

# Jihong Zhang, Dr.

## *Educational Statistics and Research Methods*

133B Graduate Education Building  
University of Arkansas  
✉ jzhang@uark.edu  
🌐 <http://jihongzhang.org>  
🔗 JihongZ  
🌐 jihongzhang  
ORCID:0000-0003-2820-3734

### Education Background

- 2019-2022 **Ph.D.**, *Educational Measurement and Statistics*, University of Iowa  
2015-2018 **M.S.**, *Research, Evaluation, Measurement and Statistics*, University of Kansas  
2009-2013 **B.A.**, *Applied Psychology*, Soochow University, China  
2011-2013 **B.A.**, *Law*, Soochow University, China

### Employment

- 01/01/2024 **Assistant Professor of Educational Statistics and Research Methods**, *Department of Counseling, Leadership, and Research Methods*, College of Education and Health Professions, University of Arkansas  
- Current  
12/31/2022- **Postdoctoral Research Fellow**, *Department of Social Work*, CLAP@JC Program, The Chinese University of Hong Kong (CUHK)  
6/30/2023  
06/2021 - **Associated Researcher**, *Stanford Research Institute (SRI) International*, California, United States  
01/2022  
01/2019 - **Research Assistant**, *NSF Grant*, Jonathan Templin, University of Iowa  
12/2022  
09/2016 - **Research Assistant**, *The Center for Educational Testing and Evaluation*, Kansas English Language Proficiency Assessment (KELPA), University of Kansas  
12/2018

### Teaching Experience

- Spring 2024 **ESRM6553**, *Advanced Multivariate Analysis: Bayesian Analysis with Stan*, University of Arkansas  
Spring 2018 **EPSY905**, *Fundamentals of Multivariate Modeling*, University of Kansas  
Fall 2017 **EPSY906**, *Latent Trait Measurement and Structural Equation Modeling*, University of Kansas

### Relevant Coursework

- Spring 2020 **PSQF7455**, *Generalizability Theory*, Won-Chan Lee, University of Iowa  
Fall 2019 **STAT4540**, *Statistical Learning*, Sanvesh Srivastava, University of Iowa  
**PSQF7375**, *Diagnostic Assessment*, Jonathan Templin, University of Iowa  
Spring 2019 **PSQF7375**, *Bayesian Psychometric Models*, Jonathan Templin, University of Iowa  
**BIOS7240**, *High-Dimensional Data Analysis*, Patrick Breheny, University of Iowa  
Spring 2018 **CLDP944**, *Advanced Multilevel Models*, Paul Johnson, University of Kansas

- Fall 2017 **CLDP944**, *Multilevel Modeling, Longitudinal & Repeated Measure Data*, Lesa Hoffman, University of Kansas
- EDUC800**, *Latent Trait Measure and Structural Equation Modeling*, Jonathan Templin, University of Kansas
- EDUC906**, *Item Response Theory*, William P. Skorupski, University of Kansas
- Spring 2017 **EPSY905**, *Multivariate Analysis*, William P. Skorupski, University of Kansas
- Fall 2016 **PSYC887**, *Factor Analysis*, Lesa Hoffman, University of Kansas
- PSYC896**, *Structural Equation Modeling I*, Wei Wu, University of Kansas

## Grant Projects

- 2024 **WE CARE Summer Research Fellowship**
- 2022–2023 **Postdoc Reserach Fellow**, *CLAP@JC*, PI: Steven Sek-yum Ngai, Chinese University of Hong Kong, HK\$77,780,000
- CLAP@JC is a ten-year Trust-initiated Project and a support platform on career and life development (CLD), aiming to foster a sustainable ecosystem by bringing together the education, community and business sectors to smoothen the transition from school to work for all youth. As a postdoc researcher, I've conducted multiple methodology research, i.e., network analysis to unveil interlinks among career and life indicators and psych-social indicators for non-engaged youth
- 2021–2022 **NSF #1751309 (Research Assistant)**, *CAREER: Development of Pedagogical Content Knowledge in Mathematics Among Beginning Teachers*, PI: Yasemin Copur-Gencturk, University of South California, \$629,864
- 2021–2022 **IES R324P210005 (Research Scientist)**, *Research Grants Focused on NAEP Process Data for Learners with Disabilities*, PI: Wei Xin, SRI International; Susu Zhang, University of Illinois, Urbana-Champaign; Jennifer Yu, SRI International, \$699,807

