YICHI ZHANG

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WORK EXPERIENCE

Researcher Sep 2024 - Present
American Institutes for Research Arlington, Virginia
- First-authored research reports examining methodological issues in large-scale educational assessments
- Presented research findings at 10+ national and international conferences
- Mentored research assistants in research projects, providing guidance on methodology, data analysis, and professional development

EDUCATION

University of Southern California 2019-2024
Ph.D. in Quantitative Methods and Computational Psychology (GPA: 3.97)
Dissertation: Bayesian Region of Measurement Equivalence (ROME) for establishing measurement invariance
Chair: Hok Chio (Mark) Lai, Ph.D.

University of Southern California 2019-2021
Master of Arts in Quantitative Methods and Computational Psychology (GPA: 4.00)
Thesis: Evaluating two small sample corrections for fixed-effects standard errors and inferences in multilevel models with heteroscedastic, unbalanced, clustered Data
Chair: Hok Chio (Mark) Lai, Ph.D.

Dickinson College 2015-2019
Bachelor of Science in Mathematics and Psychology (GPA: 3.79)

PUBLICATIONS

Published Manuscript

Lai, M. H. C., **Zhang, Y.,** Ozcan, M., Tse, W. W.-Y., Miles, A. (2025). fMACS: Generalizing dMACS effect size for measurement noninvariance with multiple groups and multiple grouping variables. Structural Equation Modeling: A Multidisciplinary Journal. Advance online publication. https://doi.org/10.1080/10705511.2025.2484812

Lai, M. H. C., **Zhang, Y.,** & Ji, F. (2024). Adjusting for measurement error in cluster means in multilevel modeling: Two numerically stable alternatives to latent-mean centering. *Multivariate Behavioral Research*. Advance online publication. https://doi.org/10.1080/00273171.2024.2307034

Zhang, Y., & Lai, M. H. C. (2024). Evaluating two small-sample corrections for fixed-effects standard errors and inferences in multilevel models with heteroscedastic, unbalanced, clustered data. *Behavior Research Methods*. Advance online publication. https://doi.org/10.3758/s13428-023-02325-9

Ozturk, E. D., **Zhang, Y.**, Lai, M. H. C., Sakamoto, M. S., Chanfreau-Coffinierd, C., & Merritt, V.C. (2023). Measurement invariance of the Neurobehavioral Symptom Inventory (NSI) in male and female Million Veteran Program (MVP) enrollees completing the Comprehensive Traumatic Brain Injury Evaluation (CTBIE). *Assessment*. Advance online publication. https://doi.org/10.1177/10731911231198214

Tse, W. W., Lai, M. H. C., & **Zhang, Y.** (2023). Does strict invariance matter? Valid group mean comparisons with ordered-categorical items. *Behavior Research Methods*. Advance online publication. https://doi.org/10.3758/s13428-023-02247-6

Zhang, Y., Kim, Y., & Zheng, X. (2023). Investigating measurement invariance in NAEP student questionnaire index items. [AIR-NAEP Working Paper]. Washington, DC: American Institutes for Research.

Zhang, Y., Lai, M. H. C., & Palardy, G. J. (2023). A Bayesian region of measurement equivalence (ROME) approach for establishing measurement invariance. *Psychological Methods, 28*(4), 993–1004. https://doi.org/10.1037/met0000455

Lai, M. H. C., & **Zhang, Y.** (2022). Classification accuracy of multidimensional tests: Quantifying the impact of noninvariance. *Structural Equation Modeling, 29*(4), 620–629. https://doi.org/10.1080/10705511.2021.1977936

Manuscript Under Review

Zhang, Y., & Lai, M. H. C. (2024). Bayesian region of measurement equivalence (ROME) approach with alignment.

Manuscript In Preparation

Zhang, Y., & Wolfe, E. W. (2024). Evaluating subgroup analysis indices and guidelines for automated scoring algorithm.

