Curriculum Vitae
Keke Lai

Psychological Sciences
University of California at Merced
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Academic Positions

University of California at Merced

- Associate Professor of Quantitative Psychology; 2021 – present

- Assistant Professor of Quantitative Psychology; 2014 – 2021

Education

Arizona State University, School of Social & Family Dynamics

- Post-doctoral fellow, Measurement & Statistical Analysis Program; 2012 – 2014
  Primary Mentor: Samuel B. Green

University of Notre Dame, Department of Psychology

- Ph.D. in *Quantitative Psychology*, 2012
  Dissertation advisors: Ken Kelley and Scott E. Maxwell

- M.A. in *Quantitative Psychology*, 2011
  Thesis advisors: Ken Kelley and Scott E. Maxwell

Guangdong University of Foreign Studies, China

- LL.B. in Legal Studies, 2006
- B.A. in English, 2005

Research Interests

- General latent variable models (e.g., structural equation modeling)
- Missing data analysis
- Robust methods
- Model evaluation & selection
- Bayesian statistics
- Multilevel/Longitudinal data analysis
- Quasi-experiments & Practical issues in modern research design

Publications

* denotes a student collaborator

- **Manuscripts under review or in preparation**

Lai, K., & Reuschel*, H. (in preparation). *Designing and analyzing partial measurement invariance models for latent mean comparisons*. Manuscript in preparation.

Reuschel*, H., & **Lai, K.** (in preparation). *On the input information for SEM sample size planning*. Manuscript in preparation.

Lai, K., & Simoes*, A. (in preparation). *Visual case diagnostics for structural equation model evaluation and selection*. Manuscript in preparation.

Simoes*, A., & **Lai, K.** (in preparation). *Sample size planning for standardized SEM parameters given incorrect model and nonnormal data*. Manuscript in preparation.

Lai, K. (under review). A better confidence interval for SRMR. *Psychometrika.* Manuscript under review.

- **Manuscripts in press or published**

Lai, K., & Simoes*, A. (in press). Reflecting on the "robust" standard errors for SEM parameters given categorical data: Mistakes and correction. *Structural Equation Modeling*.

Lai, K. (2021). Using information criteria under missing data: Full information maximum likelihood versus two-stage estimation. *Structural Equation Modeling, 28,* 278-291. https://doi.org/10.1080/10705511.2020.1780925

Lai, K. (2021). Fit difference between nonnested models given categorical data: Measures and estimation. *Structural Equation Modeling, 28*, 99-120. https://doi.org/10.1080/10705511.2020.1763802

Lai, K. (2021). Correct estimation methods for RMSEA under missing data. *Structural Equation Modeling, 28*, 207-218. https://doi.org/10.1080/10705511.2020.1755864

Depaoli, S., **Lai, K.**, & Yang*, Y. (2020). Bayesian model averaging as an alternative to model selection for multilevel models. *Multivariate Behavioral Research.* Advance online publication. https://doi.org/10.1080/00273171.2020.1778439

Lai, K. (2020). Confidence interval for RMSEA or CFI difference between nonnested models. *Structural Equation Modeling, 27,* 16-32. https://doi.org/10.1080/10705511.2019.1631704

Lai, K. (2020). Better confidence intervals for RMSEA in growth models given nonnormal data. *Structural Equation Modeling, 27,* 255-274. https://doi.org/10.1080/10705511.2019.1643246

Lai, K. (2020). Correct point estimator and confidence interval for RMSEA given categorical data. *Structural Equation Modeling, 27*, 678-695. https://doi.org/10.1080/10705511.2019.1687302

Depaoli, S., Winter*, S. D., **Lai, K.**, & Guerra-Pena, K. (2019). Implementing continuous non-normal skewed distributions in latent growth mixture modeling: An assessment of specification errors and class enumeration. *Multivariate Behavioral Research, 54,* 795-821. https://doi.org/10.1080/00273171.2019.1593813

Lai, K. (2019). A simple analytic confidence interval for CFI given nonnormal data. *Structural Equation Modeling, 26*, 757-777. https://doi.org/10.1080/10705511.2018.1562351

Lai, K. (2019). Creating misspecified models in moment structure analysis. *Psychometrika, 84*, 781-801. https://doi.org/10.1007/s11336-018-09655-0

Lai, K. (2019). More robust standard error and confidence interval for SEM parameters given incorrect model and nonnormal data. *Structural Equation Modeling, 26*, 260-279. https://doi.org/10.1080/10705511.2018.1505522

Lai, K. (2018). Estimating standardized SEM parameters given nonnormal data and incorrect model: Methods and comparison. *Structural Equation Modeling, 25,* 600-620. https://doi.org/10.1080/10705511.2017.1392248

Kelley, K., & **Lai, K.** (2018). Sample size planning for confirmatory factor models: Power and accuracy for effects of interest. In P. Irwing, T. Booth, & D. Hughes (Eds.), *The Wiley handbook of psychometric testing: A multidisciplinary reference on survey, scale, and test development* (pp. 113-138). Hoboken, NJ: Wiley.

