

## Teomara Rutherford

### Curriculum Vitae

17282 Chestnut, Irvine, CA

(949) 954-0107

teomara@uci.edu

## EDUCATION

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**Ph.D.** Learning, Cognition, and Development, University of California, Irvine,  
School of Education, Expected 2014

**Dissertation:** Calibration of Confidence Judgments in Elementary Mathematics: Measurement,  
Development, and Improvement

**Committee:** George Farkas (Chair), Greg Duncan, Deborah Vandell, AnneMarie Conley, and  
Elizabeth Loftus

**M.A.** Learning, Cognition, and Development, University of California, Irvine,  
School of Education, 2009-2012

*Advisor: Michael E. Martinez*

**J.D.** Boston University School of Law, *cum laude*, 2000-2003

G. Joseph Tauro Distinguished Scholar, *Boston University Law Review* article editor

Matriculated, Non-Degree Program, University of Texas at Austin, 1998-1999

30 credits in upper-division psychology; neuroscience coursework and research

**B.S.** Elementary Education, Florida International University, 1995-1997

Concentration: Computers in the Classroom; Faculty Scholar Honors Program

## RESEARCH FOCUS

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Individual differences and their influence on mathematics learning.

Design and evaluation of educational interventions, especially those in digital environments.

## RESEARCH POSITIONS

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**Project Manager and Researcher**, Brain Boost, University of California, Irvine, 2010-Present

Brain Boost is an integrated cognitive and motivation intervention aimed at upper elementary and middle school students. Iteratively develop and improve the program based on a combination of high-quality cognitive and motivation interventions. Versions of the program have been implemented with randomized trials in after-school settings and have met with positive results.

Program Creator: Michael Martinez.

**PhD Student Lead**, ST Math at Scale, University of California, Irvine, 2009-Present

IES-funded Goal Three collaborative project with Orange County Department of Education and MIND Research Institute to evaluate ST Math software in a randomized trial at 52 low-performing schools in Southern California. Design and implement data collection including cognitive and motivation assessments and teacher and parent surveys. Lead main effects analysis and work with PhD students and faculty on additional project papers. PI: George Farkas.

**Research Supervisor**, Center for Research in Cognition and Learning, School of Education, University of California, Irvine, 2010-Present

Mentor and supervise 15-40 undergraduate research assistants each quarter in directed research.

**Collaborator**, Working Memory and Plasticity Laboratory, University of California, Irvine, 2013-Present  
Multiple projects on the training of, and individual differences in, working memory and executive control. Projects are funded by US and international agencies. Organize research assistants and project logistics, analyze data, collaborate with other researchers on project design and paper writing. PI: Susanne Jaeggi.

**Project Researcher**, California Motivation Project, University of California, Irvine, 2009-Present  
NSF-funded project on motivation using data from a two-year survey of middle and high school students in their math classes. Analyze data on student motivation, career aspirations, and math achievement. Use social network analysis to investigate the effect of teacher professional learning communities on teacher communication practices. PI: AnneMarie Conley.

## **PUBLISHED & ACCEPTED MANUSCRIPTS**

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**Rutherford, T.**, Farkas, G., Duncan, G., Burchinal, M., Graham, J., Kibrick, M.,... Martinez, M. E. (2014) A randomized trial of an elementary school mathematics software intervention: Spatial-Temporal (ST) Math. *Journal of Research on Educational Effectiveness*. doi: 10.1080/19345747.2013.856978

Schenke, K., **Rutherford, T.**, & Farkas, G. (2014) Alignment of game design features and state mathematics standards: Do results reflect intentions? *Computers & Education*. doi: 10.1016/j.compedu.2014.03.019

**Rutherford, T.** (2013). Emotional well-being and discrepancies between child and parent educational expectations and aspirations in middle and high school. *International Journal of Adolescence and Youth* 1–17. doi:10.1080/02673843.2013.767742

Tran, N. A., Schneider, S., Duran, L., Conley, A. M., Richland, L., Burchinal, M., **Rutherford, T.**, Kibrick, M., Osborne, K., Coulson, A., Antenore, F., Daniels, A., & Martinez, M. E. (2012). The effects of mathematics instruction using spatial temporal cognition on teacher efficacy and instructional practices. *Computers in Human Behavior*, 28(2), 340-349.

