ZONGGUI LI, Ph.D.

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EDUCATION

Ph.D. in Quantitative Psychology August 2019 - May 2025
Department of Psychology and Neuroscience, Boston College, Chestnut Hill, MA
Advisor: Dr. Ehri Ryu
Dissertation Title: Quantifying change in latent transition analysis: effect size and its confidence interval

M.Ed. in Quantitative and Qualitative Methodology, Measurement, and Evaluation August 2016 - May 2018
College of Education, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL
Advisor: Dr. Jinming Zhang

B.S. in Applied Psychology September 2012 - June 2016
School of Education and Psychology, University of Jinan, China

SUMMARY

Quantitative researcher with a strong foundation in advanced statistical analysis (e.g., MLM, SEM, LTA), psychometrics (e.g., IRT, CTT), longitudinal modeling, machine learning, and simulation study in social science. Experienced in analyzing large-scale survey and assessment data to generate organizational and practical solutions. Proficient in *R*, *SAS*, *Mplus*, and *Python*, with hands-on experience communicating complex statistical findings as data-driven, actionable recommendations tailored to diverse stakeholders. Passionate about applying research to inform decision-making, improve policy, and promote equitable outcomes, particularly for underserved populations.

RELEVANT COURSES

Multilevel Modeling, Structural Equation Modeling, Measurement I: Classical Test Theory, Psychometric Theory II: Item Response Theory, Introduction to Machine Learning, Analysis with Missing Data, Response Models for Categorical Data, Biostatistics with R

PROFESSIONAL & INTERNSHIP EXPERIENCE

Center of Research Services at Boston College Chestnut Hill, MA
Statistical Consultant (Supervisor: Dr. Melissa McTernan) August 2023 - May 2025

- Delivered 26 statistical consulting projects on research design, data analysis, code debugging, and model interpretation utilizing R, SAS, and Mplus for faculty, postdocs, and graduate students across disciplines
- Co-organized 2 advanced statistical workshops; facilitated real-time learning by fielding technical/statistical questions and relaying audience insights to the instructor
- Skilled at clearly communicating complex concepts to non-technical audiences through both written and verbal explanations using visual aids and examples
- Supported manuscripts and dissertation development, refining methodological sections

Curriculum Associates North Billerica, MA
Research and Efficacy Intern (Manager: Dr. Kelsey Young) June 2024 - December 2024

- Initiated project that analyzed over 1,000,000 K-8 longitudinal assessment records from pre- and post-COVID periods to identify key trends and inform curriculum improvement
- Developed 5 methods to explore data, using a range of statistical techniques (e.g., sequence analysis, multinomial logistic regression); delivered multi-perspective data-driven evidence to strengthen sales strategy and drive product promotion
- Authored internal analysis publication, drafted QC documentation, and created template R scripts for future projects
- Processed large datasets from AWS S3, and created automated R scripts for data management and modeling, increasing efficiency by over 70%

The National Commission on Certification of Physician Assistants (NCCPA) Johns Creek, GA
Research and Psychometric Intern (Supervisor: Dr. Christiana Akande) June 2023 - August 2023

- Pioneered the use of latent transition analysis to examine dynamic behavioral change of physician assistants, facilitating the certification standard setting for different subpopulation

- Analyzed longitudinal survey data over 18,000 respondents by integrating Mplus into R for automated modeling; reduced processing time by 75% and improved output visualization and reproducibility
- Authored a paper and was invited to present at the American Board of Medical Specialties (ABMS) 2024 conference to an audience of over 600 healthcare and assessment professionals

The Nutrition and Cancer Survivorship Lab at University of Illinois at Urbana-Champaign Urbana, IL
Biostatistician (PI: Dr. Anna Arthur) November 2018 - May 2019

- Collaborated with 4 colleagues on research design and data analysis, published 4 scientific papers in leading journals
- Managed longitudinal data from REDCap, using SAS macro and R for analysis (e.g., survival analysis, logistic regression); delivered customized statistical consulting to researchers, aligning methods with project-specific needs

Cognitive & Affective Neuroscience of Psychopathology Lab Champaign, IL
Research Assistant (PI: Dr. Wendy Heller) July 2018 - May 2019

- Supported participant recruitment
- Managed data files from cognitive test and interview; scored psychological measures using Qualtrics and Excel
- Conducted preliminary statistical analyses using SPSS to support ongoing research projects