## Internship Experience

- 2021–2022 **Stanford Research Institute International, California**, *Process data analysis and data mining with NAEP data using machine learning*
- The project uses statistic and machine learning techniques to understand the differences in test-taking processes for learners with and without disabilities. As a research scientist, I spent 80% working time conducting statistical analysis for this project and 20% writing manuscripts.
- 2018–2019 **Edmentum™ Test Packs, Kansas**, *Item exposure issues and item exposure strategies for Computerized Adaptive Testing*

## Honors & Awards

- 2021 **Educational Measurement Statistics (EMS) Research Award**, *University of Iowa*
- 2021 **Blommers/Hieronymus/Feldt Fellowship**, *University of Iowa*
- 2013 **Excellent Graduate**, *University of Soochow*
- 2013 **Excellent Bachelor's Thesis**, *University of Soochow*
- 2012 **Scholarship for Outstanding Learning**, *University of Soochow*
- 2011 **People Fellowship Award**, *University of Soochow*

## Publications

\* = First author, first co-author or corresponding author

### Peer-Reviewed Publications

- 2024 **Zhang, J.\***, Templin, J., Xinya, L. (2024)., *Model Selection Posterior Predictive Model Checking via Limited-information Indices for Bayesian Diagnostic Classification Modeling*, Journal of Educational Measurement, <https://doi/10.1111/jedm.12408>
- 2024 **Zhang, J.\***, Cui, S., Xu, Y., Cui, T., Barnhart, W. R., Ji, F., Nagata, J. M., & He, J. (2024)., *Introducing Diagnostic Classification Modeling as An Unsupervised Method for Screening Probable Eating Disorders*, Assessment, <https://doi/10.1177/10731911241247483>
- 2024 Ji, F., **Zhang, J.**, He, J. (2024), *Psychometric network analysis of the Intuitive Eating Scale-2 in Chinese general adults*, Journal of Clinical Psychology, <https://doi.org/10.1002/jclp.23657>
- 2024 Li, J., **Zhang, J.** (2024), *Personality traits and depressive symptoms among Chinese older people: A network approach*, Journal of Affective Disorders, <https://doi.org/10.1016/j.jad.2024.01.215>
- 2023 Lin, Y., Ren, Y., Barnhart, W., Cui, T., **Zhang, J.**, He, J. (2023), *The connections among eating disorder symptomatology, problematic usage of the internet and psychological distress: A longitudinal network analysis in Chinese Adolescents*, International Journal of Mental Health and Addiction (IJMA), Accepted
- 2023 Ngai, S. S., Cheung, C.-K., Zhou, Q., **Zhang, J.**, Ng, Y., Yu, E. N., Zhang, X., & Wong, L. (2023), *Hope, career competency, and social well-being among non-engaged youth in Hong Kong: A longitudinal network analysis*, Current Psychology, Advance online version: <https://doi.org/10.1007/s12144-023-05055-5>
- 2023 Jiang, Z., Han, Y., **Zhang, J.**, Xu, L., Shi, D., Liang, H., Ouyang, J. (2023), *Empirical Ensemble Equating under the NEAT Design Inspired by Machine Learning Ideology*, Methodology. European Journal of Research Methods for the Behavioral and Social Sciences, Methodology, 19(2), 116-132. <https://doi.org/10.5964/meth.10371>
- 2023 Xin, W., Zhang, S., **Zhang, J.**, Jennifer, Y. (2023), *Mathematics performance, response time, and enjoyment of eighth-grade autistic students and their general education peers*, Autism [PSYCHOLOGY SSCI, IF=6.684; SJR=1.617], <https://doi.org/10.1177/13623613231168241>
- 2022 Kazuhiro, Y., **Zhang, J.\*** (2022), *Fully Gibbs Sampling Algorithms for Bayesian Variable Selection in Latent Regression Models*, Journal of Educational Measurement [SSCI, Applied Psychology (Q1)], <http://doi.org/10.1111/jedm.12348>
- 2022 Han, Y, **Zhang, J.**, Jiang, Z., & Shi, D. (2022), *Is the Area Under Curve Appropriate for Evaluating the Fit of Psychometric Models?*, Educational and Psychological Measurement, 83(3), 586-608,<http://doi.org/10.1177/00131644221098182>
- 2022 **Zhang, J.\***, Templin, J., & Mintz, C. E. (2022), *A Model Comparison Approach to Posterior Predictive Model Checks in Bayesian Confirmatory Factor Analysis*, Structural Equation Modeling: A Multidisciplinary Journal, 29(3), 339-349,<https://doi.org/10.1080/10705511.2021.2012682>
- 2022 Ai, J., **Zhang, J.**, Horn, E., Liu, H., Huang, J., & Ma, Y. (2022), *Examination of Chinese Teachers' Attitudes Towards Inclusive Education*, Journal of International Special Needs Education, 25(2), 75-86, doi:<https://doi.org/10.9782/JISNE-D-21-00004>
- 2021 Wang, Y., **Zhang, J.**, & Lee, H. (2021), *An Online Experiment during COVID-19: Testing the Influences of Autonomy Support towards Emotions and Academic Persistence*, Frontiers in Psychology, 12, 4585, <https://doi.org/10.3389/fpsyg.2021.747209>

