Dalton D. Marsh

Department of Mathematics
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RESEARCH INTERESTS

I am interested in students' beliefs and attitudes about mathematics and how they relate to identity, interest, and persistence in STEM. I'm also broadly interested in statistics and mathematical modeling education.

EDUCATION

Ph.D. in Mathematics Education May 2020
University of New Hampshire, Durham, NH
Thesis: Am I a Math or Science Person? How High School Students' Attitudes Towards Mathematics and Science Influence Their Decision to Major in STEM

M.S. in Statistics December 2019
University of New Hampshire, Durham, NH
Thesis: Evaluating Bayesian Methods for Handling Missing Data

M.A. in Teaching Mathematics (7–12) June 2015
Union Graduate College (now Clarkson University), Schenectady, NY
Thesis: Improving Mathematical Discourse Through Oral Assessments

M.A. in Mathematics May 2014
University at Albany, State University of New York, Albany, NY

B.A. in Mathematics, magna cum laude May 2012
Alfred University, Alfred, NY

ACADEMIC POSITIONS

Assistant Professor of Mathematics, *California State University, San Bernardino, CA*	2020 – present
Doctoral Research Fellow, *University of New Hampshire, Durham, NH*	2019 – 2020
Graduate Research Assistant, *University of New Hampshire, Durham, NH*	2017 – 2018
Graduate Teaching Assistant, *University of New Hampshire, Durham, NH*	2015 – 2019
Teacher Intern, *Amsterdam High School, Amsterdam, NY*	2014 – 2015
Graduate Teaching Assistant, *University at Albany, SUNY, Albany, NY*	2012 – 2014

AWARDS

Dissertation Year Fellowship, *University of New Hampshire*	AY 2019 – 2020
Leitzel Award in STEM Education Research, *University of New Hampshire*	Spring 2019
Graduate School Travel Grant, *University of New Hampshire*	Fall '18, '19, Spring '19
Outstanding Graduate Teaching Assistant, *University of New Hampshire*	AY 2016 – 2017

PEER-REVIEWED PUBLICATIONS

- **Marsh, D.**, Sharpe, S., & Graham, S. (in preparation). Examining an expectancy-value model of student interest in STEM majors: Do math and science attitudes help to explain gender and racial differences?
- **Marsh. D.** (in preparation). Are STEM-underrepresented students less motivated in mathematics?
- **Marsh, D.** & Linder, E. (revise and resubmit). Handling missing data with state-of-the-art methods: Overview and insights for applied researchers. *Practical Assessment, Research, and Evaluation*.
- **Marsh, D.** (in press). Mathematics identity and gender differences in STEM persistence: A latent growth curve model. Proceedings of the *44th Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA)*.
- Sharpe, S. & **Marsh, D.** (2022). A systematic review of factors associated with high schoolers' algebra achievement according to HSLS:09 results. *Educational Studies in Mathematics*. https://doi.org/10.1007/s10649-021-10130-4
- **Marsh, D.** & Sharpe, S. (2020). Gender differences in attitudes towards mathematics and STEM major choice: The importance of mathematics identity. In Sacristán, A.I., Cortés-Zavala, J.C. & Ruiz-Arias, P.M. (Eds.). *Mathematics Education Across Cultures: Proceedings of the 42nd Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Mexico* (pp. 1390-1394). Cinvestav / AMIUTEM / PME-NA. https://doi.org/10.51272/pmena.42.2020-215
- **Marsh, D.** & Sharpe, S. (2020). Attitudes toward mathematics and STEM major choice: The roles of self-efficacy, identity, interest, and utility. *AERA Online Paper Repository for the 2020 Annual Meeting of the American Educational Research Association*. https://doi.org/10.3102/1573909
- Sharpe, S. & **Marsh, D.** (2019). A systematic review of factors related to high schoolers' algebra achievement according to the High School Longitudinal Study 2009 results. *AERA Online Paper Repository for the 2019 Annual Meeting of the American Educational Research Association*. https://doi.org/10.3102/1436203
- Sharpe, S. & **Marsh, D.** (2018). Exploring factors related to high schoolers' algebra achievement: A review of dissertations using HSLS:09 data. In T. E. Hodges, G. J. Roy, & A. M. Tyminski (Eds.), *Proceedings of the 40th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 211–214). Greenville, SC: University of South Carolina & Clemson University.

PRESENTATIONS

Research Presentations

- Mathematics identity and gender differences in STEM persistence: A latent growth curve model. Brief research report to be presented at the *44th Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA)*, Nashville, TN, November 2022.
- Assessing students' self-perceptions and habits of mind in STEM. Invited talk for the *CSU STEM-NET Webinar on STEM Program Assessment and Evaluation*, virtual, July 2022.

