YALE QUAN

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EDUCATION

Exp. Jun 2026   **PhD Measurement & Statistics**
University of Washington. Seattle WA.
Advisor: Chun Wang, PhD

Dec 2020   **MS Applied Statistics**
California State University, Long Beach. Long Beach CA
Committee: Sung Eun Kim PhD (Chair), Kagba Suaray PhD, Jen-Mei Chang PhD,

Thesis Title: A Multivariate Statistical Analysis of Major Change Patterns and Significant Factors That Influence Graduation Rates: A Case Study at California State University, Long Beach

May 2013   **BS Criminal Justice**
California State University, Long Beach. Long Beach CA

INTERESTS

My research passion lies at the intersection between applied statistics and education and is focused on issues of education inequality that exist in higher education. My two main methodological research interest are the development and interpretation of multidimensional nonlinear latent variable models to measure key educational constructs and the refinement and development of statistical models used to perform nonlinear multidimensional clustering with mixed data types. My educational research interest focuses on the use of psychometric and statistical models to identify educational opportunity gaps. I am highly skilled in the use of R and Python for statistical analyses. I am also experienced using the *EdSurvey* package in R for analyzing complex large scale assessment data including Trend Analysis, Latent Regression, and Direct Estimation of plausible values.

In addition to my methodological interests, I am passionate about educational and behavioral science research that promotes equity and social good. When I'm not working, I enjoy spending time with my family and friends exploring the outdoors.

AWARDS/HONORS

2023   **NAEP Winter Data Training**
American Institutes for Research. Arlington VA.

2022   **Community Partner Doctoral Fellowship Award,**
College of Education, University of Washington. Seattle WA.

CERTIFICATION COURSES

2024   **Data Science Methods for Digital Learning Platforms**
University of Pennsylvania. Philadelphia PA.

RESEARCH

Sept. 2022 – Present *Community Partner* *Doctoral Fellow*	**Equal Opportunity Schools. Seattle WA** Examine the psychometric validity and reliability of the student belonging survey and provide recommendations on areas the survey can be improved. Develop and implement advanced statistical methods including *Longitudinal Item Response Theory Models*, *Multilevel Modeling*, and *Structural Equation Modeling* to uncover and understand patterns in student level data to support evidence-based decisions for education policy. Create Tableau dashboards and storyboards that provide insight on equitable distribution of school resources. *Supervisors: Alejandro Torres PhD, Jessica Paulson PhD*
Summer 2021 *Educational Research* *Consultant*	**Center for Social Science Computation and Research.** **University of Washington, Seattle, WA** Provided statistical and programming consulting services to students and faculty across University of Washington Seattle campus. *Supervisor: Jerald Herting, PhD.*

PRESENTATIONS AND PUBLICATONS

Quan, Y. B., & Wang, C. (2023, November). *A multiple-group higher-order IRT approach to calibrate multidimensional assessments with structural missingness* [Presentation]. Second Annual Pacific Northwest Research on Psychometrics and Applied Statistics Conference, Seattle, WA.

Quan, Y. B., & Wang, C. (2022) *Effects of Sample Size and Collapse Direction on Parameter Recovery* [Presentation] National Council on Measurement in Education: Chicago, IL, United Sates

Quan, Y.B. (2021, November). *Clustering Education Data Using K-Medoids with Partitioning Around the Medoids Algorithm* [Seminar Presentation]. Measurement & Statistics Seminar, University of Washington. Seattle, WA, United States.

Quan, Y. B. (2020, November). *A Multivariate Statistical Analysis of Major Change Patterns and Significant Factors That Influence Graduation Rates: A Case Study at California State University, Long Beach* [Paper presentation]. Beyond the First Year. Long Beach, CA, United States.

Quan, Y. B. (2020). *A Multivariate Statistical Analysis of Major Change Patterns and Significant Factors That Influence Graduation Rates: A Case Study at California State University, Long Beach* (Publication No. 28155286) [Master's thesis, California State University Long Beach]. ProQuest Dissertations and Theses Global.

CLASS PROJECTS

EDPSY 588 Structural Equation Modeling II – Measurement Invariance of the Second Order Factor Model
Presented research on performing Generalizability and Decisions studies with Continuous Latent Random Variables. An initial simulation study was performed using GENOVA and replicated using CFA using observed data and then as a realization of a Continuous Latent Random Variable using the *lavaan* package in R. The simulation study confirmed that GENOVA and CFA provide identical results when using observed data. However, treating the data as a realization of a Continuous Latent Random Variable results in significantly different results.

EDPSY 558 Generalizability Theory – Using Generalizability Theory with Continuous Latent Random Variables
Presented research on performing Generalizability and Decisions studies with Continuous Latent Random Variables. An initial simulation study was performed using GENOVA and replicated using CFA using observed data and then as a realization of a Continuous Latent Random Variable using the *lavaan* package in R. The simulation study confirmed that GENOVA and CFA provide identical results when using observed data. However, treating the data as a realization of a Continuous Latent Random Variable results in significantly different results.

EDPSY 592 Item Response Theory II – An Introduction to Longitudinal Item Response Theory Analysis Using a Two-Tier Item Response Theory Model
Researched and developed a simulation study on performing a longitudinal item response theory analysis utilizing a two-tier longitudinal item response theory model. This research was used to develop a presentation, with accompanying R code, that can be used to introduce beginning researchers to longitudinal item response theory analysis.

