

# Xin Qiao

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## CONTACT INFORMATION

Department of Educational  
& Psychological Studies  
University of South Florida  
Tampa, FL 33620

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## EDUCATION

**Ph.D.** Measurement, Statistics, and Evaluation, University of Maryland, College Park, December 2021

**M.S.** Statistics, Measurement, Assessment, Research Technology, University of Pennsylvania, May 2016

**B.E.** Electronics Engineering, Nanjing University of Posts & Telecommunications, May 2011

## PROFESSIONAL EXPERIENCE

**Assistant Professor** August 2023 - present  
University of South Florida, Educational Measurement and Research

**Postdoctoral Fellow** September 2021 - July 2023  
Southern Methodist University, Department of Education Policy & Leadership  
**Supervisor:** Akihito Kamata

**Psychometric Intern** July 2018 - August 2018  
Educational Testing Service  
**Supervisors:** Usama Ali, Peter van Rijn

## RESEARCH INTERESTS

**Process Data Analysis:** Log data, machine learning, social network analysis

**Latent Variable Modeling:** Item response theory, cognitive diagnostic models, missing data, count data, response time

## JOURNAL ARTICLES

**Qiao, X.**, Kamata, A., & Potgieter, C. (under review). Incorporating Calibration Error in Oral Reading Fluency Scoring. *British Journal of Mathematical and Statistical Psychology*.

Potgieter, C., **Qiao, X.**, Kamata, A., & Kara, Y. (under review). Likelihood Estimation of Model-based Oral Reading Fluency. *Journal of Educational Measurement*.

Sweet, T.M., **Qiao, X.**, Jayasekera, A.S., & Ding, Y. (under review). Investigating Missing Data Treatments for Latent Variable Network Models. *Social Networks*.

**Qiao, X.**, Kamata, A., Kara, Y., Potgieter, C., Nese, J. (under review). Beta-binomial model for count data: An application in estimating model-based oral reading fluency. *Applied Psychological Measurement*.

Kara, Y., Kamata, A., Ozkeskin, E., **Qiao, X.**, Nese, J. (2023). Predicting oral reading fluency scores by between-word silence times using natural language processing and random forest algorithm. *Psychological Test and Assessment Modeling*, 65, 36-54.

Kara, Y., Kamata, A., **Qiao, X.**, Potgieter, C., & Nese, J. (2023). Equating oral reading fluency scores: A model-based approach. *Educational and Psychological Measurement*.

**Qiao, X.**, Jiao, H., & He, Q. (2022). Multiple-group joint modeling of item responses, response times and action counts with the Conway-Maxwell-Poisson distribution. *Journal of Educational Measurement*.

Zhan, P. & **Qiao, X.** (co-first author) (2022). Diagnostic classification analysis of problem-solving competence using process data: An item expansion method. *Psychometrika*, 1-19. <https://doi.org/10.1007/s11336-022-09855-9>

**Qiao, X.** & Jiao, H. (2021). Explanatory cognitive diagnostic modeling incorporating response times. *Journal of Educational Measurement*, 58, 564-585. <https://doi.org/10.1111/jedm.12306>

Scruggs, R., McDermott, P. A., & **Qiao, X.** (2019). A nationwide study of research publication impact of faculty in US higher education doctoral programs. *Innovative Higher Education*, 44, 1-15. <https://link.springer.com/article/10.1007/s10755-018-9447-x>

**Qiao, X.** & Jiao, H. (2018). Data mining techniques in analyzing process data: A didactic. *Frontiers in Psychology*, 9. doi: 10.3389/fpsyg.2018.02231

Liu, J., **Qiao, X.**, Dong, F., & Raine, A. (2018). The Chinese version of the cognitive, affective, and somatic empathy scale for children: Validation, gender invariance and associated factors. *PloS one*, 13(5), e0195268.

BOOK CHAPTERS **Qiao, X.**, Liao, M., & Jiao, H. (2021). Nonlinear latent effects in diagnostic classification modeling incorporating response times. In: Wiberg, M., Molenaar, D., González, J., Böckenholt, U., Kim, J. (Eds.) *Quantitative Psychology: The 85th Annual Meeting of the Psychometric Society, Virtual, 2020*. New York: Springer.