Book Chapters

Zhang, Y., Tse, W. W., & Lai, M. H. C.(2024). Bootstrap Methods for Robust Multilevel Analysis. In M. Stemmler, W. Wiedermann, & F. L. Huang (Eds.), *Dependent Data in Social Sciences Research: Forms, Issues, and Methods of Analysis* (2nd ed.). Springer. https://doi.org/10.1007/978-3-031-56318-8_13

RESEARCH INTERNSHIPS

Psychometrics Research Intern May 2023 - Jul 2023
Pearson Iowa city, Iowa
- Designed and implemented a simulation study to examine the performance of reliability indices for automated scoring algorithm using a Monte Carlo simulation
- Submitted and presented research findings of algorithm validity at the 2024 National Council on Measurement in Education (NCME) conference

Doctoral Research Intern Jun 2022 — Aug 2022
American Institutes for Research Arlington, Virginia
- Applied a Bayesian methodology to validate survey items from a large-scale national educational assessment data set with Balanced Incomplete Block design (NAEP)
- Presented findings at the 2023 National Council on Measurement in Education (NCME) conference

RESEARCH EXPERIENCE

Research Assistant Aug 2020 - Aug 2021
University of Southern California Los Angeles, California

Grant: *Evaluation of "Identity-Based Motivation Journey to Academic Success" (Department of Education/i3; Supervisor: Lai, M. H. C.)*

- Evaluated longitudinal measurement invariance of early assessments of college readiness across intersectional groups and cohorts using two national datasets (ELS:2002; HSLS:2009)

Grant: *Developing and Validating Early Assessments of College Readiness: Differential Effects for Underrepresented Groups, Optimal Timing of Assessments, and STEM-specific Indicators (National Science Foundation, Research on Learning in Formal and Informal Settings; Supervisor: Palardy, G. J.)*

- Conducted attrition analysis and reliability analysis for a large-scale longitudinal dataset that assessed the efficacy of a digital program developed to improve academic outcomes by changing identity-based motivation

CONFERENCE PRESENTATIONS

14. **Zhang, Y.,** & Lai, M. H. C. (2025, April 23-26). *Bayesian Region of Measurement Equivalence (ROME) Framework With Multilevel Confirmatory Factor Analysis* [Poster Session]. The National Council on Measurement in Education (NCME), Dever, Colorado.

13. **Zhang, Y.,** & Wolfe, E. W. (2024, April 11-14). *Evaluating subgroup analysis indices and guidelines for automated scoring algorithm* [Poster session]. The National Council on Measurement in Education (NCME), Philadelphia, Pennsylvania.

12. **Zhang, Y.,** & Lai, M. H. C. (2023, July 25-28). *Alignment with Bayesian Region of Measurement Equivalence (ABROME) approach for multiple groups comparisons* [Oral Presentation]. Annual Meeting of the Psychometric Society (IMPS), College Park, Maryland.

11. **Zhang, Y.,** Kim, Y., & Zheng, X. (2023, April 12-15). *Investigating measurement invariance in NAEP student questionnaire index items* [Oral Presentation]. The National Council on Measurement in Education (NCME), Chicago, Illinois.

10. Lai, M. H. C., **Zhang, Y.,** & Ji, F. (2023, April 13-16). *An empirical Bayes cluster-mean approach to correct for sampling error in between-cluster effects* [Poster session]. American Educational Research Association Annual Meeting (AERA), Chicago, Illinois.

9. **Zhang, Y.,** & Lai, M. H. C. (2022, July 11-15). *Bayesian Region of Measurement Equivalence approach with Alignment* [Oral Presentation]. Annual Meeting of the Psychometric Society (IMPS), Bologna, Italy.

8. **Zhang, Y.,** & Lai, M. H. C. (2022, July 11-15). *Evaluating standard error estimators on small clustered samples with heteroscedasticity* [Poster session]. Annual Meeting of the Psychometric Society (IMPS), Bologna, Italy.

7. **Zhang, Y.,** & Lai, M. H. C. (2022, April 21-26). *Evaluating standard error estimators on small clustered samples with heteroscedasticity and unbalanced cluster sizes* [Poster session]. American Educational Research Association Annual Meeting, San Diego, CA, United States.

6. Palardy, G. J., **Zhang, Y.,** & Lai, M. H. C. (2022, April 21-26). *Measurement invariance testing via the Alignment method: Intersectional grouping and multiple cohorts* [Oral Presentation]. American Educational Research Association Annual Meeting, San Diego, CA, United States.

5. **Zhang, Y.,** & Lai, M. H. C. (2021, July 20-23). *Classification accuracy of multidimensional tests: Quantifying the impact of noninvariance* [Oral Presentation]. Virtual conference of the Psychometric Society (IMPS) due to covid-19.

4. Zhang, R., **Zhang, Y.**, & Lalonde, R. (2021, July 27-31). *Examining multiculturalism-creativity link from the perspective of challenge and threat appraisals* [Oral Presentation]. International Association of Cross-Cultural Psychology (IACCP), online.

