Matthew J. Madison

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Education

Degree	*Program*	*Institution*	*Year*
Ph.D.	Quantitative Methodology	University of Georgia	2016
M.S.	Statistics	University of Georgia	2014
M.A.	Mathematics	Central Michigan University	2011
B.S.	Mathematics	University of South Carolina	2009

Academic Positions

Clemson University July 2018 – Present
College of Education
Department of Education and Human Development
Assistant Professor, Quantitative Methodology

University of California – Los Angeles June 2016 – June 2018
Graduate School of Education and Information Studies
Social Research Methodology Division
Assistant Professor, Advanced Quantitative Methods

Research Interests

Psychometrics; diagnostic classification models; item response models; longitudinal psychometric models; K-16 formative assessment; mathematics and statistics education

Publications

*Indicates collaboration with a graduate student.

Madison, M. J., & Bradshaw, L. (in press). Assessing growth in a diagnostic classification model framework. *Psychometrika*.

Madison, M. J., & Bradshaw, L. (2018). Evaluating intervention effects in a diagnostic classification model framework. *Journal of Educational Measurement, 55*(1), 32-51.

Bradshaw, L., & **Madison, M. J.** (2016). Invariance properties for general diagnostic classification models. *International Journal of Testing, 16*(2), 99-118.

Madison, M. J., & Bradshaw, L. (2015). The effects of Q-matrix design on classification accuracy in the LCDM. *Educational and Psychological Measurement, 75*(3), 491-511.

Piatek-Jimenez, K., **Madison, M. J.**, & Przybyla-Kuchek, J. (2014). Equity in mathematics textbooks: A new look at an old issue. *Journal of Women and Minorities in Science and Engineering, 20*(1), 55-74.

Piatek-Jimenez, K., & **Madison, M. J.** (2012). Equity in mathematics textbooks: A report on progress. *Proceedings of the 34th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education.* Kalamazoo, MI: Western Michigan University.

Manuscripts Under Review

*Indicates collaboration with a graduate student.

Madison, M. J. Reliably assessing growth with longitudinal diagnostic classification models. Manuscript under review.

***Madison, M. J.,** Chung, S., Kim, J., & Bradshaw, L. P. Approaches to estimating longitudinal diagnostic classification models. Manuscript under review.

Current Grant Support

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Grant Proposals Under Review

Principal Investigator: CAREER: *Multilevel Diagnostic Classification Models for Evaluating Intervention Effects* (2019 – 2024). National Science Foundation ~ $559,363.

Previously Funded Grants

Principal Investigator: *Assessing Nested Effects in a Diagnostic Classification Model Framework* (2017 – 2018). UCLA Faculty Research Grant ~ $6,305.

Unfunded Grant Proposals

Co-Principal Investigator: *Know Your Nearest Neighbors* (2018 – 2023). National Science Foundation: Discovery Research PreK – 12 ~ $2,999,569. PI: David Weintrop.

Co-Principal Investigator: *Talent for Teaching* (2018 – 2023). National Science Foundation: Robert Noyce Scholarship Program ~ $1,447,285. PI: Christopher Anderson.

Co-Principal Investigator: *Principles of Data Science (PODS)* (2017 – 2020). National Science Foundation: STEM + Computing ~ $2,500,000. PI: Rob Gould.

Principal Investigator: *Diagnosing Teachers' Statistical Preparation* (2017 – 2018). UCLA Transdisciplinary Seed Grant ~ $32,337.

Research Presentations

*Indicates collaboration with a graduate student.

2018

Madison, M. J., & Bao, Y. (2018, July). *A longitudinal and polytomous diagnostic classification model.* Paper presented at the International Meeting of the Psychometric Society in New York, NY.

*Keenan, E. G., **Madison, M. J.**, Wood, J. J., & Lerner, M. D. (2018, May). *Psychometric analysis of the autism spectrum quotient using diagnostic classification modeling*. Poster presented at the Annual Meeting of the International Society for Autism Research, Rotterdam, Netherlands.

Madison, M. J. (2018, April). *Item influence measures for diagnostic classification models.* Paper presented at the annual meeting of the National Council on Measurement in Education in New York, NY.

