Frederick A. Peck

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PROFESSIONAL EXPERIENCE

2015-Presnt	Assistant professor Department of Mathematical Sciences, University of Montana
2013-2015	Instructor School of Education, University of Colorado
2006-2012	Math teacher Centaurus High School, Lafayette CO

EDUCATION

2015	PhD	University of Colorado Boulder Curriculum and instruction, Mathematics education Dissertation title: The intertwinement of activity and artifacts: A cultural perspective on Realistic Mathematics Education
2006	MA	University of Colorado Boulder Curriculum and instruction: Math education Coursework in mathematics equivalent to an undergraduate major in mathematics
2002-2004	PhD Student	University of Michigan Human Computer Interaction
2001	BA	Carnegie Mellon University Business administration: Computing and information technology, awarded with University Honors

AREAS OF INTEREST AND SPECIALIZATION

Mathematics education, realistic mathematics education, algebra, sociocultural approaches to human learning, mathematics for social justice, design research, discourse analysis, psychometrics and educational measurement

PUBLICATIONS

Journal publications

2016 **Peck, F.A.** & Matassa M. (2016). Reinventing fractions and division as they are used in algebra: The power of preformal productions. *Educational Studies in Mathematics, 92,* 2, 245-278. doi: 10.1007/s10649-016-9690-y

2015 Briggs, D. and **Peck, F.A.** (2015). Rejoinder to commentaries on Using learning progressions to design vertical scales that support coherent inferences about student growth. *Measurement: Interdisciplinary Research and Perspectives 13*, 3-4, 206-218

2015 * Briggs, D. and **Peck, F.A.** (2015). Using learning progressions to design vertical scales that support coherent inferences about student growth. *Measurement: Interdisciplinary Research and Perspectives 13*, 2, 75-99

* Focus article. Commentaries from Jere Confrey; Seth Jones, & Garron Gianopulus; Andrew Ho; Neal Kingston, Angela Broaddus & Hongling Lao; Andrew Maul; Joshua McGrane; Scott Marion; Joseph Martineau & Adam Wyse; William Penuel; David Thissen

2015 * O'Conner, K., **Peck, F.A**., and Cafarella, J. (2015) Struggling for legitimacy: Filiation work in the sorting of engineering students. *Mind, Culture, and Activity 22*, 2, 168-183

* Special issue dedicated to the work of Susan Leigh Star, edited by Geoff Bowker

2013 Migozuchi, T., **Peck, F.A.**, & Matassa, M. (2013). Developing robust understandings of slope. *Elementary mathematics teaching today, 511*. 31-32.

2010 Bhavnani, S.K., and **Peck, F.A.** (2010). Scatter matters: Regularities and implications for the scatter of healthcare information on the web. *Journal of the American Society for Information Science and Technology 61*, 4, 659–676.

2008 Bhavnani, S.K., **Peck, F.A.,** and Reif, F. (2008). Strategy-Based Instruction: Lessons learned in teaching the effective and efficient use of computer applications. *ACM Transactions on Computer-Human Interaction 15*, 1, 2:1-2:43.

2006 Bhavnani, S.K., Bichakjian, C.K., Johnson, T.M., Little, R.J., **Peck, F.A.**, Schwartz, J.L., and Strecher, V.J. (2006). Strategy Hubs: Domain portals to help find comprehensive information. *Journal of the American Society for Information Science and Technology 57*, 1, 4-24.

Journal publications *in review*

2016 **Peck, F.A.** (2016, in review). Rejecting Platonism: Recovering the humanity in mathematics education. In review at *Mathematics Teacher Educator*.

Peer-reviewed papers published in conference proceedings

2016 (to appear) **Peck, F.A.**, O'Connor, K., Cafarella, J., & McWilliams, J. (2016, November). How borders produce persons: The case of calculus in engineering school. Accepted for *Proceedings of the 2016 meeting of Psychology of Mathematics Education—North America.* Tucson, AZ.

2016 O'Connor, K., **Peck, F.A.**, McWilliams, J. & Cafarella, J. (2016, June). Working in the weeds: How do instructors sort engineering students from non-engineering students in a first year pre-calculus course? *Proceedings of the 2016 American Society for Engineering Education Annual Conference and Exposition*, New Orleans, LA.

