XINGYAO (DORIA) XIAO

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EDUCATION

University of California, Berkeley Berkeley, USA

Ph.D. in Social Research Methodologies, GPA: 4.00/4.00 08/2020 - 05/2025

- Research Areas: Bayesian Longitudinal and latent variable Modelling, Growth Mixture Modeling, Model Selection, Multidimentional Item Response Theory (mIRT), Many-Facet Rasch Model (MFRM), and Integration of AI in Education

Boston College Boston, USA

M.S. in Applied Statistics and Psychometrics, GPA: 3.88/4.00, Major GPA: 4.00/4.00 08/2018 - 05/2020

- Scholarship: Dean's Merit Scholarship (07/2018 & 08/2019)

University of Minnesota, Morris Morris, USA

B.A. in Statistics, Minor in Mathematics: GPA: 3.82/4.00, Major GPA: 4.00/4.00 01/2016 - 09/2018

- Honors: Graduated with Distinction, Project Stipend, Outstanding Performance Award, Dean's List

PUBLICATIONS

Submitted/ Under Review

[1] Li, Z. & **Xiao, X.** * (2025). Which Countries are More Meritocratic? Individual- and Country-level Patterns of Meritocratic Beliefs. *Manuscript submitted for publication.*

[2] Xue, M., **Xiao, X.**, Liu, Y., & Wilson, M. (2025). On the Consistency of Automatic Scoring with Large Language Models. *Manuscript submitted for publication.*

[3] Xue, M., **Xiao, X.**, Liu, Y., & Wilson, M. (2025). Extract Information from Process Data Using the Transformer. *Manuscript submitted for publication.*

[4] **Xiao, X.** * & Cheng, Y. (2024). Different Genders, Different Paths to Self-Efficacy: An Analysis of the Moderating and Mediating Effects of Environmental Factors on the Relationship between Gender and Self-Efficacy. *Manuscript submitted for publication.*

[5] **Xiao, X.** *, Li, Z., Liu, Y., & Cheng, Y. (2024). Identifying sensitive periods for the impact of physical abuse on psychopathology symptoms. *Manuscript submitted for publication.*

Accepted/Published

[6] **Xiao, X.**, Rabe-Hesketh, S., & Skrondal, A. (2025). Bayesian identification and estimation of growth mixture models. *Psychometrika*. https://doi.org/10.1017/psy.2025.11

[7] Xue, M., Liu, Y., **Xiao, X.** & Wilson, M. (2025). Automatic prompt engineering for automatic scoring. *Journal of Educational Measurement*. https://doi.org/10.1111/jedm.70002

[8] **Xiao, X.** *, Patz, R., & Wilson, M. (2025). Integration of machine learning and human rater Scores with Many Facet Rasch Model. *British Journal of Mathematical and Statistical Psychology.* Accepted with minor revisions.

[9] Su, B., **Xiao, X.** *, Cheng, Y., Liu, C., & Yang, C. (2025). Trajectories of depressive symptom among college students in China during the COVID-19 pandemic: Association with suicidal ideation and insomnia symptoms. *Suicide and Life-Threatening Behavior.* (In press)

[10] Cheng, Y., **Xiao, X.,** Jackson, D., Shah, S. A., Abdus-Sabur, F., Hira, A., ... & Barnett, M. (2025). Competent but Anxious Smart Greenhouse Makers: Findings from a Physical Computing Project. *Journal of Science Education and Technology*, 1-19.