*Cho, A. C. B., Wood, J., & **Madison, M. J.** (2018, January). *Personality matters: A latent profile analysis of personality subgroups in children with autism spectrum disorder*. Poster presented at the Annual Conference for the University of California Center for Research on Special Education, Disabilities, and Developmental Risk in Davis, CA.

2017

Madison, M. J., (2017, October). *A diagnostic approach to reliably assessing growth.* Paper presented at the annual meeting of the Northeastern Education Research Association in Trumbull, CT.

*Cruz, E., & **Madison, M. J.** (2017, October). *Diagnosing teachers' statistical preparation: A Pilot Study*. Paper presented at the Annual Meeting of the Society for Advancement of Chicanos/Hispanics and Native Americans in Science in Salt Lake City, UT.

Madison, M. J., & Bradshaw, L. (2017, April). *Evaluating intervention effects in a diagnostic classification model framework.* Paper presented at the annual meeting of the National Council on Measurement in Education in San Antonio, TX.

2016

*Grantham, T., **Madison, M. J.**, Collins, K., & Luckey, J. (2016, November). *Single-subject acceleration for gifted Black males using the Math Hall and Ball afterschool program*. Paper presented at the annual meeting of the National Association for Gifted Children in Orlando, FL.

Madison, M. J., & Bradshaw, L. (2016, October). *Evaluating innovative instruction using a longitudinal diagnostic classification model.* Paper presented at the annual meeting of the Northeastern Education Research Association in Trumbull, CT.

Madison, M. J., & Bradshaw, L. (2016, July). *Assessing growth in a general diagnostic classification model.* Paper presented at the International Meeting of the Psychometric Society in Asheville, NC.

Xiong, X., **Madison, M. J.**, & Mattar, J. (2016, April). *Speededness for task based simulations items in a multi-stage licensure examination*. Paper presented at the annual meeting of the National Council on Measurement in Education in Washington, D.C.

Madison, M. J., & Bradshaw, L. (2016, April). *Assessing growth in a diagnostic classification model framework.* Poster presented at the 2016 College of Education Graduate Student and Faculty Research Conference in Athens, GA.

2015

Madison, M. J., & Bradshaw, L. (2015, October). *Invariance properties for general diagnostic classification models.* Paper presented at the annual meeting of the Northeastern Education Research Association in Trumbull, CT.

Madison, M. J., & Bradshaw, L. (2015, April). *Using Q*Power to refine diagnostic assessment designs.* Paper presented at the annual meeting of the American Educational Research Association in Chicago, IL.

Madison, M. J. & Bradshaw, L. (2015, February). *Developing Diagnostic Formative Assessments in Graduate Statistics Courses.* Poster presented at the 2015 College of Education Graduate Student and Faculty Research Conference in Athens, GA.

2014

Madison, M. J. & Bradshaw, L. (2014, April). *The effects of Q-matrix design on classification accuracy in the LCDM.* Poster presented at the 2014 College of Education Graduate Student and Faculty Research Conference in Athens, GA.

Madison, M. J., Bradshaw, L., & Hollingsworth, B. (2014, April). *The role of Q-matrix design in diagnostic assessment.* Paper presented at the annual meeting of the National Council on Measurement in Education in Philadelphia, PA.

2013

Madison, M. J. & Bradshaw, L. (2013, October). *The effects of Q-matrix design on classification accuracy in the LCDM.* Paper presented at the annual meeting of the Northeastern Education Research Association in Rocky Hill, CT.

Madison, M. J., & Templin, J. (2013, April). *Group-mean centering in hierarchical linear models: A weighting approach*. Poster presented at the 2013 College of Education Graduate Student Research Conference in Athens, GA. Awarded 2nd place research prize.

2012

Bradshaw, L., Brown, C., Cohen, A., **Madison, M. J.**, & Templin, J. (2012, December). *Evaluating the statistical properties of epistemic network analysis*. Poster presented at the 4th annual Discovery Research K-12 Meeting in Madison, WI.

Piatek-Jimenez, K., & **Madison, M. J.** (2012, November). *Equity in mathematics textbooks: A report on progress.* Poster presented at the annual conference of the North American Chapter of the International Group for the Psychology of Mathematics Education in Kalamazoo, MI.