2015 O'Connor, K., **Peck, F.A.**, & Cafarella, J. (2015). Constructing "calculus readiness": Struggling for legitimacy in a diversity-promoting undergraduate engineering program. *Proceedings of the 2015 American Society for Engineering Education Annual Conference and Exposition*, Seattle, WA: ASEE. 26.397.1-26.397.17

2015 O'Connor, K., McWilliams, J., **Peck, F.A.**, & Cafarella, J. (2015, to appear). Ideologies of depoliticization in engineering education: A Mediated Discourse Analysis of student presentations in a first-year projects course *Proceedings of the 2015 American Society for Engineering Education Annual Conference and Exposition*, Seattle, WA: ASEE. 26.880.1-26.880.17

2012 **Peck, F.A.** & Matassa M. (2012). Ratio and rate: Towards a unified framework. *Proceedings of the 12th International Conference on Mathematics Education.* Seoul, Korea

2012 Matassa, M. & **Peck, F.A.** (2012). Rise over run or rate of change? Exploring and expanding student understanding of slope in Algebra I. *Proceedings of the 12th International Congress on Mathematics Education*. Seoul, Korea. 7440-7445.

2006 Bhavnani, S.K., and **Peck, F.A.** (2006). Towards a model of information scatter: Implications for search and design. *Proceedings of the 2006 meeting of the American Society for Information Science and Technology*.

2004 **Peck, F.A.**, Bhavnani, S.K., Blackmon, M.H., and Radev, D.R. (2004). Exploring the use of natural language systems for fact identification: Towards the automatic construction of healthcare portals. *Proceedings of the 2004 meeting of the American Society for Information Science and Technology*, 327-338.

2003 Bhavnani, S.K., Bichakjian, C.K., Johnson, T.M., Little, R.J., **Peck, F.A.**, Schwartz, J.L., and Strecher, V.J. (2003). Strategy Hubs: Next-generation domain portals with search procedures. *Proceedings of the 2003 ACM CHI conference on Human Factors in Computing Systems*, 393-400.

2003 Bhavnani, S.K., Jacob, R.T., Nardine, J., and **Peck, F.A.** (2003). Exploring the distribution of online healthcare information. *Proceedings of the 2003 ACM CHI conference on Human Factors in Computing Systems*, 816-817.

Book chapters

2016 (in press) Webb, D.C, Matassa, M.M., & **Peck, F.A.** (2016, in press). From tinkering to systemic innovation: The role of teachers in the guided redesign of Realistic Mathematics Education in the United Students. To appear in *Reflections from abroad on the Netherlands didactic tradition in mathematics education*.

Peer-reviewed conference presentations

2016 **Peck, F.A.** (2016, April). *The intertwinement of activity and artifacts in Realistic Mathematics Education*. Presented at the National Council for Teachers of Mathematics Research Conference. San Francisco, CA.

2016 * Johnson, R.J., **Peck, F.A.**, Briggs, D. & Alzen, J. (2016, April). *A unified framework of teachers' conceptions of learning and assessment*. Presented at the National Council for Teachers of Mathematics Research Conference. San Francisco, CA.

* Johnson and Peck, co-first authors

2016 Briggs, D.C & **Peck, F.A** (2016, April). *Enacting a learning progression design to measure growth* (symposium, opening presentation). Presented at the Annual Meeting of the National Council on Measurement in Education. Washington, DC

2016 O'Connor, K., **Peck, F.A.**, Cafarella, J. & McWilliams, J. (2016, April). Producing calculus (un)readiness. Presented at the Annual Meeting of the American Educational Research Association. Washington, DC.

2015 O'Connor, K., Cafarella, J., McWilliams, J. & **Peck, F.A.**, (2015, October) *Struggling for legitimacy in engineering education.* Presented at the Annual meeting of the American Anthropological Association. Denver, CO.

2015 **Peck, F.A.** (2015, September). *Emergent modeling: From chains of signification to cascades of artifacts*. Presented at the Fifth International Realistic Mathematics Education Conference, Boulder, CO, Sept 17-20.