- 2021 Wang, Y., **Zhang, J.** (2021), *Examining the Relation between Cultural Intelligence and International Students' Academic Performance: A Structure Equation Modeling Analysis*, SCIREA Journal of Sociology, 5(1), 25-52. <https://doi.org/10.54647/sociology84488>
- 2021 Zhang, L., Carter Jr, Richard A., **Zhang, J.**, et al. (2021), *Teacher perceptions of effective professional development: insights for design*, Professional Development in Education, 1-14. <https://doi.org/10.1080/19415257.2021.1879236>
- 2021 Zhang, L., Basham, J. D., Carter Jr, R. A., & **Zhang, J.** (2021), *Exploring Factors associated with the implementation of student-centered instructional practices in US classrooms*, Teaching and Teacher Education, 99, 103273, <https://doi.org/10.1016/j.tate.2020.103273>
- 2021 Qin, Lu, **Zhang, J.** & Liang, X. & Pan, Q. (2021), *R-squared of a Latent Interaction in Structural Equation Model: A Tutorial of Using R*, International Journal of Statistics and Probability, 10(3), 69, <https://doi.org/10.5539/ijsp.v10n3p69>
- 2021 Jiang, Z., Ma, W., Liu, R., Shi, D., & **Zhang, J.** (2021), *Comment on: How sure can we be that a student really failed? On the measurement precision of individual pass-fail decisions from the perspective of Item Response Theory.*, Medical Teacher, 43(5), 607-608, <https://doi.org/10.1080/0142159X.2020.1832207>
- 2018 Jiang, Z., **Zhang, J.**, & Shi, D. (2018), *Particle Swarm Optimization for Diagnosis Task: An Exploratory Study*, International Journal of Intelligent Computing Research, 9(2), 921-927, <https://doi.org/10.20533/ijicr.2042.4655.2018.0111>

### Dissertation

- 2022 **Zhang, J.\***, *Model selection posterior predictive model checking via limited-information indices for Bayesian diagnostic classification modeling*, University of Iowa, <https://doi.org/10.25820/etd.006749>

