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Professor
University of Notre Dame
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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

<u>External (funded)</u>

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*
2. *Tong, L., & Zhang, Z. (accepted). Neural Network Analysis of Psychological Data: A Step-by-Step Guide. *Multivariate Behavioral Research*
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., 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

13. 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
14. *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
15. *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
16. 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
17. *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
18. *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
19. *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
20. *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
21. *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
22. *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
23. 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
24. *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
25. 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
26. 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

27. 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
28. *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
29. 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
30. 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
31. *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
32. *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
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34. *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
35. *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
36. *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
37. 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
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40. *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
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95. Zhang, Z. & Wang, L. (2017). *Advanced statistics using R*. Granger, IN: ISDSA Press. Retrievable from https://advstats.psychstat.org/.

Refereed Publications in Proceedings and Books

96. 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.
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98. Zhang, Z., Qu, W. (2020). Kurtosis. Dana S. Dunn (Ed.) *Oxford Bibliographies in Psychology*. New York: Oxford University Press.

99. *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.
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102. 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.
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107. *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.
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(Eds), *Statistical methods for modeling human dynamics: An interdisciplinary dialogue* (pp. 319–348). New York, NY: Lawrence Erlbaum Associates.

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Encyclopedia Entries

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Book Review

115. 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

116. +Xu, J., Zhang, Z., & *Qu, W. (2018). webnetvis: Interactive network visualization online [Computer software]. Retrieved from https://webnetvis.psychstat.org.

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132. 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.
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138. 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.
139. 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.
140. 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., $^{+}$Ye, M., $^{+}$Huang, Y., & $^{+}$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

1. Zhang, Z., & Yuan, K.-H. (2024, July). *The 2024 ISDSA Meeting on Behavioral Data Science*. Vienna, Austria.
2. Zhang, Z., & Yuan, K.-H. (2023, July). *The 2023 ISDSA Meeting on Behavioral Data Science*. Shanghai, China.
3. Zhang, Z., & Yuan, K.-H. (2022, May). *The 2022 ISDSA Meeting on Behavioral Data Science*. Notre Dame, IN.
4. Zhang, Z., & Yuan, K.-H. (2021, June). *The 2021 ISDSA Meeting on Behavioral Data Science*. Notre Dame, IN. (Online)
5. Zhang, Z., & Yuan, K.-H. (2020, May). *The 2020 Annual Meeting of the International Society for Data Science and Analytics*. Notre Dame, IN. (Online)
6. Zhang, Z., & Yuan, K.-H. (2019, July). *The 2019 Annual Meeting of the International Society for Data Science and Analytics*. Nanjing, China.
7. Yuan, K.-H., & Zhang, Z. (2017, May). *Statistics in social sciences: Present and future*. Beijing, China.

Chaired Symposiums

8. Zhang, Z. (2025, August). Structural Equation Models with Social Network Data. Symposium at the 2025 Annual Convention of APA, Denver, CO.
9. 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.
10. Zhang, Z. (2024, July). New insights in longitudinal data and mediation analysis. Symposium organized at the IMPS 2024 Annual Meeting, Prague, Czech.
11. 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.
12. 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.
13. 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.
14. 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

1. Zhang, Z. (2025, July). Invited workshop on *Structural Equation Models with Social Network Data* at the 2025 ISDSA Annual Meeting. Washington, DC.
2. Zhang, Z. (2023, July). Invited workshop on *Deep Learning Using R* at the 2023 ISDSA Annual Meeting. Online.
3. Du, H. & Zhang, Z. (2023, May). *Power Analysis*. Invited workshop conducted at the 2023 Annual Convention of Association for Psychological Science, Washington DC.
4. Tong, X., Du, H., & Zhang, Z. (2022, June). Workshop on *Bayesian Longitudinal Data Modeling*. Two-day workshop supported by the Association of Psychological Science.
5. Zhang, Z. (2022, June). *Workshop on Statistical Power Analysis for Structural Equation Modeling* at the 2022 ISDSA Annual Meeting. Online.
6. Zhang, Z. (2021, June). *Workshop on Statistical Power* analysis at the 2021 ISDSA Annual Meeting. Online.
7. 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.
8. 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.
9. 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.
10. Zhang, Z. (2009, August). *Introduction to Bayesian analysis*. Workshop presented at the 117th Annual Convention of the American Psychological Association, Toronto, Canada.

<u>Paper Presentations</u>

11. 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.
12. Zhang, Z. (2024, July). Mediation Analysis with Text Data. Paper presented at the IMPS 2024 Annual Meeting, Prague, Czech.
13. Zhang, Z. (2023, October). WebPower as an open system for statistical power analysis. Online presentation at the 2023 SMEP Meeting.
14. +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.
15. *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.
16. *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.
17. 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.