Center for Innovation in Teaching and Learning Champaign, IL
Data Analyst (Supervisor: Dr. Rajat Chadha) March 2018 - May 2018

- Prepared data files (questionnaires, student performance data, consent forms) for analysis using SPSS syntax and Excel
- Developed test questions and response mapping frameworks for analysis
- Performed data analysis in SPSS to evaluate instructional outcomes

National Innovation Center for Assessment of Basic Education Quality Beijing, China
Research Intern (Supervisor: Dr. Tao Xin) June 2017 - July 2017

- Promoted New Reading Test items localized for the PISA 2018 field test in China
- Contributed to the development of the coding book and manuscripts across Reading, Math, and Science domains
- Coordinated the preparation and organization of materials for the 2018 First National PISA Conference

RESEARCH EXPERIENCE

Quantifying change in latent transition analysis: effect size and its confidence interval (Dissertation)
Boston College June 2023 - March 2025

- Developed an effect size measure computation and designed a simulation study to examine its performance, promoting its application in longitudinal research
- Used SAS macros to implement bootstrap procedures for computing confidence intervals, improved computational efficiency
- Used automated R scripts on a Linux based HPC cluster to enable efficient large-scale simulation and analysis

Confidence interval of effect size measures for longitudinal growth model
Boston College April 2022 - June 2023

- Investigated the performance of four bootstrap confidence interval methods for effect size measures in longitudinal growth models
- Designed and executed a large-scale simulation study using R on a Linux-based HPC cluster to enhance computational efficiency
- Invited to present findings at the 2022 Annual Meeting of the Psychometric Society (IMPS)

A Prediction Problem in a Large Adaptive Learning Platform
Datathon of the 2022 Annual Meeting of the Psychometric Society (finalists, top 4) July 2022

- Led team planning and coordination, managed task assignments, and tracked progress across deliverables
- Invited to present final report to judges and over 500 conference attendees, advancing to the top 4 finalist teams
- Created features and tested different machine learning models for item difficulty prediction, discovered the SVM achieved the highest accuracy

Effect size measures for longitudinal growth model
Boston College January 2020 - September 2022

- Developed a flexible dummy indicator matrix approach to compute effect size measures for longitudinal growth models
- Developed user-friendly R functions to implement the method
- Applied the method in an empirical illustration using ECLS-K:2011 national longitudinal dataset

Understanding the self-regulatory and planning actions among older Dutch adults
University of Illinois at Urbana-Champaign January 2018 - March 2019

- Conducted exploratory and confirmatory factor analysis on data from 2,671 older adults to develop a self-regulation scale
- Used structural equation modeling (SEM) in R to explore links between self-regulation and behavioral health outcomes

Assessing new methods for calculating reliability for self-regulation scale (ITW-M)
University of Illinois at Urbana-Champaign November 2017- February 2018

- Analyzed data from 1,155 U.S. respondents using R to calculate Cronbach's alpha and model-based omegas across four sample sizes
- Identified the bi-factor model as the most reliable structure for internal consistency, supporting scale development and validation

Evaluating the Impact of Peer Support on Cancer Patient Well-Being
University of Jinan June 2014 - October 2015

- Collected survey and interview data from over 100 patients and 47 caregivers to assess psychosocial outcomes in support group settings
- Analyzed mixed-methods data and published findings demonstrating improved quality of life and reduced anxiety and depression among participants

TEACHING EXPERIENCE

Department of Psychology and Neuroscience, Boston College Chestnut Hill, MA
Graduate Teaching Assistant (Introduction to Behavioral Statistics and Research) August 2019 - May 2024

- Independently instructed online and in-person classes for over 40 students for 3 years, significantly reducing student support requests compared to previous semesters as noted by the instructor
- Developed weekly 1-on-1 mentoring sessions for 5 students, all students achieved high academic performance (grade A)
- Mentored 1 student through the graduate application process, resulting in acceptance to a top Ph.D. program

School of Education and Psychology, University of Jinan Shandong, China
Undergraduate Teaching Assistant (Cognitive Psychology) September 2014 - January 2015

- Coordinated weekly lab materials and managed experiment schedules for 38 students
- Facilitated in-class group activities and effective communication between students and the instructor

PUBLICATIONS

Li, Z. & Ryu, E. Effect Size Measures for Longitudinal Growth Model. (Manuscript in preparation)