**Rutherford, T.**, Lee, D. S., & Martinez, M. E. (2011). Gender, spatial ability, and high-stakes testing. In L. Carlson, C. Hölscher, & T. Shipley (Eds.), *Proceedings of the 33rd Annual Conference of the Cognitive Science Society* (pp. 3237-3242). Austin, TX: Cognitive Science Society.

## **MANUSCRIPTS SUBMITTED & UNDER REVIEW**

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**Rutherford, T.**, Buschkuehl, M., Jaeggi, S. M., & Farkas, G. *A look at Executive Control in the lab, in the classroom, and on real-world measures of achievement*. Under review.

Simzar, R. M., Martinez, M., **Rutherford, T.**, Domina, T., & Conley, A. M., *Raising the stakes: How students' motivation for mathematics associates with high- and low-stakes test achievement*. Submitted.

## **MANUSCRIPTS IN PREPARATION**

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**Rutherford, T.**, Schenke, K., Chang, A., Lee, D. S., Leyrer, J., Young, N. S.,... Martinez, M. *Integrating cognitive and motivation trainings for a "Brain Boost": Development and randomized experiment of a pilot program*.

Chang, A., **Rutherford, T.**, & Schenke, K. *I can do it!: Expectancy as a mediator of the ST Math effect on math achievement*.

**Rutherford, T.** *Relation between calibration of confidence judgments and achievement in elementary mathematics*.

Long, J. J., **Rutherford, T.**, van Es, B., & Farkas, G. (2014, April). *Understanding the relationship between ST Math teacher professional development and its impact on students.*

### **PEER-REVIEWED PRESENTATIONS**

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Simzar, R. M., Martinez, M., Sanabria, T., **Rutherford, T.**, Domina, T., & Conley, A. M. (2014, August). *Student motivation for mathematics and high-stakes versus low-stakes test achievement.* Paper accepted to the annual meeting of the American Psychological Association, Washington, D.C.

Schenke, K., **Rutherford, T.** & Farkas, G. (2014, April). *Linking educational technology to standardized assessments: Game content and features.* Paper accepted to the annual meeting of the American Educational Research Association, Philadelphia, PA.

Chang, A., **Rutherford, T.**, & Farkas, G. (2014, April). *I can do it!: Expectancy as a mediator of the ST Math effect on math achievement.* Paper accepted to the annual meeting of the American Educational Research Association, Philadelphia, PA.

**Rutherford, T.** & Farkas, G. (2014, April). *Evaluation of ST Math treatment effects for special populations and by length of implementation.* Paper accepted to the annual meeting of the American Educational Research Association, Philadelphia, PA.

Long, J. J., **Rutherford, T.**, van Es, B., & Farkas, G. (2014, April). *Understanding the relationship between ST Math teacher professional development and its impact on students.* Paper accepted to the annual meeting of the American Educational Research Association, Philadelphia, PA.

Johnson, L. G.\*, **Rutherford, T.**, & Lee, D. S. (2013, May). *Association between working memory training games and assessments.* Paper presented at the 25th annual meeting of the Association for Psychological Science, Washington, D.C.  
\*indicates mentored undergraduate student

**Rutherford, T.**, Lee, D. S., Schenke, K., Chang, A., Tran, C., Young, N. S., Conley, A. M.,...Martinez, M. E. (2013, April). *Brain Boost: Randomized trial of a program to enhance intelligence in elementary and middle school.* Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

**Rutherford, T.**, Schenke, K., Conley, A. M., & Martinez, M. E. (2012, August). *The association between math test scores, math expectancy, and cognitive abilities.* Paper presented at the annual meeting of the American Psychological Association, Orlando, FL

Schenke, K., Chang, A., **Rutherford, T.**, Lee, D. S., Tran, C., Hinga, B., & Martinez, M. E. (2012, August). *Development, implementation, and evaluation of Brain Boost: A model for modifying direct cognitive ability in an engaging after school environment.* Paper presented at the annual meeting of the American Psychological Association, Orlando, FL

Forrester, L. D.\*, **Rutherford, T.**, & Martinez, M. E. (2012, March). *Using the right words for reasoning: Relationships between specific word use and inductive reasoning.* Paper presented at the biennial meeting of the Society for Research on Adolescence, Vancouver, British Columbia, Canada.  
\*indicates mentored undergraduate student

**Rutherford, T.**, Burchinal, M., Farkas, G., Graham, J.D., Kibrick, M., Long, J.J.,...Martinez, M.E. (2012, April). *Main and differential effects of a computer-assisted math intervention.* Paper presented at the annual meeting of the American Educational Research Association, Vancouver, British Columbia, Canada.