[11] Wang, F., Zhu, X., Pi, L., **Xiao, X.**, & Zhang, J. (2024) Patterns of participation and performance at the class level in English online education: A longitudinal cluster analysis of online K-12 after-school education in China. *Education and Information Technologies, 29,* 15595–15619. https://doi.org/10.1007/s10639-024-12451-2

[12] Ma, J., Shen, Z., Wang, N., **Xiao, X.**, & Zhang, J. (2023). Developmental differences in children's adaptation to vehicle distance and speed in street-crossing decision-making. *Journal of Safety Research, 88,* 261-274. https://doi:10.1016/j.jsr.2023.11.013

[13] Zhang, J., Liu, F., Chen, Z., Yu, Z., **Xiao, X.**, Shi, L., & Guo, Z. (2023). A multi-level analysis on the causes of train-pedestrian collisions in Southwest China 2011–2020. *Accident Analysis & Prevention, 193,* 107332. https://doi.org/10.1016/j.aap.2023.107332

[14] **Xiao, X.** *, Xue, M., Cheng, Y. (2023). Bayesian partial credit model and its applications in science education. In: Liu, X., Boone, W.J. (eds) Advances in Applications of Rasch Measurement in Science Education. Contemporary Trends and Issues in Science Education, vol 57. Springer, Cham. https://doi.org/10.1007/978-3-031-28776-3_4

[15] **Xiao, X.**, Ji, F. & Rabe-Hesketh, S. (2022). Introduction to multilevel logistic regression using rstanarm. *Stan Case Study*. https://education-stan.github.io/tutorial_glmm.html

[16] **Xiao, X.** * & Cheng, Y. (2021). Movie title keywords: A text mining and exploratory factor analysis of popular movies in the United States and China. *Journal of Risk and Financial Management*, *14*(2). https://doi.org/10.3390/jrfm14020068

[17] Kim, J. M., **Xiao, X.**, & Kim, I. (2020). Hollywood movie data analysis by social network analysis and text mining. *International Journal of Electronic Commerce Studies*, 11(1), 75-92. https://doi.org/10.7903/ijecs.1731

[18] Kim, J. M., Lee, N, & **Xiao, X.** (2019). Directional dependence between major cities in China based on copula regression on air pollution measurement. *PLoS ONE* 14(3), e0213148. https://doi.org/10.1371/journal.pone.0213148

Note. * Corresponding author

RESEARCH EXPERIENCE

LEVANTE Project, Graduate School of Education & Department of Psychology Palo Alto, USA
Postdoctoral Scholar 07/2025 – Present

- Working under Prof. Ben Domingue and Prof. Nilam Ram on developmental change and psychometrics research.
- Focus on measurement invariance, growth modeling, and statistical methods for modeling behavioral and developmental change.
- Contributing to research design, Bayesian modeling, and engagement within Stanford's behavioral science and education research communities.
- Collaborative project supported by the Jacobs Foundation with international sites including the U.S., Canada, Colombia, and Germany.

Influence Score Chat Project, The Munathara Initiative Online
Lead Researcher 03/2025 – 07/2025

- Led the development of AI-powered metrics to assess the vibrancy, inclusiveness, and health of public discourse in Tunisia and Lebanon.
- Designed and implemented a mixed-methods data collection strategy integrating qualitative fieldwork and large-scale social media analytics.
- Applied natural language processing (NLP) and machine learning to model sentiment, polarization, and narrative diversity across multiple media sources.
- Collaborated with regional researchers for contextual interpretation and partnered with developers to visualize key findings on an interactive web platform.

Berkeley Evaluation and Assessment Research (BEAR) Center, UC Berkeley Berkeley, USA
Graduate Student Researcher 11/2020 – 01/2025

- AI Integration for Scoring: Assisted in integrating machine learning models with human rater scores for open-ended items.
- Rater Assignment Optimization: Contributed to research on training sample sizes and rater assignment strategies to optimize MFRM.
- Measurement Invariance: Applied mIRT and differential item functioning (DIF) to detect bias and improve assessment precision.
- Collaborative Research: Facilitated team meetings, coordinated contributions to publications, and supported task prioritization.