### Pre-print

- 2022 **Zhang, J.\***, Jiang, Z. (2022), *gTheoryShiny: An online application for interactive G-theory inference*, PsyArXiv, 30 Nov. 2022. Web., <https://10.31234/osf.io/d6mtk>
- 2021 Yamaguchi, K., & **Zhang, J.** (2021), *Fully Gibbs Sampling Algorithms for Bayesian Variable Selection in Latent Regression Models*, PsyArXiv, 30 Dec. 2021. Web., <https://doi.org/10.31234/osf.io/dfrxj>
- 2021 **Zhang, J.\***, Ackerman, T., & Wang, Y. (2021), *2PL Model: Compare Generalized Linear Mixed Model with Latent Variable Model based IRT framework*, PsyArXiv, 30 Dec. 2021. Web., <https://doi.org/10.31234/osf.io/p6wuz>

### Publication Abstract

- 2019 **Zhang, J.\***, Templin, J., Mintz, C., *A Bayesian Saturated Model Approach to Posterior Predictive Model Checks in Confirmatory Factor Analysis*, Multivariate Behavioral Research, DOI:10.1080/00273171.2019.1700773
- 2019 Mintz, C., **Zhang, J.**, & Templin, J., *Assessment of Item Response Model-Data Fit Via Bayesian Limited Information Model Comparison Posterior Predictive Checks*, Multivariate Behavioral Research, <https://doi.org/10.1080/00273171.2019.1700772>

### Software Development

- 2022 **Zhang, J.\***, Jiang, Z., *gtheoryShiny*, <https://psyarxiv.com/d6mtk/>, gTheoryShiny: An online application for interactive G-theory inference  
Web app link: <https://jihongz.shinyapps.io/gTheoryShiny>

- 2020 **Zhang, J.\***, *ggdcm*, <https://github.com/JihongZ/ggdcm>, A package for visualizing DCM models based on ggplot2 package
- 2020 **Zhang, J.\***, Jiang, Z., *BayesNetShiny*, <https://github.com/JihongZ/bayesnetgo>, Interactive BayesNet modeling and visualization
- 2019 **Zhang, J.\***, Jiang, Z., *StanDCM*, <https://github.com/JihongZ/StanDCM>, A package for DCM modeling via Stan

## Conference/Symposium Presentations

- 2024 Chen, J., **Zhang, J.**, Liang, X. (2024, July 21–24), *Variable selection via regularized psychometric factor and network models in multidimensional context*, International Society for Data Science and Analytics (ISDSA) 2024, Vienna, Austria
- 2024 Chen, J., **Zhang, J.**, Liang, X. (2024, July 15–19), *Comparing item selection of regularized factor analysis and network models*, International Meeting of the Psychometric Society (IMPS) 2024, Prague, Czech Republic
- 2024 **Zhang, J.**, & He, J. (2024, June 24–26), *Estimating the group differences of longitudinal network analysis: An example of eating disorder psychopathology*, Modern Modeling Methods Conference (MMM) 2024, Storrs, CT, United States
- 2024 Edeh, E., Liang, X., & **Zhang, J.** (2024, April 11–14), *Ordinal Bayesian SEM with Varied Priors*, National Council for Measurement in Education (NCME) 2024, Philadelphia, PA, United States
- 2023 **Zhang, J.**, & Yurou, W. (2023, May 31 - June 3), *Exploring college students' internalization dynamics during COVID-19: A network analysis*, 8th International Self Determination Theory Conference (SDT), Orlando, Florida, United States  
<https://co2.memberclicks.net/>
- 2022 Yamaguchi, K., & **Zhang, J.** (2022, July 11-15), *Efficient Gibbs Sampling-Based Variable Selection Algorithms for Latent Regression Models*, International Meeting of the Psychometric Society (IMPS) 2022, Bologna, Italy
- 2022 Zhang, S., Xin, W., & **Zhang, J.**, *A Tale of Two Disabilities: Findings from NAEP Response and Process Data*, NCME 2022 Annual Meeting, San Diego, Thursday, April 21 - Sunday, April 24, 2022.
- 2022 Wang, Y., & **Zhang, J.**, *How Math Anxiety influences challenging math problem-solving behaviors under different autonomy support conditions: an experiment*, AERA 2022 Annual Meeting, May, Thursday, April 21-Tuesday, April 26, 2022.
- 2021 **Zhang, J.**, Ackerman, T., Wang, Y., *2PL Model: Compare Generalized Linear Mixed Model with Latent Variable Model based IRT framework*, NCME 2021 Annual Meeting, May, Virtual
- 2020 **Zhang, J.**, Templin, J., Mintz, C., *A Bayesian Saturated Model Approach to Posterior Predictive Model Checks in Confirmatory Factor Analysis*, NCME 2020 Annual Meeting, Virtual
- 2019 Xu G., **Zhang J.**, Zhang M., Zhao Z., Zhao K., *Using LASSO to Identify PISA 2015 Student and Teacher Predictors for Science Achievement*, 2019 Iowa Educational Research and Evaluation Association annual conference, Ankeny, Iowa
- 2019 **Zhang J.**, Templin, J., Mintz, C., *A Bayesian Saturated Model Approach of Posterior Predictive Model Checks in Confirmatory Factor Analysis*, SMEP 2019, Baltimore