EDPSY 539 Classical Test Theory - A Reliability and Validity Study of EPDSY 490 Spring 2022
Performed a reliability and validity study of assessments administered to Spring 2022 EPDSY 490 students. The goal of this project was to determine if (1) The assessment was a reliable measure of the course content, (2) Determine what, if any, biases may be present in the assessment, and (3) Study the construct validity of the assessment and its underlying factor structure. Methodology primarily consisted of Exploratory Factor Analysis, Chronbach's Alpha, and applications of Classical Test Theory methodology. Analysis was performed using R and SPSS.

CS&SS 544 Event History Analysis - Teacher Retention in Washington, An Event History Analysis
An analysis of teacher retention from 2017-2020 in Washington using data publicly available from the Washington State Office of Superintendent of Public Instruction (OSPI). Specifically, the OSPI S-275 datasets for each year were merged with other publicly available OSPI datasets to create a comprehensive public dataset of Washington teachers. Methodology primarily consisted of non-parametric modeling techniques including Life Tables and using time-varying covariates and coefficients in a Cox regression model.

EDPSY 591 Item Response Theory I - An Item Response Theory Analysis of Biology Freshman Survey
A psychometric analysis of a survey administered to incoming freshman at California State University, Long Beach who were admitted into the Biological Sciences major. The goal of the analysis was to determine if there is any significant difference between the latent trait estimates of students who were admitted as Biological Sciences Majors to CSULB in 2020 as compared to students admitted in 2021, determine if there is a significant difference in latent trait estimates between male and female students, and determine if there are any significant correlations between latent trait estimates.

EDPSY 576 Multilevel Modeling - Predicting Growth Mindset
　　This project attempts to contribute to the literature on fostering growth mindset in students by using the 2018 PISA and focusing on the association between student's perception of their school and teachers and growth mindset in the context of students in grades eight through twelve in the United States. Due to the hierarchical structure of the data (students within schools) survey data, a Multilevel Logistic Model was fit to the data.

TEACHING EXPERIENCE

Aug 2021 – June 2022   <u>**University of Washington**</u>   ***Seattle, WA***

Teaching Assistant

- EDPSY 490 – **Basic Educational Statistics**
  Course content includes measurement scales, sampling distributions, confidence intervals, 1- and 2-group z/t/chi-square tests, and simple linear regression.

- PSYCH 209 - **Fundamentals of Psychological Research**
  Topics include the logic of hypothesis testing, experimental design, research strategies and techniques, fundamentals of scientific writing, searching and evaluation of research literature in psychology, and ethical issues in psychological research.

Dec 2020 – Mar 2021   <u>**California State University, Long Beach**</u>   ***Long Beach, CA***

Lecturer

- STAT 108* - **Statistics for Everyday Life**
  Topics include exploratory data analysis, methods of visualizing data, descriptive statistics, misuse, and manipulation of data in statistical analysis, probability, binomial and normal distributions, confidence intervals, hypothesis testing, correlation and regression, contingency tables.

Aug 2018 – Dec 2020   <u>**California State University, Long Beach**</u>   ***Long Beach, CA***

Teaching Associate

- STAT 108 - **Statistics for Everyday Life**
  Topics include exploratory data analysis, methods of visualizing data, descriptive statistics, misuse, and manipulation of data in statistical analysis, probability, binomial and normal distributions, confidence intervals, hypothesis testing, correlation and regression, contingency tables.

- MATH 112B - **Essential Algebra B**
  Topic included recognizing, relating, describing, manipulating, and applying functions and equations that are polynomial, rational, exponential, and logarithmic.

- MATH 104/94* - **The Power of Mathematics**
  Topics that demonstrate the power and art of mathematical thinking. Development of quantitative and financial literacy; number sense and computational skills; mathematical habits of mind; communication skills across various mathematical forms; and ability to analyze realistic problems with mathematical tools.

Aug 2017 – Aug 2018 **California State University, Long Beach**   *Long Beach, CA*

Supplemental Instructor

- MATH 115/SI 60* - **Business Calculus**
  Content includes functions, derivatives, optimization problems, graphs, partial derivatives. Applications to business and economics. Emphasis on problem-solving techniques.

- MATH 122/SI 60* - **Calculus I**
  Content includes Continuous functions. Derivatives and applications including graphing, related rates, and optimization. Transcendental functions. L'Hospital's Rule. Antiderivatives. Definite integrals. Area under a curve**.**

* Instructor of Record

PROFESSIONAL SERVICE

2023 **Reviewer - 2024 AERA Annual Meeting Division D Measurement and Research Methodology**
- Educational Measurement, Psychometrics
- Quantitative Methods and Statistical Theory

2022 **2023 National Council on Measurement in Education (NCME) Training Proposal Reviewer**

MEMBERSHIPS

2022 – Present **National Council on Measurement in Education (NCME)**

2022 – Present **American Educational Research Association (AERA), Division D**

2019 – Present **Phi Kappa Phi Honor Society**

TRAININGS ATTENDED

2023 **Winter 2023 NAEP Data Training Workshop**

2020 **National Center for Education Statistics (NCES)**
- Process Data Summer Training Series