Education Research using Stan, Berkeley, USA
Graduate Student Researcher (Bayesian Modeling) 11/2020 - 01/2025

- Tutorial Development: Created accessible tutorial on multilevel logistic regression using rstanarm.
- Identifiability Diagnostics: Identified convergence issues in Bayesian growth mixture models by developing code-based and visual diagnostics for identifiability problems and proposing solutions through careful prior selection.

Edmentum, Remote Engagement Online
Summer Intern 06/2023 - 08/2023

- AI Transadaptation: Assessed the quality of GPT-generated translations using a mixed-method approach, combining algorithmic analysis with human reviews.
- Benchmarking & Evaluation: Compared AI translations with human translations to evaluate linguistic accuracy and contextual relevance.

Chinese Academy of Sciences, Institute of Psychology Beijing, China
Statistical Modeling Consultant 06/2022 - 04/2023

- Statistical Consultation: Provided guidance on advanced R-based statistical models, supporting research teams in applying appropriate techniques.
- Research Collaboration: Contributed to research projects by refining methodologies and enhancing data analysis, helping improve the robustness and clarity of findings.

California Computer Science Project (CCSP), Berkeley Berkeley, USA
Graduate Student Researcher 11/2020 - 01/2022

- Instructional Design: Helped develop computer science instructional materials in collaboration with educational specialists to support leadership in California public schools.
- Community Engagement: Contributed to outreach strategies to engage diverse educational communities.

City Connects: Mary E. Walsh Center for Thriving Children at Boston College Boston, USA
Graduate Research Assistant 08/2019 - 07/2020

- Research & Analysis: Assisted in data collection, statistical analysis (regression, multivariate techniques), and report preparation for evaluating educational intervention programs, providing actionable insights to stakeholders.

Innovation in Urban Science Education Lab Boston, USA
Data Analyst 05/2019 - 06/2020

- Qualitative Analysis: Conducted and analyzed qualitative data from cognitive interviews for STEM education programs, providing insights into program effectiveness.
- AI Inventory Development: Assisted in developing AI Concept Inventories using psychometric analyses to measure STEM understanding.

Research Service at Boston College Boston, USA
Statistical Research Consultant 02/2019 - 06/2019

- Statistical Consulting: Provided statistical analysis and guidance to researchers and faculty, assisting with data interpretation, results dissemination, and application of best practices.

TEACHING EXPERIENCE

Graduate Student Instructor, University of California, Berkeley

- **Hierarchical and Longitudinal Modeling** (Fall 2021, 2022, 2023).
- **Data Analysis in Education Research II** (Spring 2022, 2023).
  - Supported instruction of graduate-level courses on advanced statistical methods and quantitative research techniques.
  - Facilitated lab sessions with hands-on exercises, guiding students in applying statistical methods to real-world problems.
  - Provided individualized feedback on assignments and research projects, helping students develop analytical skills and confidence in using statistical modeling.

Teaching Assistant, Boston College

- **Intermediate Statistics** (Spring 2020).
- **Statistics I** (Fall 2019).
  - Encouraged collaborative learning through group projects, fostering peer engagement and deeper understanding of course material.

Teaching Assistant, University of Minnesota, Morris

- **Introduction to Statistics** (Fall 2017).

- Assisted in teaching foundational statistical concepts and applications.

AWARDS & GRANTS

- Dissertation Completion Fellowship: $30,000 (2024-2025), Berkeley School of Education, UC Berkeley.
- Continuing Student Fellowship Award: $8,000 (2022-2024), Berkeley School of Education, UC Berkeley.
- Psychometric Society Travel Award: IMPS 2023, sponsored by EdAstra Tech.
- Barbara White Bequest Competition Award: $3,300, Berkeley School of Education, UC Berkeley.
  - Xiao, X. (2021). *Using Item Response Theory to critique, develop, and validate concept inventories in STEM education.*

PROFESSIONAL SERVICE

- Editorial Board Member: Measurement: Interdisciplinary Research and Perspectives (Taylor & Francis), 2025–Present
- Conference Reviewer and Chair: 2024 National Council on Measurement in Education (NCME).
- Manuscript Reviewer: Measurement: Interdisciplinary Research and Perspectives, May 2023.