Sheppard, A, Safavian, N., **Rutherford, T.**, Albarran, A. S., & Conley, A. M. (2012, April). *Social network analysis of communication patterns within professional learning communities.* Paper

presented at the annual meeting of the American Educational Research Association, Vancouver, British Columbia, Canada.

**Rutherford, T.** (2011, December). *Illustration of program evaluation: ST Math randomized field trial*. Paper presented at the annual meeting of the California Educational Research Association, Anaheim, CA.

**Rutherford, T., Hinga, B., Chang, A., Conley, A. M., & Martinez, M. E.** (2011, August). *The effect of ST Math software on standardized test scores via improvement in mathematics expectancy*. Paper presented at the annual meeting of the American Psychological Association, Washington, D.C.

**Rutherford, T., Lee, D. S., & Martinez, M. E.** (2011, July). *Gender, spatial ability & high-stakes testing*. Paper presented at the annual meeting of the Cognitive Science Society, Boston, MA.

Long, J. J., **Rutherford, T., Richland, L. E., Graham, J. D., Antenore, F., Coulson, A., & Martinez, M.E.** (2011, May) *Fidelity of implementation in ST Math*. Paper presented at the Science of Student Success Conference of the Learning & the Brain Society, Chicago, IL.

Lee, D.S., **Rutherford, T., Hinga, B., Graham, J. D., & Martinez, M.** (2011, May) *Brain Boost: A model for direct cognitive enhancement*. Paper presented at the Science of Student Success Conference of the Learning & the Brain Society, Chicago, IL.

**Rutherford, T., Graham, J. D., Kibrick, M., Burchinal, M., Lee, D. S., Long, J. J., ... Martinez, M. E.** (2011, April). *Change in standardized test scores in response to an individualized math intervention*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, Louisiana.

**Rutherford, T., Conley, A. M., & Karabenick, S. A.** (2011, April). *Achievement goal orientations and preference for competitive careers*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, Louisiana.

Sheppard, A, Safavian, N., **Rutherford, T., Albarran, A. S., & Conley, A. M.** (2011, April). *A social network analysis of teachers' professional learning communities*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, Louisiana.

**Rutherford, T., Conley, A. M., & Karabenick, S. A.** (2011, March). *Motivationally blessed? Motivation and achievement among gifted and propensity score matched comparison group*. Paper presented at the annual meeting of the Society for Research in Child Development, Montreal, Canada.

**Rutherford, T., Kibrick, M., Burchinal, M., Richland, L. E., Conley, A. M., Osborne, K., ... Martinez, M. E.** (2010, May). *Spatial temporal mathematics at scale: An innovative and fully developed paradigm to boost math achievement among all learners*. Paper presented at the annual meeting of the American Educational Research Association, Denver CO.

**Rutherford, T.** (2010, June). *Emotional well-being and matches between child and parent educational aspirations and expectations*. Paper presented at the PSID CDS III New Directions Workshop, Ann Arbor, Michigan.

Kibrick, M., **Rutherford, T., Burchinal, M., Richland, L. E., Conley, A. M., Long, J. J., ... Martinez, M. E.** (2010, June). *The effects of ST Math on standardized test scores: A randomized field study*. Paper presented at the Fifth Annual IES Research Conference, Washington, DC.

## **PUBLICATIONS IN OTHER AREAS**

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**Rutherford, T.** (2009, October). Copyright the wrongs: Legal concepts every photographer should know. *Design Aglow, 1*(9). Available from <http://designaglow.com>

**Rutherford, T., & Warneck, S.** (2002) Offender-victim contact. In *Bench Book on Children and the Courts; Improving Court Responses to Child Victims of Intra-familial Violence and Sexual Abuse*. Boston, MA: Children's Law and Policy Initiative.