BOOK REVIEWS **Qiao, X.** & Jiao, H. (2018). Review of the book *Bayesian Psychometric Modeling*, by Levy and Mislevy. *Measurement: Interdisciplinary Research and Perspectives*, 16, 135-137.

GRANTS AWARDED Multiple-group Joint Modeling of Item Responses, Response Times, and Action Counts in Collaborative Problem-solving Assessments. *Grant for Graduate Students and Early Career Scholars, American Educational Research Association Division D.*

Role: PI  
Amount: \$5,000

GRANTS  
SUBMITTED

Incorporating Calibration Errors in Latent Factor Scoring with Traditional and Extended Item Response Theory Models.  
*Institute of Educational Science - U.S. Department of Education (August 2024 – July 2027).*

Role: PI  
Amount: \$900,000

Statistical Efficiency in Psychometric Model Calibration: Methods for Small Samples and Large Instruments.  
*Institute of Educational Science - U.S. Department of Education (August 2024 – July 2027).*

Role: Co-PI  
Amount: \$71,586

Extending the Utility of Multi-Informant Assessment Data in School Decision Making: Identification of At-Risk Students through Trifactor Confirmatory Mixture Modeling and Validation of Classification.

*Spencer Foundation Small Research Grant (May 2024-July 2025).*

Role: Co-PI  
Amount: \$49,997

WORKSHOPS

*Using Stan for Bayesian Psychometric Modeling.* National Council on Measurement in Education, April 2022.

PRESENTATIONS

**Qiao, X.**, & Kamata, A., & Potgieter, C.(2023). *Asymptotic Standard Errors of Model-based Oral Reading Fluency Score Equating.* Paper presented at the annual meeting of International Meeting of the Psychometric Society (IMPS), College Park, MD.

**Qiao, X.**, & Kamata, A., & Kara, Y., & Potgieter, C., & Nese, J. (2023). *Beta-binomial model for count data: An application in estimating model-based oral reading fluency.* Paper presented at the annual meeting of Texas Universities' Educational Statistics and Psychometrics (TUESAP), Austin, TX.

Potgieter, C., **Qiao, X.**, & Kamata, A. (2023). *A Quasi-Poisson Testlet Model For Count Data.* Paper presented at the annual meeting of the National Council on Measurement in Education (NCME), Chicago, IL.

**Qiao, X.**, & Sweet, T. M. (2023). *Using Random Walks to Cluster Answer Change Patterns on Interactive Tasks.* Paper presented at the annual meeting of the National Council on Measurement in Education (NCME), Chicago, IL.

**Qiao, X.**, Kamata, A., Larson, E., Wang, K. & Somsong, S. (2023). *Detailed Prosody Report for Oral Reading Fluency Assessment via Machine Learning*. Paper presented at the annual meeting of the National Council on Measurement in Education (NCME), Chicago, IL.

Kara, Y., Kamata, A., Ozkesin, E., & **Qiao, X.** (2023). *Predicting Oral Reading Fluency by Silence Time with Natural Language Processing*. Paper presented at the annual meeting of the National Council on Measurement in Education (NCME), Chicago, IL.

**Qiao, X.**, Jiao, H., & He, Q. (2022, April). *Multiple-Group Joint Modeling of Item Responses, Response Times, and Action Counts with the Conway-Maxwell-Poisson Distribution*. Paper presented at the annual meeting of the American Educational Research Association (AERA), San Diego, CA, United States. (Supported by a grant from AERA Division D)

Jiao, H., Zhou, T., **Qiao, X.**, & Chen, X. (2022, April). *Integrating Cognitive and Non-Cognitive Data to Assess Student Engagement: Bi-Factor Joint Modeling*. Paper presented at the annual meeting of the National Council on Measurement in Education (NCME), San Diego, CA, United States.