TECHNICAL SKILLS

R, Stata, SPSS, Mplus (statistical modeling, data management, visualization); Stan (Bayesian modeling); Shiny (interactive web applications); Python (machine learning, automation); SQL (database management).

CONFERENCE PRESENTATIONS

National Council on Measurement in Education (NCME):

- **2025**
  - [1] Xiao, X., Patz, R., & Wilson, M. *Integration of machine learning and human rater scores using the many-facet Rasch model.* Denver, CO, USA.
  - [2] Xiao, X., Gochyyev, P., & Wilson, M. *Comparing the difficulty of selected-response and constructed-response items.* Denver, CO, USA.
- **2024**
  - [3] Xiao, X., Razavi, P., & Powers, S. *Bridging bilingual gaps: An in-depth exploration of ChatGPT's transadaptation capabilities.* Philadelphia, PA, USA.
  - [4] Xiao, X., Patz, R., & Wilson, M. *Designing scoring reliability and instructional support into classroom-based math assessments.* Philadelphia, PA, USA.
- **2023**
  - [5] Xiao, X. *Bayesian comparison of Growth Mixture Models.* Chicago, IL, USA.
- **2022**
  - [6] Xiao, X. *Bayesian Growth Mixture Models for classifying and measuring individual trajectories.* San Diego, CA, USA.

American Educational Research Association (AERA)

- **2023**
  - [7] Xiao, X., Rabe-Hesketh, S., & Cheng, Y. *Bayesian comparison of Growth Mixture Models: To better pursue truth.* Chicago, IL, USA.

International Meeting of the Psychometric Society (IMPS)

- **2025**
  - [8] Xiao, X., Rabe-Hesketh, S. *When Model Evaluation Fails in Growth Mixture Models: Diagnostic and Comparative Perspective.* Minneapolis, MN, USA.
- **2023**
  - [9] Xiao, X., Rabe-Hesketh, S. *Bayesian model evaluation and local identifiability for Growth Mixture Models.* College Park, MD, USA.
  - [10] Xiao, X., Ji, F., & Ernst, A. *Sample heterogeneity in dynamic psychological processes.* College Park, MD, USA.

Royal Statistical Society International Conference

- **2024**
  - [11] Xiao, X., Rabe-Hesketh, S., & Skrondal, A. *Bayesian approaches to identifiability and estimation of Growth Mixture Models.* Brighton, United Kingdom.

StanCon

- **2024**

[12] Xiao, X., Rabe-Hesketh, S., & Skrondal, A. *Bayesian identification estimation and diagnostic techniques for Growth Mixture Models using Stan.* Oxford, United Kingdom.

Modern Modeling Methods (M3) Conference

- **2023**

[13] Xiao, X. *Bayesian model evaluation using marginal likelihood for Growth Mixture Models.* Storrs, CT, USA.

[14] Xiao, X., Ji, F. *Sample heterogeneity in dynamic psychological processes.* Storrs, CT, USA.

Other Conferences

- **2022**

[15] Xiao, X., Li, Y., & Park, Y. *Automating book-to-curriculum mapping using representation learning.* Association for Education Finance & Policy 47th Annual Conference, Denver, CO, USA.

- **2019**

[16] Xiao, X. *Directional dependence between major cities in China based on copula regression on air pollution measurements*. Southern Regional Council on Statistics 2019, Carrolton, KY, USA.

[17] Xiao, X. *Investigation of the psychometric characteristics of Taylor Manifest Anxiety Scale (TMAS).* New England Educational Research Organization 2019, Portsmouth, NH, USA.

- **2018**

[18] Xiao, X. *Visualizing statistical data on United States agriculture.* Undergraduate Research Symposium 2018, Twin Cities, MN, USA.