**Rutherford, T., & Warneck, S.** (2002) Non-offending guardians. In *Bench Book on Children and the Courts; Improving Court Responses to Child Victims of Intra-familial Violence and Sexual Abuse*. Boston, MA: Children's Law and Policy Initiative.

## RESEARCH FUNDING

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- 20011-14** National Science Foundation Graduate Research Fellowship. STEM Education, *Training Elementary Math Students to Effectively Monitor Learning* (DGE-0808392). (\$132,000).
- 2012** University of California, Irvine, Newkirk Center for Science & Society. Graduate Student Research Fellowship, *Design and Evaluation of Brain Boost*. (Honorable Mention: \$1,000).
- Submitted** John Templeton Foundation. *Creativity in Learning: The Power of Prediction*. PI: Barbara Sarnecka (Co-Investigator, \$486,942).

## HONORS AND AWARDS

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- 2013** University of California, Irvine Public Impact Distinguished Fellow
- 2013** AERA Division C Doctoral Student Seminar
- 2012** APA Division 15 Doctoral Student Seminar
- 2011** UC Educational Evaluation Center Fellow
- 2011** AERA Motivation Special Interest Group travel award
- 2011** AERA Division E Graduate Student Seminar
- 2009** University of California, Irvine Graduate Dean Recruitment Fellowship

## UNIVERSITY TEACHING EXPERIENCE

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**Lab Instructor**, EDUC 265, Applied Regression Analysis for Education & Social Research (PhD Course) School of Education, University of California, Irvine. 2012 and 2013.

Taught STATA lab using OLS, logistic regressions, and econometric methods. Professor: Greg Duncan

**Teaching Assistant**, EDUC 50, Issues in K-12 Education (undergraduate course), School of Education, University of California, Irvine. 2010 and 2011.

Designed and gave lectures, provided writing support, graded papers. Lecturer: Tim Tift

**Instructor**, Research and Writing Workshop, in association with Boston University School of Law, Boston MA. 2002

Designed and taught 10 week writing workshop to international graduate students.

**Teaching Assistant**, Writing Workshop, Boston University School of Law, Boston, MA. 2001.

Provided writing support for students in semester-long graduate writing course.

### Selected Guest Lectures

"Intelligence and Motivation," Guest lecture in course EDUC 238 (PhD level), Seminar in Cognition and Motivation, University of California, Irvine.

"Law and Education," Guest lecture in course EDUC 125, Child School Cinema and EDUC 50, Issues in K-12 Education, University of California, Irvine. Given three times.

“Spatial Ability and Math,” Guest lecture in course EDUC 616 (Teaching credential program), Foundations of Spatial Literacy, University of Redlands, Redlands, CA. Delivered online.

“Theories of Knowledge,” Guest lecture in course EDUC 173 (Teaching credential program), Cognition & Learning in Educational Settings, University of California, Irvine.

“Motivation: Achievement Goals, Expectancy-Value, and Mindsets,” Guest lecture in course EDUC 173, Cognition & Learning in Educational Settings, University of California, Irvine.

"Working Memory and Math Learning" Guest lecture in course EDUC 55, Knowing & Learning in Math & Science, University of California, Irvine.

## **K-12 TEACHING EXPERIENCE**

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**Teacher**, Pull-Out Class, Corporate Academy North, Miami, FL. 2000  
Mathematics and English instruction to prepare high school students for high school competency test.

**Teacher**, Computers and Art, Academy of Austin Charter School, Austin, TX. 1999  
Designed and taught computer and art classes to elementary students in new charter school.

**Substitute Teacher**, Dade County Public Schools, Miami, FL. 1998  
Short and long-term substitute teaching in high school.

**Student Teacher**, Fifth Grade Alternative Education, Snapper Creek Elem., Miami, FL. 1997

**Swimming Instructor**, Neva King Cooper Special Education Center for profoundly intellectually disabled, Dade County Public Schools, Homestead, FL. 1995-1996.