3. **Zhang, Y.,** & Lai, M. H. C. (2021, August 12-14). *Classification accuracy of multidimensional tests: Quantifying the impact of noninvariance* [Poster Session]. American Psychological Association Annual Convention (APA), Online.

2. **Zhang, Y.,** & Lai, M. H. C. (2020, July 14-17). *A Bayesian Region of Measurement Equivalence (ROME) approach for establishing measurement invariance* [Poster Session]. Annual Meeting of the Psychometric Society (IMPS), College Park, MD, United States.

1. **Zhang, Y.,** & Lai, M. H. C. (2020, June 2-3). *A Bayesian Region of Measurement Equivalence (ROME) approach for establishing measurement invariance* [Poster Session]. Modern Modeling Methods Conference (MMM), Storrs, CT, United States. (Conference canceled)

INVITED PRESENTATIONS

How Accurate are the Decisions Suggested by Score Agreement Guidelines for Automated Scores? July 2023
Pearson

Multilevel Regression and Poststratification on Social Media Data July 2023
Pearson

Dealing with Missing Data in R March 2023
University of Southern California

Measurement Invariance Testing in R Nov 2023
University of Southern California

Investigating Measurement Invariance in NAEP Student Questionnaire Index Items
American Institutes for Research July 2022

A Bayesian Region of Measurement Equivalence (ROME) Approach for Establishing Measurement Invariance July 2022
American Institutes for research

TEACHING EXPERIENCE

Statistical Consultant Aug 2022 - May 2023
McArdle Graduate Consultation and Computer Center (USC) Los Angeles, CA

- Translated graduate students' needs into appropriate statistical solutions using both frequentist and Bayesian frameworks
- Hosted workshop sessions on multilevel models and structural equation models
- Mentored graduate students in statistical analysis
- Provided software support for using R, Mplus, Stata

- Contributed to the development of a website that gathers learning resources and manages appointment requests

Teaching assistant **Aug 2020 — May 2023**
University of Southern California Los Angeles, CA
- PSYC 274 Lg: Statistics (Evaluation: 3.48) and PSYC 100 Lg: Introduction to Psychology (Evaluation: 3.45)
- Led lab sections of 50 students, planned lessons and activities
- Taught inferential statistics with SPSS and R

Co-instructor of Workshop "Advancing Quantitative Carlo Simulation" **Aug 2020**
Science with Monte Simulation Summer School, Psychology Postgraduate Affairs Group, the British Psychological Society *Online*

SOFTWARE DEVELOPMENT

2022 NISS Data Visualization Contest
https://uncover-data-stories.shinyapps.io/NAEP-Reading-Scores/
- Shiny App that visualizes the trend of the National Assessment of Educational Progress (NAEP) reading scale scores from 1998 to 2019

Unbiasr Shinyapp
https://mmmlabusc.shinyapps.io/partinvshinyui/
- Shiny App that implements the multidimensional classification accuracy analysis (MCAA) framework that quantifies the impact of item bias on selection accuracy

PROFESSIONAL SERVICE

Ad Hoc Reviewer Jan 2020 - Present
- Psychological Methods
- Multivariate Behavioral Research
- Asian American Journal of Psychology
- American Educational Research Association Annual Meeting (AERA)

PROFESSIONAL DEVELOPMENT WORKSHOPS AND COURSES

Advanced Process Data Analytics using NAEP
Introduction to flexMIRT by Li Cai, Michael Edwards and Carrie R. Houts
Longitudinal Data Analysis Using SEM by Paul D. Allison
Introduction to Social Network Analysis by Tracy Sweet

SKILLS

Tools and Languages
R(mirt, ltm, lavaan, brms, lme4), Mplus, Python, Julia, Stata, Stan, SPSS, Tensorflow, Git, LaTeX, MarkDown, Rsweave
Psychometrics
Calibration, Linking, Equating, Computer adaptive testing, Reliability and validity analysis, Classical Test Theory, Generalizability theory, Item Response Theory, Sampling and weighting, Causal inference, Bootstrap methods, Categorical data analysis, Robust statistics
Quantitative Research
Selection and assessment, Machine Learning, Natural Language Processing, Decision science and behavior change, Quantitative text analysis, Survey design, Experiment design

AWARDS AND SCHOLARSHIPS

Society for the Improvement of Psychological Science Diversity Travel Grant	2024
Dornsife Ph.D. Academy Certificate in Communication, Leadership and Management	2023
Graduate Student Government Professional Development Fund	2022-2023
Dornsife PhD Academy Scholarship and Research Fund Award	2019-2024
USC Psychology Department Travel Grant Award	2019-2023