multivariate Experimental Psychology Pre-conference, Chapel Hill, NC.
54. 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.
55. 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.
56. 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

57. 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.
58. 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 American Psychological Society, Boston, MA.
59. 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, in Storrs, CT.

60. Mai, Y., & Zhang, Z. (2016, May). Multilevel Modeling Through Path Diagramming: An Online Graphical Interface. Poster presented at the 28th APS Annual Convention, May 26-29, 2016, in Chicago, IL.
61. 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, October 7, 2015, Westville, IN.
62. 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.
63. 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.
64. 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.
65. 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.
66. 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.

#### **MASTER'S THESES DIRECTED**

2012	Xin Tong
2015	Megan Cain

#### **DOCTORAL DISSERTATIONS DIRECTED**

2011	Zhenqiu Lu (Now tenured Associate professor at the University of Georgia, co-advised with Ke-Hai Yuan)
2014	Xin Tong (Now tenure-track assistant professor at the University of Virginia)
2017	Megan Cain (Now research assistant professor at University of Texas at San Antonio)

#### **DISSERTATION COMMITTEES**

2017	Han Du, Meghan Cain, Amber Shoaib, Jaime Shapiro, Robert Miller
2016	Patrick Miller, Han Du, Daniel McArtor, Can Shao, Callie Baird

2015	Qian Zhang, Quinn Lathrop
2014	Charles Laurin, Raymond Walters, Jeffrey Patton, Xin Tong
2013	Zijun Ke
2012	Chun-Ting Lee, KeKe Lai
2011	Melissa Mitchell, Laura Lu
2010	Stephen Tueller

### **QUANTITATIVE MINOR ADVISED**

2010	Windy McNerney
2015	Rebecca Cheung

### **UNDERGRADUATE STUDENTS ADVISED**

Brett Baumgartner (2016 Summer), Yijie Huang (2016 Summer), Miao Ye (2016 Summer), Nan Sun (2016 Summer), Ann Keenan (2016-), Leah Tzakis (2014-), David Mattia (2015-), Cindy Wang (2015-), Xin Tong (2017-), Christopher Clarizio (2017-), Kelly Dodson (2017-), Yuchen Liu (2017 Summer), Yiwen Chen (2017 Summer).

### **COURSES TAUGHT**

2017-2018	Advanced Statistics (PSY40120); Bayesian Statistics (PSY60108); Structural Equation Modeling (PSY60130); Grad Seminar: Quantitative Study (PSY63199)
2016-2017	Advanced Statistics (PSY40120); Structural Equation Modeling (PSY60130); Grad Seminar: Quantitative Study (PSY63199)
2015-2016	Advanced Statistics (PSY40120); Bayesian Statistics (PSY60108); Structural Equation Modeling (PSY60130); Grad Seminar: Quantitative Study (PSY63199)
2013-2014	Advanced Statistics (PSY40120); Bayesian Statistics (PSY60108); Structural Equation Modeling (PSY60130); Grad Seminar: Quantitative Study (PSY63199)
2012-2013	Advanced Statistics (PSY40120); Exploratory Data Analysis (PSY30105/PSYC60105); Structural Equation Modeling (PSY60130); Grad Seminar: Quantitative Study (PSY63199)
2011-2012	Advanced Statistics (PSY40120); Bayesian Statistics (PSY60108); Grad Seminar: Quantitative Study (PSY63199); Structural Equation Modeling (PSY60130)



2010-2011    Advanced Statistics (PSY40120); Bayesian Statistics (PSY60108);  
Exploratory Data Analysis (PSY30105/PSYC60105)

2009-2010    Bayesian Statistics (PSY60108); Dynamical Systems Analysis

## **PROFESSIONAL AFFILIATIONS AND MEMBERSHIPS**

Psychometric Society

American Psychological Association

American Psychological Society

Society for Research in Child Development

Society of Multivariate Experimental Psychology

## **SERVICES**

### **University and Departmental Service**

2008-NOW    Psychology Department Computer Committee

### **Professional Service**

#### Associate Editor

Multivariate Behavioral Research

#### Guest Action Editor

Psychological Methods (2016, 2017)

Sage Open (2017)

#### Consulting editor

Psychological Methods, 2014 - now

#### Grant reviewer

National Science Foundation, 2012, 2017

National Security Agency, 2013

Templeton Foundation, 2013

Natural Sciences and Engineering Research Council of Canada, 2015, 2017

#### Manuscript reviewer (ad hoc)

Structural Equation Modeling

Multivariate Behavioral Research

British Journal of Mathematical and Statistical Psychology  
Psychological Methods  
Methodology  
Psychometrika  
International Journal of Behavioral Development  
International Journal of Osteoarchaeology  
Emotion  
Statistics and Probability Letters  
Developmental Psychology  
Brazilian Journal of Probability and Statistics  
Computational Statistics and Data Analysis  
Journal of Applied Statistics  
Behavior Research Methods  
Statistics and Probability Letters  
Aging, Neuropsychology and Cognition  
Behavior Genetics  
Journal of Statistical Software  
Child Development  
Journal of Experimental Education  
Technological Forecasting & Social Change  
Perspectives on Psychological Science  
Frontier in Quantitative Psychology  
Abstract and Applied Analysis  
Religious  
Journal of Agricultural, Biological, and Environmental Statistics  
Psychonomic Bulletin & Review  
Personality and Social Psychology Bulletin  
Statistics in Medicine  
American Education Research Journal  
Studies in Nonlinear Dynamics & Econometrics  
Journal of Biopharmaceutical Statistics  
Sage Open  
Journal of Early Adolescence

Book reviewer

Guilford

Other services

Hosting a psychometrical website <http://psychstat.org/us> for research community. It has more than 189,000 unique visits and more than 519,000 page loads. For example, the page providing a SAS program for Monte Carlo simulation (<http://www.psychstat.org/us/article.php?articleid=62>) has been accessed more than 23,000 times.