## **PROFESSIONAL EXPERIENCE**

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**Education Researcher**, MIND Research Institute, 2013-  
Design, development, and study of digital games to support learning of mathematics.

**Statistical Analysis & Survey Consultant**, University of California, Irvine, Medical School, 2012-13  
Analyze and report on results from pre and post surveys on an experimental medical education program.

**Assessment Consultant**, American Bar Association, Council on Legal Education Opportunity, 2011-12  
Designed and administered assessments to evaluate program based on motivation and self-regulated learning constructs. Assisted with creation of follow-up intervention.

**Educational Consultant**, Seven Hills Charter School, Worcester, MA, 2006  
Advised administrators and assisted in preparation for the school's state Coordinated Program Review on issues of special education, English language learners and civil rights.

**Public School Liaison/Education Specialist**, Massachusetts Dept. of Education, Malden, MA, 2004-06  
Led and participated on teams of staff from up to six DOE units in compliance monitoring through the Coordinated Program Review System. Interviewed administrators, teachers, specialists and staff and reviewed student records and other data to rate school district compliance on areas of regulation. Interpreted education regulations and analyzed school practices during monitoring and in responding to parent complaints and information requests regarding special education and civil rights.

**Judicial Law Clerk**, Massachusetts Appeals Court, Boston, MA. Judge Mark Green, 2003-04  
Advised Appellate judge on issues relevant to the current docket. Performed research and wrote memoranda of law and draft opinions.

## **NATIONAL AND INTERNATIONAL SERVICE**

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### **Ad Hoc Reviewer**

*Early Education and Development*, 2014  
*Sociological Perspectives*, 2014  
*American Educational Research Journal*, 2013  
*Journal of Advanced Academics*, 2013  
*Journal of Research on Educational Effectiveness*, 2013  
*Learning and Individual Differences*, 2012  
*American Journal of Evaluation*, 2012

### **Conference Proposal Reviewer**

Graduate student reviewer, American Educational Research Association Annual Meeting, Division C; Studying & Self-Regulated Learning Special Interest Group, 2013; 2014  
American Psychological Association Annual Meeting, *Division 15*, 2013

**Webmaster & Graduate Student Committee Chair**, American Educational Research Association, Studying & Self-Regulated Learning Special Interest Group, 2012-present

**Division C Graduate Student Campus Liaison**, American Educational Research Association, 2009-present

## **UNIVERSITY SERVICE**

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**Learning & Cognition Faculty Search Committee Student Representative**, University of California, Irvine, School of Education, 2012

**Math/Science Faculty Search Committee Student Representative**, University of California, Irvine, School of Education, 2012

**PhD Steering Committee Student Representative**, University of California, Irvine, School of Education, 2010-2012

**Socio-Emotional Development Lab Secretary**, University of California, Irvine, 2010-2011

## **COMMUNITY SERVICE**

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**Performer and Volunteer**, Musical Theatre Village, Community Theater, Irvine, CA. 2011-present

**School Site Council Member**, University Park Elementary, Irvine, CA. 2011-2013

**Founder and Director**, Portraits for Progress, Ltd. at <http://portraitsforprogress.org>, 2007-2009  
Ran an annual portrait charity event for breast cancer research. Raised and donated over \$1,000 each year.

**Volunteer Coach of the Boston University Synchronized Swimming Team**, Boston University, Boston, MA. 2001-2003

## **PROFESSIONAL AFFILIATIONS**

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UCI Center for Research on Cognition and Learning (CRCL)  
American Educational Research Association  
American Psychological Association: Division 15 & APAGS  
National Association for Gifted Children  
Society for Research in Child Development

## **RESEARCH AND STATISTICS SKILLS**

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Experimental design, large-scale education field research, field administration of cognitive & achievement tests, survey and assessment construction, analysis of large datasets

Training and experience with functional Magnetic Resonance Imaging (fMRI)

OLS and logistic regressions, Multilevel Modeling, Structural Equation Modeling, Propensity Score Matching, Econometric Techniques, Social Network Analysis

Software: SPSS, Stata, AMOS, E-Prime, Mplus, FileMaker Pro, Atlas.ti, Adobe Creative Suite, UCInet