**Qiao, X.** & Jiao, H. (2021, July). *Explanatory Cognitive Diagnostic Modeling Incorporating Response Times*. Paper presented at the virtual conference of International Meeting of the Psychometric Society (IMPS).

Ventimiglia, J., **Qiao, X.**, Ding, Y., & Sweet, T. M. (2021, July). *The Impact of Missing Data on Network Inference*. Paper presented at the Networks 2021: A Joint Sunbelt and NetSci Conference, Washington D.C., United States.

**Qiao, X.** & Hicks, J. (2021, June). *A Social Network Analysis of the Answer Change Behavior Using NAEP Process Data*. Paper presented at the annual meeting of the National Council on Measurement in Education (NCME), Baltimore, MD, United States.

**Qiao, X.** (2021, June). *Model-data Fit Evaluation of the Joint Model of Responses and Response Times*. Paper presented at the annual meeting of the National Council on Measurement in Education (NCME), Baltimore, MD, United States.

Jiao, H., **Qiao, X.**, & Lee, J. (2021, June). *Empirical Investigation of Joint Modeling of Responses and Response Times in Testlet-based Linear-on-the-fly Tests (LOFT)*. Paper accepted to present at the annual meeting of the National Council on Measurement in Education (NCME), Baltimore, MD, United States.

**Qiao, X.**, Liao, M., & Jiao, H. (July, 2020). *Nonlinear Latent Effects in Cognitive Diagnostic Modeling Incorporating Response Times*. Paper presented at the virtual conference of International Meeting of the Psychometric Society (IMPS).

Jiao, H. & **Qiao, X.** (July, 2019). *Analyzing Log Files from Multiple Items Using Data Mining Methods*. Invited symposium at the annual conference of International Meeting of the Psychometric Society (IMPS), Santiago, Chile.

**Qiao, X.**, Ali, U., & van Rijn, P. (April, 2019). *An Evaluation of Hierarchical Models Relating Item Response Format, Accuracy, and Speed*. Paper presented at the annual meeting of the National Council on Measurement in Education (NCME), Toronto, Ontario, Canada.

**Qiao, X.** (April, 2018). *Impact of Nonignorable Missing Data on the Performance of Person Fit Statistic*. Paper presented at the annual meeting of the National Council on Measurement in Education (NCME), New York City, NY, United States.

Scruggs, R., McDermott, P. A., & **Qiao, X.** (April, 2018). *A Nationwide Study on Research Publication Impact of Faculty in American Higher Education*. Paper presented at the annual meeting of the American Educational Research Association (AERA), New York City, NY, United States.

INVITED TALKS *Diagnostic Classification Analysis of Process Data*. Department of Psychology, University of Illinois at Urbana-Champaign, Champaign, IL, September 2022.

TEACHING Instructor, EDF7408 Statistical Analysis for Educational Research II, University of South Florida, Fall 2023

Co-instructor, EDU7312 Quantitative Statistics for Educational Research II, Southern Methodist University, Spring 2022

Co-instructor, EDU7311 Quantitative Statistics for Educational Research I, Southern Methodist University, Fall 2022

AWARDS **Herb and Libby Ware Graduate Student Award** 2021  
University of Maryland, College Park

**Jacob K. Goldhaber Travel Award** 2019  
University of Maryland, College Park

**International Conference Student Support Award** 2018  
University of Maryland, College Park

**HDQM Graduate Student Travel Award** 2018  
University of Maryland, College Park

PROFESSIONAL  
SERVICE

**Professional Memberships:**

National Council on Measurement in Education  
American Educational Research Association  
Psychometric Society

**Ad Hoc Reviewer:**

Behavior Research Methods  
Frontiers in Psychology  
AERA Open  
Psychological Test and Assessment Modeling

**Grant Reviewer:**

National Science Foundation - Methodology, Measurement & Statistics

**Committee Member:**

2021 Brenda H. Loyd Outstanding Dissertation Award Committee Student Representative

COMPUTING  
SKILLS

flexMIRT, Mplus, R, Python, SPSS, SAS, BUGS, L<sup>A</sup>T<sub>E</sub>X.