Marcinek, T., & **Madison, M. J.** (2012, July). *Learning to interpret the mathematical thinking of others in pre-service mathematics courses: potential and limitations*. Paper presented at the 12th International Congress on Mathematical Education in Seoul, Korea.

Hamed, D., & **Madison, M. J.** (2012, April). *Factors affecting student achievement in business calculus*. Poster presented at the annual Student Research and Creative Endeavors Exhibition in Mount Pleasant, MI.

Invited Presentations

Madison, M. J. (2018, April). *A diagnostic classification analysis of an MDTP Test.* Invited presentation to the Working Group of the Mathematics Diagnostic Testing Project. Long Beach, CA.

Madison, M. J. (2018, March). *Meaningful metrics in educational research.* Invited presentation to the Quantitative Methodology Colloquium, UGA Department of Educational Psychology.

Madison, M. J. (2018, February). *Getting more out of educational assessments.* Invited presentation to the Precision Institute at National University in San Diego, CA.

Madison, M. J. (2018, January). *Non-arbitrary metrics in educational research.* Invited presentation to the Teaching and Learning Lab (TALL), UCLA Department of Psychology.

Madison, M. J. (2017, October). *Evaluating learning (and forgetting) over time via a diagnostic classification model.* Invited presentation to the Cognitive Psychology CogFog Meeting, UCLA Department of Psychology.

Madison, M. J. (2017, October). *Psychometric models for the reliable measurement of multiple latent traits*. Invited presentation to the UCLA Department of Statistics Research Seminar.

Madison, M. J. (2017, April). *Evaluating an instructional intervention with a longitudinal diagnostic model*. Invited presentation to the Human Development and Psychology Colloquium, UCLA Department of Education.

Madison, M. J. (2016, May). *Navigating the academic job market.* Invited presentation to Graduate Researchers in Educational Psychology at the University of Georgia.

Madison, M. J. (2016, January). *Getting more out of educational assessments.* Invited presentation at the 2016 University of Georgia College of Education Doctoral Recruitment Weekend in Athens, GA.

Technical Reports

Madison, M. J. (2018). *A Diagnostic Classification Analysis of an MDTP Test*. Technical Report. Mathematics Diagnostic Testing Project.

Madison, M. J. (2015). *Examining the Speediness of the Uniform CPA Examination*. Technical Report. American Institute of Certified Public Accountants.

Developed Software

Madison, M. J., Bradshaw, L. (2015). Q*Power (1.0): A tool for prospective diagnostic assessment design. [Computer software]. Athens, GA.

Teaching Experience

Graduate Courses

Instructor: EDF 9270/1 – Quantitative Research Design and Statistics in Education 2018
Clemson University

Instructor: EDUC 255 – Diagnostic Classification Models 2017
University of California – Los Angeles

Instructor: EDUC 231C – Categorical Data Analysis 2017
University of California – Los Angeles

Co-instructor: EDUC 288 – Research Apprenticeship Course 2017
University of California – Los Angeles

Instructor: EDUC 230B – Linear Models in Social Sciences: Multiple Regression 2017, 2018
University of California – Los Angeles

Instructor: EDUC 230A – Introduction to Research Design and Statistics 2016, 2017
University of California – Los Angeles

Teaching Assistant: ERSH 8310 – Applied Analysis of Variance in Education 2013 – 2015
University of Georgia

Undergraduate Courses

Instructor: MTH 217 – Business Calculus 2012
Central Michigan University

GRE Mathematics Preparatory Instructor 2011 – 2012
Central Michigan University Ronald E. McNair Scholars

Instructor: MTH 105 – Intermediate Algebra 2009 – 2011
Central Michigan University

Instructor: MTH 055 – Beginning Algebra 2010
Central Michigan University

Supplemental Instruction Leader: MTH 141 – Calculus I 2006 – 2009
University of South Carolina

Professional Development Training Sessions/Workshops

Bradshaw, L., & **Madison, M. J.** (April, 2018). *Diagnostic Classification Models Part I: Fundamentals*. Half-day training session presented at the annual meeting of the National Council on Measurement in Education in New York, NY.

Madison, M. J., & Bradshaw, L. (April, 2018). *Diagnostic Classification Models Part II: Advanced Applications*. Half-day training session presented at the annual meeting of the National Council on Measurement in Education in New York, NY.