Lai, K., & Zhang*, X. (2017). Standardized parameters in misspecified structural equation models: Empirical performance in point estimates, standard errors, and confidence intervals. *Structural Equation Modeling, 24*, 571-584. https://doi.org/10.1080/10705511.2016.1263155

Lai, K., Green, S. B., & Levy, R. (2017). Graphical displays for understanding SEM model similarity. *Structural Equation Modeling, 24,* 803-818. https://doi.org/10.1080/10705511.2017.1334206

Lai, K., Green, S. B., Levy, R., Xu*, Y., Yel*, N., Thompson, M. S., Eggum-Wilkens, N. D., Kunze*, K., Iida, M., Reichenberg*, R., & Zhang*, L. (2016). Assessing model similarity in structural equation modeling. *Structural Equation Modeling*, *23*, 491-506. https://doi.org/10.1080/10705511.2016.1154464

Lai, K., & Green, S. B. (2016). The problem with having two watches: Assessment of fit when RMSEA and CFI disagree. *Multivariate Behavioral Research, 51*, 220-239. https://doi.org/10.1080/00273171.2015.1134306

Zhang, Z., **Lai, K.**, Lu, Z., & Tong X. (2013). Bayesian inference and application of robust growth curve models using Student's *t*-distribution. *Structural Equation Modeling*, *20*, 47-78. https://doi.org/10.1080/10705511.2013.742382

Lai, K., & Kelley, K. (2012). Accuracy in parameter estimation for ANCOVA and ANOVA contrasts: Sample size planning via narrow confidence intervals. *British Journal of Mathematical and Statistical Psychology, 65,* 350-370. https://doi.org/10.1111/j.2044-8317.2011.02029.x

Lai, K., & Kelley, K. (2011). Accuracy in parameter estimation for targeted effects in structural equation modeling: Sample size planning for narrow confidence intervals. *Psychological Methods*, *16*, 127-148. https://doi.org/10.1037/a0021764

Kelley, K., & **Lai, K.** (2011). Accuracy in parameter estimation for the root mean square of approximation: Sample size planning for narrow confidence intervals. *Multivariate Behavioral Research*, *46*, 1-32. https://doi.org/10.1080/00273171.2011.543027

Lai, K. (2011). Sample size planning for latent curve models [Abstract]. *Multivariate Behavioral Research, 46*, 1013. https://doi.org/10.1080/00273171.2011.636705

Kelley, K., **Lai, K.**, & Wu, P.-J. (2008). Using R for data analysis: A best practice for research. In J. Osbourne (Ed.), *Best practices in quantitative methods* (pp. 535-572). Newbury Park, CA: Sage.

- **Peer-Reviewed Statistical Software**

Kelley, K., & **Lai, K.** (2010-2016). MBESS version 3. [Computer software and manual]. Accessible from https://cran.r-project.org/package=MBESS

Note: This is a package for the R statistics language to implement selected advanced and nonstandard quantitative methods that are not easily available otherwise. It has been peer-reviewed twice by *Journal of Statistical Software* and *Behavior Research Methods*. Part of the reviewing process of Lai and Kelley (2011a, 2011b) and Kelley and Lai (2011) also involved the review of this R package.

Invited Talk

Lai, K. (2021, October). *On the Implications of Missing Data for Using Information Criteria in SEM*. Department of Psychology, University of California Los Angeles, Los Angeles, CA.

Research Grants

Lai, K. (in preparation). *A flexible framework for complicated estimation problems in structural equation modeling*. National Science Foundation (Methodology, Measurement, and Statistics Program). Total proposed direct costs: $310,000 (to be finalized). Role: Principal Investigator.

Walle, E. A. (Declined, 2016). *Infant psychological functioning across the transition from crawling to walking.* National Institute of Child Health and Development. Total proposed direct costs: $1,286,097. Impact Score = 40 (top 31%). Role: Statistical Consultant.

Goldman-Mellor, S., & Lai, K. (Declined, 2016). *Community-level social adversity and nonfatal suicidal behavior: A population-based epidemiologic study.* American Foundation for Suicide Prevention. Role: Co-principal Investigator.

Teaching

University of California, Merced

PSY 010: Analysis of Psychological Data (undergraduate level statistics)
Spring 2015, Fall 2015, Spring 2016, Fall 2016, Fall 2017, Spring 2018, Fall 2018, Fall 2019, Fall 2020, Fall 2022

PSY 203: Multilevel Models (PhD level)
Spring 2015, Spring 2016, Spring 2017, Spring 2018, Fall 2019

PSY 215: Essential Mathematics for Quantitative Social Research (PhD level)
Spring 2019, Spring 2021

Arizona State University

CDE 691: Sample Size Planning and Power Analysis (PhD level)
Fall 2013

Formal Trainings in Teaching

- *Certificate in General Pedagogy: Developing Teaching Strategies.* Awarded by the Center for Research on Teaching Excellence, University of California at Merced; May 2015.
- *Effective and Exciting Teaching in Social Sciences and Humanities.* Completed a formal 2-credit teacher training course from the Kaneb Center for Teaching and Learning, University of Notre Dame, Summer 2011.