- 2019 Mintz, C., Templin, J., & **Zhang J.**, *Assessment of Item Response Model-Data Fit Via Bayesian Limited Information Model Comparison Posterior Predictive Checks*, SMEP 2019, Baltimore
- 2019 Wang, Y., **Zhang, J.**, *Discovering the relationship between Cultural Intelligence and International Students' Academic Performance using Multi-group CFA model*, AERA 2019, Toronto
- 2017 Ai, J., **Zhang, J.**, Liu, H., Huang, J., Horn, E. , *Examining Chinese Professors' Attitudes to Inclusion on the Multidimensional Attitudes towards Inclusive Education Scale-Chinese Translation: A Pilot Study*

## Workshop or Seminar

- 2022 Cassandra Griger, **Jihong Zhang**, *Professional Website Workshop*, <https://github.com/JihongZ/ggdcm>, This session walks through terminology and various resources for building academic professional website. A step-by-step guide for getting started with Github pages will be presented.

## Manuscripts in preparation or under review

- 2024 **Zhang, J.\***, He, J., *The Interplay among Emotion Regulation, Interpersonal Problems, and Eating Disorder Psychopathology in Chinese Adolescents: A Longitudinal Network Analysis*
- 2024 **Zhang, J.\***, Liang, X., *Reliability analysis for psychometric network (TBD)*
- 2024 **Zhang, J.\***, He J., *Computerized adaptive testing for eating disorders (TBD)*
- 2024 **Zhang, J.\***, He J., *Fast Screening: A New Ecological Momentary Assessment based on Diagnostic Classification Modeling (TBD)*
- 2024 **Zhang, J.\***, He J., *Longitudinal network analysis for Tripartite Model based on Ecological Momentary Assessment (TBD)*
- 2024 **Zhang, J.\***, Templin, J., *Model Selection Posterior Predictive Model Checking via Limited-Information Indices for Bayesian Diagnostic Classification Models (TBD)*, Target journal: Journal of Educational Measurement
- 2024 Shi, D., **Zhang, J.**, *The Performance of Bayesian Variable Selection in Linear Regression: Comparing Different Prior Settings (TBD)*

## Journals as Reviewer

- 2023- **The Annals of Applied Statistics**
- 2023- **Children and Youth Services Review**
- 2022- **Structural Equation Modeling: A Multidisciplinary Journal**
- 2022- **Behaviormetrika (BHMK)**
- 2022- **Applied Psychological Measurement (APM)**
- 2022- **Behavior Research Methods (BRM)**, 2023 Outstanding Contributor

## Thesis

- 2022 **Zhang, J.**, *Dissertation: Model Selection Posterior Predictive Model Checking via Limited-Information Indices for Bayesian Diagnostic Classification Models*, Ph.D., University of Iowa
- 2019 **Zhang, J.**, *Thesis: Multidimensional Item Response Theory: Validation study of the Social Capital Rating Scale Among High School Students*, Master, University of Kansas