- Are STEM-underrepresented students less motivated in mathematics and science? Research paper presented at the 2022 *International Conference on Humanities, Social and Education Sciences (iHSES)*, virtual, April 2022.
- Defining and measuring social-psychological factors in STEM education. Invited talk for the *CSUSB College of Natural Sciences Culturally Responsive Teaching Faculty Learning Community*, CSUSB, January 2022.
- Student interest and persistence in STEM: Do math attitudes explain gender, racial, and SES differences? Colloquium presentation for the *CSUSB Mathematics Department Colloquia*, CSUSB, October 2021.
- Student interest and persistence in STEM. Invited talk for *CSU STEM-NET Virtual Research Café*, July 2021.
- Gender differences in attitudes towards mathematics and STEM major choice: The importance of mathematics identity (with S. Sharpe). Brief research report presented at the *42nd Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA)*, virtual (due to COVID-19), June 2021.
- Attitudes towards mathematics and STEM major choice: The roles of self-efficacy, identity, interest, and utility (with S. Sharpe). Paper accepted for the *2020 American Educational Research Association of America (AERA) Annual Meeting*, canceled (due to COVID-19), April 2020.
- Attitudes towards mathematics and motivation in STEM: A quantitative analysis of a nationally representative sample of high schoolers. *University of New Hampshire Graduate Research Conference*, Durham, NH, April 2019.
- How attitudes towards mathematics and science motivate high schoolers' STEM achievement, course taking, and major plans. Invited graduate student research round table session at the *2019 American Educational Research Association of America (AERA) Annual Meeting*, Toronto, Canada, April 2019.
- A HSLS:09 systematic review of factors related to high schoolers' algebra achievement (with S. Sharpe). Round table session presented at the *2019 American Educational Research Association of America (AERA) Annual Meeting*, Toronto, Canada, April 2019.
- Exploring factors related to high schoolers' algebra achievement: A review of dissertations using HSLS:09 data (with S. Sharpe). Brief research report presented at the *40th Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA)*, Greenville, SC, November 2018.
- What leads students to STEM majors? Instructional practices, attitudes towards math and science, and differences across underrepresented groups. *University of New Hampshire Graduate Research Conference*, Durham, NH, April 2018.
- Exploring factors related to high schoolers' algebra achievement (with S. Sharpe). Paper presented at the *2018 National Council of Teachers of Mathematics (NCTM) Research Conference*, Washington, DC, April 2018.

Pedagogy Presentations

- Getting meta about questioning: Going beyond closed- verses open-ended. Poster presented at the 2022 International Learning Assistant Conference (ILAC), Boulder, CO, November 11, 2022.

- Flop or Not? Exploring and modeling with movie data (with S. Balady). Teacher workshop session presented at the 2022 California Mathematics Council-South (CMC-South) Conference, Palm Springs, CA, November 4, 2022.
- Exploring and modeling with movie and crime data (with S. Balady). Teacher workshop session presented for Inland Empire Math Teacher's Circle's *Dinner and a Math Problem*, CSUSB, October 12, 2022.
- Mathematical modeling: The emphasis is on the process. Invited speaker session for *Oregon State University Math Education Seminar*, virtual, May 17, 2022.
- What size shoe would Lady Liberty wear? Mathematical modeling through inquiry (with J. Aikin). Teacher workshop session presented for Inland Empire Math Teacher's Circle's *Dinner and a Math Problem*, CSUSB, March 9, 2022.
- Building a classroom culture of openness to ask questions, share ideas, and make mistakes. Roundtable session presented at *CSUSB Pedagogy Forum*, virtual, May 2021.
- Incorporating inquiry-based learning (IBL) in your class, TA workshop session presented at *Graduate Teaching Seminar*, University of New Hampshire, November 2019.
- Incorporating active learning in your class, TA workshop session presented at *Graduate Teaching Seminar*, University of New Hampshire, September 2019.
- Proportional reasoning (with N. Portnoy. & D. Fifty). Teacher workshop session presented at *STEM Educators Summit*, University of New Hampshire, Manchester, May 2016.

PROFESSIONAL ACTIVITES

K–12 Outreach

- Assistant Coordinator - *Noyce Math and Science Teacher Scholar Program*, CSUSB and San Bernardino City Unified School District, CSUSB NSF Noyce, Spring 2021–Present.
- Co-Director and Advisor - *Early Teaching Experiences in Mathematics and Science (ETEMS)*, CSUSB NSF Noyce, Spring 2021–Present.
- Math night facilitator - *Dinner and a Math Problem*, Inland Empire Math Teachers' Circle, Inland Counties Mathematics Project, three math nights co-led since Spring 2022.
- Lesson study facilitator - *Big Bear High School*, Fall 2022.
- Volunteer assistant for grades 6-8 *MATHCOUNTS* Chapter Competition at the University of New Hampshire, 2017 and 2019.

Diversity, Equity, and Inclusion (DEI) Initiatives

- Core Team Member for Campus - *Accelerate Latinx Representation in STEM Education (ALRISE)* with Institutional Intentionality and Capacity Building for Experiential Learning, NSF INCLUDES Alliance, Spring 2022–Present.
- Co-Organizer - Advocating for Students of Color in Mathematics, CSUSB Mathematics Department DEI Faculty Learning Community, 2021-Present.
- Summer Enrichment Program Instructor, *Louis Stokes Alliance for Minority Participation (LSAMP)*, CSUSB, Summer 2021, 2022.