Advising

University of California, Merced

- Doctoral Dissertation

John Felt (2018, July). *Stress and Information Processing: The Effects of Stress Reactivity on Mental Abstraction.* Role = Dissertation committee member.

Yuzhu Yang (2018, July). *Bayesian Non-Parametric Methods for Latent Growth Mixture Models.* Role = Dissertation committee member.

Daniel Mello (2019, April). *Socioeconomic Risk and Family Relational Processes Among Late Adolescents with Type 1 Diabetes.* Role = Dissertation committee member.

Carmen Kho (2020, April). *Socio-Emotional Development in the Context of Close Relationships: The Role of Culture*. Role = Dissertation committee member.

Nicole Zelinsky (2020, May). *Studies of Monte Carlo Methodology for Assessing Convergence, Incorporating Decision Making, and Manipulating Continuous Variables.* Role = Dissertation committee member.

Anabel Castillo (2021, May). *The Bilingual Advantage Debate: Are We Getting Warmer?* Role = Dissertation committee member.

Sonja Winter (2021, June). *Advanced Methods for Detecting Specification Issues in Bayesian Structural Equation Modeling.* Role = Dissertation committee member.

Ana Simoes (on going). *A New Robust Method for the Calculation of Standard Errors for Structural Equation Models with Categorical Data.* Role = Advisor.

- Doctoral Candidacy

John Felt (2016, June). *An overview of latent growth curve models for biological markers of stress.* Role = Candidacy paper committee member.

Yuzhu Yang (2017, July). *Bayesian model averaging as an alternative to model selection for multilevel models.* Role = Candidacy paper committee member.

Carmen Kho (2017, August). *Parental Control and Child Psychological Adjustment in a Cultural Context.* Role = Candidacy paper committee member.

Anabel Castillo (2018, May). Comprehensive candidacy qualifying exam. Role = Exam committee member.

Sonja Winter (2020, March). *Classification and Parameter Estimate Accuracy of Growth Mixture Models with and Without Class Predicting Covariates: Frequentist and Bayesian Approaches.* Role = Candidacy paper committee member.

Ana Simoes (2021, December). *Visualization Tools for Case and Model Diagnostics in Structural Equation Modeling.* Role = Advisor.

Reuschel, H. (2022, September). *On the Effects of Indicator Selection and Between-Group Constraints on Latent Mean Comparison.* Role = Advisor.

- Master's Thesis

Xiaoguang Zhang (2017, May). *The Robustness of the Delta Method and Bootstrap in Calculating Standardized Coefficient in Misspecified SEM Models*. Role = Advisor & Thesis committee chair.

Michelle Turitz (2020, June). *Frequentist and Bayesian Meta-Analyses with Dynamic Variance.* Role = Thesis committee member.

Reuschel, H. (2020, March). *On the Input Information for SEM Sample Size Planning.* Role = Advisor.

Ana Simoes (2020, February). *Sample Size Planning for Standardized SEM Parameters Given Incorrect Model and Nonnormal Data.* Role = Advisor.

- Faculty Advisory Committee

Quantitative Psychology: Yuzhu Yang; James Clifton; John Felt; Michelle Turitz; Marcus Vadnais; Xiaoguang Zhang; Patrice Cobb; Nicole Zelinsky; Hope Reuschel; Ana Simoes; Sonja Winter; Lydia Marvin

Developmental Psychology: Carmen Kho; Anabel Castillo

Health Psychology: Amber Arroyo; John Felt

Arizona State University

- Master's Thesis

Yuning Xu (2014, May). *The Impact of Varying the Number of Measurement Invariance Constraints on the Assessment of Between-Group Differences of Latent Means*. Role = Thesis committee member.

Review

- **Ad Hoc Journal Reviewer**

British Journal of Mathematical and Statistical Psychology
Behavior Research Methods
Educational and Psychological Measurement
Journal of Educational and Behavioral Statistics
Journal of Experimental Education
Multivariate Behavioral Research
Psychological Methods
Research Synthesis Methods
Structural Equation Modeling

- **Ad Hoc Grant Reviewer**

National Science Foundation

- **Conference Review Panel**

Student Presentation Section, the annual meeting of the Society of Multivariate
Experimental Psychology, 2012

References

Scott E. Maxwell
Professor Emeritus and Matthew A. Fitzsimon Chair
Department of Psychology
University of Notre Dame
Scott.E.Maxwell.1@nd.edu

Ken Kelley
Edward F. Sorin Society Professor of IT, Analytics, and Operations
Senior Associate Dean for Faculty and Research
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Roy Levy
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T. Denny Sanford School of Social and Family Dynamics
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