2015 * Johnson, R.J., **Peck, F.A.,** Campbell, W.C, Grover, R., Miller, S., & Scroggins, A. (2015, September). *An orientation to Realistic Mathematics Education*. Presented at the Fifth International Realistic Mathematics Education Conference, Boulder, CO, Sept 17-20.

* Johnson and Peck, co-first authors and session organizers

* Invited plenary talk

2015 **Peck, F.A.** (2015, April). *Activity situates: How epistemic mathematical activity and social organizations become dialectically intertwined in the mangle of conceptual practice*. Presented at the Annual Meeting of the American Educational Research Association. Chicago, IL.

2015 * Cafarella, J., & **Peck, F.A. *** (2015, April), *Decentering dominant discourses and reimagining privileged spaces in STEM education.* Annual Meeting of the American Educational Research Association (Nancy Aers, chair; Megan Bang, discussant). Chicago, IL.

* Cafarella and Peck, session organizers

2015 Briggs, D.C., **Peck, F.A.**, Alzen, J. & Johnson, R.J. (2015, April). *Implementing a learning progression-based approach to Student Learning Objective development: Results from a pilot test in three schools.* Presented at the Annual Meeting of the American Educational Research Association. Chicago, IL.

2014 **Peck, F.A.** (2014, April). *Beyond rise over run: A local instructional theory for slope.* Presented at the National Council for Teachers of Mathematics Research Conference. New Orleans, LA

2013 **Peck, F.A.** (2013, September). *How does reinvention get distributed?* Presented at the Fourth International Realistic Mathematics Education Conference. Boulder CO

2013 **Peck, F.A.** (2013, September). *Beyond rise-over-run: Contexts, representations, and a learning trajectory for slope*. Presented at the Fourth International Realistic Mathematics Education Conference. Boulder CO

2013 **Peck, F.A.** (2013, April). *"I think it's a hundred and fifteen dollars": How mathematical activity and the social setting are mutually informing and co-constitutive.* Poster presented at the 2013 National Council for Teachers of Mathematics Research Conference. Denver, CO

2011 **Peck, F.A.,** and Moeller, J. (2011, September). *Length times width equals area and line times line equals parabola: Incorporating two RME models into a cohesive learning trajectory for quadratic functions*. Presented at the Third International Realistic Mathematics Education Conference. Boulder CO

Reports and working papers

2015 Briggs, D.C., Diaz-Bilello, E., **Peck, F.A.**, Alzen, J., Chattergoon, R., & Johnson, R. (2015). *Using a Learning Progression Framework to Assess and Evaluate Growth*. Center for Assessment, Design, Research and Evaluation (CADRE) Working Paper.

2015 Briggs, D.C., **Peck, F.A.**, Johnson, R., & Alzen, J. (2015). *The Learning Progression Project: Year 2 pilot findings: Mathematics.* Center for Assessment, Design, Research and Evaluation (CADRE). Report for Denver Public Schools.

2014 Briggs, D.C., Diaz-Bilello, E., **Peck, F.A.**, Alzen, J., Chattergoon, R., & McClelland, A. (2014). *Tier 3 Student Learning Objective Pilot: Documentation of Pilot Work and Lessons Learned in the 2013- 2014 School Year*. Center for Assessment, Design, Research and Evaluation (CADRE). Report for Denver Public Schools.

AWARDS AND FELLOWSHIPS

2011 Chancellor's fellow, University of Colorado Boulder
(The most prestigious fellowship offered by the University)

2009 Teacher of the year, Centaurus High School, Lafayette, CO

GRANTS AND EXTRAMURAL FUNDING

2015-2016	$109,000	Montana Math Teachers' Circle Funder: Montana Office of the Commissioner of Higher Education – Award Number S367B140023-14A
2016-2017	$5,000	Exploring Math Teachers' Circles Funder: University of Montana Grants Program
2008-2010	$65,000	Double-dose of mathematics for struggling learners Funder: Impact on Education

INVITED TALKS AND SESSION CHAIRS

2015 An orientation to Realistic Mathematics Education (Plenary talk). *Fifth International Realistic Mathematics Education Conference*. Boulder CO

