

YICHI ZHANG

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Los Angeles, California

EDUCATION

- University of Southern California** 2019-Expected May 2024
Ph.D. in Quantitative Methods and Computational Psychology (GPA: 3.96)
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 Standard Error Estimators for Multilevel Models on Small Samples With Heteroscedasticity and Unbalanced Cluster Sizes
Chair: Hok Chio (Mark) Lai, Ph.D.
- Dickinson College** 2015-2019
Bachelor of Science in Mathematics and Psychology (GPA: 3.79)

RESEARCH INTEREST

Measurement invariance/ differential item functioning
Bayesian statistics
Robust methods for multilevel models
Machine learning for psychological and educational research

RESEARCH INTERNSHIP

- Psychometrics Research Intern** May 2023 - Jul 2023
Pearson Iowa city, Iowa
- Examined the performance of reliability indices for automated scoring algorithm using a Monte Carlo simulation
- Submitted a full research paper to 2024 National Council on Measurement in Education (NCME) conference
- Doctoral Research Intern** Jun 2022 — Aug 2022
American Institutes for Research Arlington, Virginia
- Validated survey items from a large-scale educational assessment data set with complexed design (NAEP) using the developed Bayesian ROME approach in R
- Presented the paper at 2023 National Council on Measurement in Education (NCME) conference

PUBLICATIONS

Published Manuscript

Zhang, Y., Lai, M. H. C., & Palardy, G. J. (2022). 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>

Lai, M. H. C., **Zhang, Y.**, & Ji, F. (Accepted pending minor revision). Adjusting for measurement error in cluster means in multilevel modeling: Two numerically stable alternatives to latent-mean centering. *Multivariate Behavioral Research*.

Ozturk, E. D., **Zhang, Y.**, Lai, M. H. C., Sakamoto, M. S., Chanfreau-Coffinierd, C., & Merritt, V.C. (Accepted on 07/28/2023). 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*.

Tse, W. W., Lai, M. H. C., & **Zhang, Y.** (Accepted on 09/18/2023). Does Strict Invariance Matter? Valid Group Mean Comparisons with Ordered-Categorical Items. *Behavior Research Methods*.

Manuscript Under Review

Zhang, Y., & Lai, M. H. C. (2022). Evaluating Standard Error Estimators for Multilevel Models on Small Samples With Heteroscedasticity and Unbalanced Cluster Sizes [First round revised and resubmitted; submitted to *Behavior Research Methods*].

Manuscript In Preparation

Zhang, Y., & Lai, M. H. C. (2022). Bayesian region of measurement equivalence (ROME) approach with Alignment [Expected submission date: 12/01/2023].

Book Chapters

Zhang, Y., Tse, W. W., & Lai, M. H. C. (2022). Bootstrap methods for multilevel data when asymptotic distributional assumptions are not tenable. In M. Stemmler, W. Wiedermann, & F. L. Huang (Eds.), *Dependent Data in Social Sciences Research: Forms, Issues, and Methods of Analysis* (2nd ed.). Springer. [Under review]

CONFERENCE PRESENTATIONS

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 for Multi-level Models on Small 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
<i>Pearson</i>	
Multilevel Regression and Poststratification on Social Media Data	July 2023
<i>Pearson</i>	
Dealing with Missing Data in R	March 2023
<i>University of Southern California</i>	
Measurement Invariance Testing in R	Nov 2023
<i>University of Southern California</i>	
Investigating Measurement Invariance in NAEP Student Questionnaire Index Items	

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 support for using R, Mplus, Stata

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 statistical tests 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://mmlabusc.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)

RELEVANT COURSEWORK

Statistics

Research Design in Developmental Psychology, Fundamentals of Psychological Measurement, Advanced Statistical Computing, Risk Analysis, Multilevel Modeling, Bayesian Data Analysis, Data Analysis for

Categorical Variables, Introduction to the Theory of Statistics, Classic and Modern Statistic Methods, Risk Analysis

Machine Learning and NLP

Applied Machine Learning, Computational social sciences: Text as Data

Consulting

Statistical Problem Solving

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, Python, Julia, Stata, Stan, Mplus, Tensorflow, Git, LaTeX, Markdown, Rswave

Quantitative Research

Measurement, selection and assessment, Statistical Modeling, decision science and behavior change, quantitative text analysis, survey design, experiment design

AWARDS AND SCHOLARSHIPS

Graduate Student Government Professional Development Fund	2022-2023
Dornsife PhD Academy Scholarship and Research Fund Award	2019-2023
USC Psychology Department Travel Grant Award	2019-2023