Bradshaw, L., & **Madison, M. J.** (April, 2017). *Diagnostic Measurement: Theory, Methods and Applications*. Full day training session presented at the annual meeting of the National Council on Measurement in Education in San Antonio, TX.

Mentorship

Postdoctoral Research Associate Supervisor

In Progress

Meghan Sullivan, UCLA + National University Precision Institute

Ph.D. Dissertation Co-Chair
In Progress
Eric Setoguchi, Social Research Methodology, UCLA

Ph.D. Dissertation Committee Member
In Progress
Anne Blackstock-Bernstein, Human Development and Psychology, UCLA

Second Year Project Committee Member
In Progress
An Cho, Human Development and Psychology, UCLA

Honors and Awards

Outstanding Dissertation Award Nominee 2018
American Educational Research Association, Division D

Owen W. Scott Award for Academic Merit and Professional Promise 2015
University of Georgia Department of Educational Psychology

UGA Amazing Student 2014
University of Georgia College of Education

2nd Place: Quantitative Division Poster 2013
Group-mean centering in hierarchical linear models: A weighting approach. Poster presented at the 2013 College of Education Graduate Student Research Conference in Athens, GA.

Outstanding Tutor Honorable Mention 2012
Central Michigan University Department of Mathematics

Outstanding Teaching Assistant 2011
Central Michigan University Department of Mathematics

Emerging Scholar Award 2008
University of South Carolina Ronald E. McNair Scholars Program

Service Activities/Leadership Positions

Quantitative Methodologist Search Committee 2018 – Present
Clemson College of Education
Department of Education and Human Development

Program Chair 2018 – Present
American Educational Research Association
Special Interest Group 167: Cognition and Assessment

Outstanding Dissertation Committee 2018 – Present
American Educational Research Association, Division D

Membership Chair 2017 – Present
Northeastern Educational Research Association

Core Faculty Member 2017 – 2018
UCLA Department of Education
Educational Leadership Program

Academic Personnel Committee 2017 – 2018
UCLA Department of Education

Faculty Search Committee 2017 – 2018
UCLA Department of Psychology

California State University Sally Casanova Pre-Doctoral Scholars Program 2017
Undergraduate Research Faculty Mentor

Membership Committee 2016 – 2017
Northeastern Educational Research Association

DCMNET: Diagnostic Classification Model Network 2016 – Present
Listserv Owner and Operator

Standards and Test Use Committee 2015 – 2016
National Council for Measurement in Education

Project U-SPARC: Math Hall and Ball Co-director 2015
University of Georgia / Howard B. Stroud Elementary

The 2014 Frasier Equity & Excellence STEM Conference Planning Committee 2014 – 2015
University of Georgia, College of Education

Graduate Student Liaison 2013 – 2016
American Educational Research Association
Special Interest Group 167: Cognition and Assessment

Mathematics Curriculum Team 2013 – 2015
University of Georgia

Training and Professional Development Committee 2013 – 2014
National Council for Measurement in Education
Graduate Student Representative

Graduate Researchers in Educational Psychology
University of Georgia
Executive Committee: Treasurer 2013 – 2014
Program Representative: Quantitative Methodology 2012 – 2013

Other Professional Activities

Graduate Assistant 2015 – 2016
Developing Enhanced Assessment Tools for Capturing Students' Procedural Skills and Conceptual Understandings in Mathematics. United States Department of Education, Institute of Educational Sciences: Cognition in Special Education, Measurement Goal 5.

Psychometric Intern Summer 2015
American Institute of Certified Public Accountants

Graduate Assistant 2014 – 2015
Georgia Center for Assessment

Graduate Assistant 2012 – 2014
AutoMentor: Virtual Mentoring and Assessment in Computer Games for STEM Learning. National Science Foundation: Division of Research on Learning.

Software Skills

Fortran, MATLAB, Mplus, Python, R, SAS, SPSS, Visual Studio, Visual Basic

Professional Affiliations

American Statistical Association 2015 – Present
Psychometric Society 2015 – Present
Northeastern Educational Research Association 2013 – Present
American Educational Research Association 2012 – Present
National Council on Measurement in Education 2012 – Present