2015 Investigations into elementary students' mathematical thinking (Invited chair). *Annual Meeting of the American Educational Research Association*. Chicago, IL

2015 Using models to solve math problems: The area model (Invited talk). *Courage to Risk Conference*. Colorado Springs, CO (Jan 2015)

2015 Using models to solve math problems: The number line (Invited talk). *Courage to Risk Conference*. Colorado Springs, CO (Jan 2015)

2015 Using models to solve math problems: The ratio table (Invited talk). *Courage to Risk Conference*. Colorado Springs, CO (Jan 2015)

TEACHING

2015-present	Assistant professor, University of Montana Courses taught: M132, Number and operations for elementary teachers (Fall 2015, Spring 2016, Fall 2016; Level: Undergraduate) M500, Contemporary mathematics curricula (Spring, 2016; Level: Masters and PhD) M572, Algebra for middle school teachers (Summer, 2016; Level: Masters) M602, Teaching college mathematics (Fall 2016; Level: Masters and PhD)
2013-2015	Instructor, University of Colorado Courses taught: Statistical reasoning (Fall 2013, Fall 2014; Level: Incoming PhD students); EDUC 5375, Problem-based instruction for math and science teachers (Spring 2015; Level: undergraduate and post-BA)
2002-2004	Graduate student instructor, University of Michigan Courses taught: Strategic use of computer applications (Level: Undergraduate)
2006-2012	Math teacher, Centaurus High School, Lafayette CO Courses taught: Calculus III (as a student teacher), AP calculus AB & BC, IB math HL, IB math SL, Algebra I, Math workshop Grades: 9-12

Professional development for teachers

2015-present	University of Montana Title: Montana Math Teachers' Circle
2013-2015	Denver Public School District and University of Colorado Title: The learning progressions project: Making SLOs meaningful
2014-2015	Cherry Creek School District Title: SLD Intervention Workshops: Accessing grade-level content
2015	Colorado Council for Learning Disabilities Title: Understanding structure to aid in mathematical problem-solving
2014	Colorado Department of Education Title: Algebraic reasoning for students with SLD
2014	Colorado Council for Learning Disabilities Title: Using mathematical models to do and learn mathematics

2013 Colorado Council for Learning Disabilities
Title: The five faces of fractions and rational numbers

RESEARCH PROJECTS

2016-present Principal Investigator
Project tile: Exploring student learning in Algebra II
Description: Design study exploring the ways that students make sense of quadratic functions as multiplicative objects.

2016-present Principal Investigator
Project title: Exploring Math Teachers' Circles
Description: Field-based ethnography studying identity and community formation in Math Teachers' Circles.

2011-present Principal Investigator
Project title: Rise over run or rate of change: Exploring and expanding student understandings of slope in Algebra I
Description: Design study exploring the ways that students reinvent, make-meaningful, and connect multiple sub-constructs of slope in Algebra I.

2013-present Co-Investigator (2015-present); Graduate research assistant (2013-2015)
Grant title: Inclusive excellence to bolster diversity:
A system of capacity-building pathways to and through engineering
PI: Jacquelyn Sullivan, Kevin O'Connor
Description: Field-based ethnography studying a diversity program in a college of engineering. Collaboration with researchers in the College of Engineering.

2013-2015 Graduate research assistant
Project title: The learning progressions project: Making SLOs useful.
Faculty director: Derek Briggs
Description: Research-practice partnership with an urban school district to develop and study a method of measuring student growth using learning progressions.

2002-2004 Graduate research assistant

Project title: Developing tools to help users find comprehensive healthcare information on the World Wide Web

Faculty director: Suresh Bhavnani

Description: Explored the distribution of healthcare information on the Web; designed, developed, and tested (in a randomized controlled trial) a domain-specific search tool to provide strategic search procedures to help users find comprehensive healthcare information.