Li, Z., Kelsey, Y., Ethan, Y., & Steven, C. Tracking Student Placement Transitions Before and After COVID-19. (Manuscript in preparation)

Crowder, SL., Welniak, TL., Hoogland, AI., Small, S., Rodriguez, Y., Carpenter, KM., Fischer, S., Li, D., Kinney, AY., Rotroff, D., Mariam, A., Brownstein, N., Reich, R., Hembree, T., Playdon, MC., Arthur, AE., Maino Vieytes, CA., **Li, Z**, Extermann, M., Kim, R., Berry, D., Jim, H. (2022). Diet Quality Indices and Changes in Cognition during Chemotherapy. *Supportive Care in Cancer*.

Crowder, SL., **Li, Z.**, Sarma, KP., Arthur, AE. Chronic Nutrition Impact Symptoms Are Associated with Decreased Functional Status, Quality of Life, and Diet Quality in a Pilot Study of Long-Term Post-Radiation Head and Neck Cancer Survivors. *Nutrients*. 2021; 13(8):2886.

Maino Vieytes, C. A., Mondul, A. M., **Li, Z.**, Zarins, K. R., Wolf, G. T., Rozek, L. S., & Arthur, A. E. (2019). Dietary Fiber, Whole Grains, and Head and Neck Cancer Prognosis: Findings from a Prospective Cohort Study. *Nutrients*, 11(10), 2304.

Crowder, S. L., Sarma, K. P., Mondul, A. M., Chen, Y. T., **Li, Z.**, Pepino, M. Y., & Arthur, A. E. (2019). Pretreatment Dietary Patterns Are Associated with the Presence of Nutrition Impact Symptoms 1 Year after Diagnosis in Patients with Head and Neck Cancer. *Cancer Epidemiology and Prevention Biomarkers*, 28(10), 1652-1659.

CONFERENCE PRESENTATIONS

Li, Z., Akande, C., Walker, M., Dallas, D., & Kozikowski, A. (2024, September) *Behavioral Transitions in Longitudinal Medical Recertification Examination: A Latent Transition Analysis.* Poster presentation at American Board of Medical Specialties Conference 2024, Chicago, IL.

Yun, H., Li, W., **Li, Z**. & Hartshorne, J. (2023, July) *Will children learn English faster if their native language is similar to English?* Poster presentation at the Annual Conference of Cognitive Science Society, Sydney, Australia.

Li, Z. & Ryu, E. (2023, June). *Confidence Interval of Effect Size in Longitudinal Growth Models.* Poster presentation at the Modern Modeling Methods Conference (M^3), Storrs, CT.

Li, Z. & Ryu, E. (2022, July). *Confidence Interval of Effect Size Measures in Longitudinal Growth Models*. Oral presentation at the Annual Meeting of the Psychometric Society, Bologna, Italy.

Li, Z., Yuan, Y. & Wu, L. (2022, July). *A Prediction Problem in a Large Adaptive Learning Platform*. Datathon finalists (top 4) oral presentation at the Annual Meeting of the Psychometric Society, Bologna, Italy.

Li, Z. & Ryu, E. (2022, March). *Effect Size Measures in Longitudinal Growth Models*. The 8th Texas Universities' Educational Statistics and Psychometrics (TUESAP). (virtual conference)

Li, Z. & Ryu, E. (2021, August). *Effect Size for Longitudinal Growth Model in MLM and SEM*. Poster presented at the Annual Convention of the American Psychological Association. (virtual conference)

Li, Z. & Ryu, E. (2021, April). *Effect Size Measures for Longitudinal Growth Model*. Round table presentation at the Annual Meeting of American Educational Research Association. (virtual conference)

SKILLS

Software: R, SAS, Mplus, Python, Winstep, IRTPRO, SPSS, Stata, Microsoft Office, Qualtrics, Linux Clusters, Jira, REDCap

Statistical method: MLM, SEM, IRT, CTT, LTA, EFA, CFA, Neural Networks, Deep learning, Simulation, Survey Research

Leadership: Quantitative Psychology Representative, Area Representative at Boston College (2019-2025); Committee Member, Graduate Visiting Day at Boston College (2019-2025)

Languages: English, Mandarin, Cantonese (intermediate)

CERTIFICATIONS

International Career Certification

Teacher Certificate of China

National Psychological Consultant Certification: Level 3