## Research Projects

- 2022–2022 **Compare Bayesian variable selection and Bayesian shrinkage in Regression Model**  
This project aims to compare the performance of variable selection with the bayesian shrinkage approach such as horseshoe priors and spike-and-slab method.
- 2022–2022 **Fully Gibbs Sampling Algorithms for Bayesian Variable Selection in Latent Regression Model**  
Our team proposed a Bayesian variable selection method with horseshoe and horseshoe+ priors for the latent regression modeling with item response theory. Simulation study and empirical data analysis were provided.
- 2021–2022 **Process data analysis: Using Sequential Clustering to identify behavioral patterns of students**  
The project aims to explore the test-taking behavioral pattern for students during math assessment. We particularly focus on the differences of problem-solving skills among varied disability groups from log data in computerized adaptive testing.
- 2019–2020 **Bayesian Logistic Growth Curve Modeling: Study of Headache Predicted by Emotional States Using Kansas City Hospital Data**  
This project aimed to Bayesian logistic growth curve modeling to predict the frequency of patients' headache and risk factors. The data were collected from the smartphones of participants.
- 2019–2020 **Using LASSO to Identify PISA 2015 Student and Teacher Predictors Science Achievement**  
In this project, we employed regularized regression approach for variables selection which aims to find out the important non-cognitive predictors of students' science achievement. The results were presented on 2019 Iowa Educational Research and Evaluation Association Conference.
- 2018–2019 **Use Tweet Data Mining Method to evaluate educational program**  
With Tweet Data Mining Method, this project aims to analyze students' opinions about lectures, online courses. The programming language would be python.
- 2018–2019 **R Shiny App for the Decision Consistency**  
I built a shiny app aimed to interactively visualize the decision consistency of cut score and Kappa coefficients. See detail at <https://jihongz.shinyapps.io/Cutscore-1>
- 2018–2019 **Longitudinal Hierarchical Linear Model to identify Side Effect of Parental Monitoring on Academic Motivation**  
This proposal aims to use a longitudinal hierarchical linear model to identify Side Effects of Parental Monitoring on Academic Motivation. It was accepted by the 14th Annual KU Professionals for Inclusion and Social Justice Graduate Student Research Conference, February 2, 2018.
- 2017–2018 **TIMSS 2015 Multilevel Confirmatory Factor Analysis and Measurement Invariance Study**  
In this project, I proposed a multilevel CFA model for Trends In Math And Statistics study (TIMMS) science assessment.
- 2016–2017 **Kansas Assessment Program (KAP)**  
The Kansas Assessment Program (KAP) includes a variety of tests aligned to Kansas' content standards, which help educators and policymakers evaluate student learning and meet the requirements for federal and state accountability. My job in this program is to calculate the CTT and make summary reports using R
- 2016–2017 **FlexmirtAutomation Package for R**  
Within this project, I developed a R package called FlexmirtAutomation to run IRT models based on Flexmirt software.
- 2015–2017 **Kansas English Language Proficiency Assessment (KELPA)**  
This project deals with the assessment of English language learners in Kansas using Multidimensional IRT model.

- 2012–2013 **Project Coding of Working Memory supported by National University Undergraduate Student Innovation Foundation, University of Kansas**  
 In this project, I led a cognitive psychological research on revealing the relationship between coding of working memory and selective attention.

## Extra-Curricular Activities

- 2019 **Society of Multivariate Experimental Psychology (SMEP) Poster Session, Baltimore, Oct 9-12**  
 2017 **Attended NCME and AERA, San Antonio, April 28-30**  
 2017 **Attended the Bayesian workshop from CRMDA, University Of Kansas**  
 2016 **Attended the LaTeX workshop from CRMDA, University Of Kansas**  
 2016 **Attended NCME and AERA, Annual Meeting, April 7-11**  
 2016 **Attended APA Conference, Annual Meeting, May 14-18**

## COMPUTER SKILLS

As for research tools, I personally like R language and Python for their flexibility. Sometimes I use MPlus, a popular commercial software for educational and psychological statistics, for specific modeling tasks. If needed, I can use SAS, SPSS or Julia as well.



Other Softwares:

Microsoft Office  
 L<sup>A</sup>T<sub>E</sub>X

STATA  
 EXCEL

SAS

## Languages

Mandarin Native speaker  
 English Proficient