- Discussant - Antiracist Working Group, University of New Hampshire Department of Mathematics and Statistics, Summer 2020.

TA Professional Development and Coordination

- Serving as the faculty advisor to Graduate Teaching Associates for concerns related to their teaching assignments, performing classroom observations and debriefing meetings, interviewing and selecting candidates, CSUSB, Fall 2021–Present
- Assisted in orientation for incoming TAs by moderating teaching demonstrations and serving as a senior TA for Q&A sessions, presented seminar talks and demonstrations on best practices for teaching, University of New Hampshire, 2017–2020.

Curriculum Development

- Mathematics Education Research Consultant - *Building College-Level Number Sense with Adaptive Technology*, CSUSB and Riverside City College, California Education Learning Lab, Summer 2020–Present.
- Quality Assurance for advanced mathematics - Shmoop, 2016.

Editorial Work/Peer Review

- Assistant Editor, Journal of the California Mathematics Project.
- Review for Conference Proposals
    - 2020, 2021, and 2022 Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA).
    - 2020 Annual Meeting of the New England Educational Research Organization (NEERO).
    - 2018 National Council of Teachers of Mathematics (NCTM) Research Conference.

Other

- PI - *Dissertation Year Fellowship* ($22,100 awarded), How Learning Experiences Shape High Schoolers' Motivational Attitudes Towards STEM: Examining Achievement, Course-Taking, and Major Plans, University of New Hampshire Gradate School, AY 2019–2020.
- Statistics Consultant, UNH Statistical Consulting Service, University of New Hampshire, 2018.
- Working group member for Collaborative for Research at the Interface of STEM Teaching and Learning (CRISTaL), University of New Hampshire, AY 2017–2018.

TEACHING

Graduate Courses

California State University, San Bernardino

- Teaching Practicum (MATH 6178) - Fall 2020, Fall 2021

University of New Hampshire

- Probability and Statistics for Teachers (MATH 909) - Summer 2019

Undergraduate Courses

California State University, San Bernardino

- Senior Seminar for Mathematics Educators (MATH 5900) - Fall 2021, Spring 2022, Fall 2022
- Problem Solving for Teachers II (MATH 4900) - Fall 2020, Spring 2021
- Intro to Math/Science Pedagogy (NSCI 3040) – Fall 2022
- Preparation for Calculus A (MATH 1402) - Fall 2020, Spring 2021
- Introduction to Statistical Thinking A (MATH 1202) - Spring 2021

University of New Hampshire

- Statistical Discovery for Everyone (MATH 439) - Fall 2017, Fall 2018
- Analysis & Application of Functions (MATH 418) - Spring 2016
- Analysis of Secondary School Math (MATH 624) - Spring 2018 (Volunteer)
- Statistics for Engineers and Scientists (MATH 644) - Spring 2018 (Teaching Assistant)
- Honors/Calculus II (MATH 426H) - Spring 2017 (Teaching Assistant)
- Honors/Calculus I (MATH 425H) - Fall 2016 (Teaching Assistant)
- Analysis & Application of Functions (MATH 418) - Fall 2015, Spring 2019 (Teaching Assistant)

University at Albany, SUNY

- Algebra and Calculus I (AMAT 101) - Fall 2013
- Elementary Statistics (AMAT 108) - Spring 2013, Spring 2014 (Teaching Assistant)

Other Teaching

Independent Studies - *California State University, San Bernardino*

- Rough Draft Math - Fall 2021
- Mathematical Modeling for Secondary Teachers - Spring 2020

Grades 9–12 - *Amsterdam High School*

- AP Calculus AB - AY 2014–2015 (Teacher in Residence)
- Common Core Algebra - AY 2014–2015 (Teacher in Residence)

Pedagogical Training

- Culturally Responsive Teaching Faculty Learning Community, Investigating Student Success Using Evidence-Based Strategies–Expanded (ISSUES-X), CSUSB, AY 2021-2022.
- New Faculty Learning Community, Investigating Student Success Using Evidence-Based Strategies–Expanded (ISSUES-X), CSUSB, Fall 2020.
- Teaching Online Using the Quality Teaching and Learning (QLT) Instrument, Academic Technology and Innovation (ATI), Summer Virtual Teaching Institute (SVTI), CSUSB, Summer 2020.
- New York State Initial Teaching Certificate in Mathematics, Grades 7–12, 2015–2020 (expired).

ACTIVE MEMBERSHIPS

- National Council of Teachers of Mathematics (NCTM).
- North American Chapter of the International Group for the Psychology of Mathematics Education (PME–NA).
- Community for Mathematics Inquiry in Teaching–California/Nevada Region (COMMIT–CaN).
- California Mathematics Council–South (CMC–South).

STATISICAL EXPERTISE

- Software: R, JMP, SPSS, Mplus, Blimp, CODAP
- Techniques: Structural equation modeling, multilevel modeling, analysis with missing data