18. *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)
19. *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)
20. *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.
21. *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.
22. 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.
23. *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.
24. 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.
25. *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.
26. 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.
27. *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.
28. 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.
29. *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.
30. 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.
31. *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.
32. *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.

33. *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.
34. 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.
35. *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.
36. 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.
37. 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.
38. 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.
39. 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.
40. *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.
41. *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.
42. *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.
43. 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.
44. *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.
45. *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.
46. 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.

47. *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.
48. 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.
49. *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.
50. *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.
51. *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.
52. 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.
53. 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.
54. 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.
55. 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.
56. 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.
57. 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

58. Parra, D., Radvansky, G.A., Zhang, Z. (2024, April). A Meta-Analysis of the Wakeful Rest Effect. The 2024 Midwestern Psychological Association Conference.
59. 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.
60. +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.
61. +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.

62. 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.
63. 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.
64. *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.
65. ^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.
66. *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.
67. *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.
68. 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.
69. 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.
70. 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.
71. 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.
72. 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.
73. 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

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

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)

Undergraduate Students Advised

2023 Julia Savino, Caroline Schafer, Annie Lee, Anna Krush, Anna Kierski, Aedan Joel, Austin Wyman
2022 Weining Wang, Lirui Xiao, Xinyu Wei, Xinran She, Zheyuan Cui, Austin Wyman, Aedan Joel, Rena Steele, Sarah Deussing, Kyle Phan
2021 Shuangtong Li, Caroline Smith, Xueyang Li, Jiarui Hai, Lijin Zhang, Yutong Yang
2020 Keyu Han, Yunlu Chen, Xueyang Li, Changrong Xiao, Yuxin Wu
2019 Jacob Chang, Lingbo Tong, Zhaowen Wang, Shivani Kamtikar
2018 Shitao Fan, Jingyi Xu, Silvia Camara, Roann Yanes, Ann Keenan, Leah Tzakis
2017 Christopher Clarizio Kelly Dodson, Xin Tong, Yiwen Chen, Margaret West, Jianan Wang, Ann Keenan, Leah Tzakis, Yuchen Liu
2016 Ann Keenan, Leah Tzakis, David Mattia, Cindy Wang, Brett Baumgartner, Yijie Huang, Mao Ye, Nan Sun
2015 Ann Keenan, Leah Tzakis, David Mattia, Cindy Wang
2014 Leah Tzakis, Leah Tzakis

Master's Theses Directed

2015 Megan Cain
2012 Xin Tong

Master Thesis Paper Reader (For students already with a master degree, they need to have a paper approved by two readers to pass the qualification exam.)

2022 Meng Qiu
2022 Dayoung Lee
2020 Tyler Wilcox
2020 Max Hong
2019 Brenna Gomer
2019 Wen Qu
2019 Alex Brodersen
2018 Ian Campbell
2014 Can Shao

Master Thesis Committees

2023 Dani Parra

2022 Jessica Hocking
2022 Kenneth McClure
2019 Lauren Trichtinger
2019 Chang Che
2016 Ryan Woodbury
2015 Callie Baird
2012 Zijun Ke

Qualification Exams/ Prelim Committee
2022 Meng Qiu, Xiaobei Li
2021 Tyler Wilcox, Xiao Liu
2020 Chang Che, Wen Qu, Daniella Reboucas, Lauren Trichtinger, Brenna Gomer
2019 Alex Brodersen
2018 Ian Campbell
2016 Samantha Anderson, Haiyan Liu
2013 Charles Laurin, Raymond Walters
2012 Xin Tong
2011 Keke Lai

Dissertation Committees
2023 Dayoung Lee, Meng Qiu
2022 Claire Scott-Bacon (proposal), Xiao Liu, Tyler Wilcox
2021 Brenna Gomer, Maxwell Hong, Minami Hattori, Lauren Trichtinger
2020 Jaime Shapiro, Alex Brodersen
2018 Agung Santoso, Miao Yang, Ge Jiang, Erin Hillard, Robert Miller
2017 Han Du, Meghan Cain, Amber Shoaib
2016 Patrick Miller, Daniel McArtor, Can Shao, Callie Baird
2015 Qian Zhang, Quinn Lathrop
2014 Charles Laurin, Raymond Walters, Jeffrey Patton
2013 Zijun Ke
2012 Chun-Ting Lee, KeKe Lai
2011 Melissa Mitchell
2010 Stephen Tueller

Quantitative Minor Advised
2015 Rebecca Cheung (Associate Professor at the University of Reading)
2010 Windy McNerney

Services

University and Departmental Service

2024-Crurrent	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