SERVICE TO THE DEPARTMENT AND PROFESSION

2012 – Present	Reviewer for: Journal for Research in Mathematics Education (JRME); American Educational Research Association annual conference (AERA); International Conference on the Learning Sciences (ICLS); National Council of Teachers of Mathematics research conference (NCTM); Psychology of Mathematics Education (North American chapter) annual conference (PME-NA); Realistic Mathematics Education conference (RME); Computer Supported Cooperative Learning conference (CSCL)
2016-present	Statewide co-coordinator for the Montana Math Teachers' Circle (manage registration and recruiting, coordinate lead teams at five locations across the state. ~150 participating teachers)
2016-present	Lead team member and facilitator, Missoula chapter of the Montana Math Teachers' Circle
2016-present	Co-organizer and facilitator, Virtual Montana Math Teachers' Circle (online community of Montana math teachers, ~45 participants)
2016	Co-organizer and facilitator, Montana Math Teachers' Circle summer retreat (4-day workshop for teachers, 45 attendees from across Montana)
2016	Co-organizer of the Montana Math Day for secondary students (~250 students from across Western Montana)
2015-present	Session facilitator at Montana Math Day for secondary students. 2016 session title: "STOMP!" 2015 session title: "Friends, enemies, and when we should fight the aliens."
2016	Committee service in the Department of Mathematical Sciences: Graduate committee (Spring, 2016) Policy committee (Spring, 2016)

2016	Volunteer at the Montana State Math Competition, Missoula, MT
2015-present	Mentor for Standards-based Teaching, Renewing Educators Across Montana in Mathematics (STREAM)
2015	Co-organizer of the Montana Math Circle for high school students
2014	Co-author of "Family and community guides to the Colorado Academic Standards," Colorado Department of Education Online: http://www.cde.state.co.us/standardsandinstruction/guidestostandards-6thru12
2013-2015	Steering committee for the *Math on the "planes"* conference, (~200 attendees per year), Colorado Council for Learning Disabilities
2013-2015	Advisory board for PhET interactive simulations, University of Colorado Boulder
2013-2015	Ambassador for the Curriculum & Instruction Math/Science doctoral program, School of Education, University of Colorado Boulder
2007-2012	Boulder Valley School District Curriculum Coordinating Council
2006-2012	Boulder Valley School District Mathematics Curriculum Council

Publications in practitioner (teacher-focused) journals

2016 **Peck, F.A.**, Alzen, J., Briggs, D.C., & Johnson, R.J. (2015) Developing purposeful questions and analyzing student reasoning: Two tools. *Colorado Mathematics Teachers*. Winter, 2016. 18-24.

Presentations at practitioner (teacher-focused) conferences

2016 Johnson, R.J., & **Peck, F.A.** *Modeling your way to understanding with Realistic Mathematics Education*. Presented at the Annual Meeting of the National Council of Teachers of Mathematics. San Francisco, CA. April, 2016

2016 Roscoe, M.B. & **Peck, F.A.** *The Montana Math Teachers' Circle: Mathematical inquiry for teachers*. Presented at the Montana Math/Science Leadership Conference. Bozeman, MT

2014 **Peck, F.A.** *Beyond rise over run: Activities to invent and connect slope's five faces*. Presented at the Annual Meeting of the National Council of Teachers of Mathematics. New Orleans, LA

2014 **Peck, F.A.** *Beyond rise over run: Activities to invent and connect slope's five faces.* Presented at the Annual Meeting of the Colorado Council of Teachers of Mathematics. Denver, CO

2010 **Peck, F.A.,** and Moeller, J. *Length times width equals area and line times line equals parabola: Two models to enable the mathematization of contexts into quadratic functions*. Presented at the Annual Meeting of the Colorado Council of Teachers of Mathematics. Denver, CO

2010 **Peck, F.A.,** and Moeller, J. *From informal models to formal algebra: Using technology to facilitate progressive formalization in Algebra I*. Presented at the Regional Meeting of the National Council of Teachers of Mathematics. Denver, CO

2008 **Peck, F.A.** *Dynamic calculus using Sketchpad*. Presented at the Annual Meeting of the Colorado Council of Teachers of Mathematics. Denver, CO

2008 **Peck, F.A.** *Reading, writing, and 'rithmetic: Incorporating literacy in the math classroom*. Presented at the Annual Meeting of the Colorado Council of Teachers of Mathematics. Denver, CO