# Katherine E. Lewis

## Associate Professor

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# **Education**

University of California, Berkeley – Ph.D. in Education	2011
Dissertation: Toward a Reconceptualization of Mathematical Learning Disabilities: A Focus on Difference Rather than Deficit	
Alan Schoenfeld (chair), Geoffrey Saxe, Susan Schweik	
University of California, Berkeley – M.A. in Education	2007
Trinity College Dublin, Ireland – M.Sc. in Multimedia Systems	2003
University of Notre Dame – B.A. in Psychology and Computer Applications  Magna Cum Laude.	1999

# **Professional Experience**

University of Washington – Associate Professor	2019-present
University of Washington – Assistant Professor	2013-2019
University of Minnesota – Post-doctoral Associate  Supervisor: Michèle Mazzocco	2012
Johns Hopkins University – Visiting Scholar / Post-doctoral Fellow Supervisor: Michèle Mazzocco	2011

# Honors, Awards, & Fellowships

Linking Research and Practice Outstanding Publication Award from the National Council of Teachers of Mathematics	2018
National Academy of Education - Spencer Postdoctoral Fellow	2015-2017
Early Career Publication Award from AERA Special Interest Group on Research in Mathematics Education	2015
Service Teaching and Research (STaR) Fellow	2014-2015
Technology Teaching Fellow – University of Washington	2013-2014
Spencer Dissertation Fellow	2010-2011
Research in Cognition and Mathematics Education (RCME) Fellow	2009-2011
Diversity in Mathematics Education (DiME) Research Fellow	2005-2009
Spencer Research Training Grant	2007-2008
University of California, Berkeley, Fellowship	2004-2005

# Publications – Journal Articles (\* peer reviewed)

<sup>\*</sup> Lewis, K. E., Sweeney, G., Thompson, G. M., Adler, R. M., and Alhamad, K. (2022). Dyscalculia in algebra: A case study. *Insights into Learning Disabilities* 19(1), 3-36.

- \* Lewis, K. E., Thompson, G. M. & Arvey, S. A. (2022). Screening for characteristics of dyscalculia: Identifying unconventional fraction understandings. *International Electronic Journal of Elementary Education* 14(3), 243-267. doi: 10.26822/iejee.2022.242
- \* Lewis, K. E., Sweeney, G., Thompson, G. M., & Adler, R. (2020). Integer number sense and notation: A case study of a student with a mathematics learning disability. *Journal of Mathematical Behavior*, 59, 1-27. doi: 10.1016/j.jmathb.2020.100797
- \* Lewis, K. E. & Lynn, D. M. (2018). Access through compensation: Emancipatory view of a mathematics learning disability. *Cognition & Instruction 36*(4), 424-459. doi: 10.1080/07370008.2018.1491581.
- \* Lewis, K. E. & Lynn, D. M. (2018). An insider's view of a mathematical learning disability: Compensating to gain access to fractions. *Investigations in Mathematics Learning* 10(3), 159-172. doi: 10.1080/19477503.2018.1444927.
- \* Lewis, K. E. & Lynn, D. M. (2018). Against the odds: Insights from a statistician with dyscalculia. Special Issue of *Education Sciences* on "Dispelling Myths about Mathematics" edited by Jo Boaler. *8*, 63. doi:10.3390/educsci8020063
- \* Lewis, K. E. & Fisher, M. B. (2018). Clinical interviews: Assessing and designing mathematics instruction for students with disabilities. *Intervention in School and Clinic.* 53(5). 283-291. doi: 10.1177/1053451217736864
- \* Lynch, S. R., Hunt, J. H., **Lewis, K. E.** (2018). Productive struggle for all: Differentiated instruction. *Mathematics Teaching in the Middle School.* 23(4),194-201.
- \* Lewis, K. E. (2017). Designing a bridging discourse: Re-mediation of a mathematical learning disability. *Journal of the Learning Sciences*, 26(2). 320-365. doi: 10.1080/10508406.2016.1256810
- \* Lewis, K. E. (2016). Beyond error patterns: A sociocultural view of fraction comparison error patterns in students with mathematical learning disabilities. *Learning Disability Quarterly* 39(4), 199-212. doi:10.1177/0731948716658063
- \* Lewis, K. E. (2016). Understanding mathematical learning disabilities as developmental difference: A fine-grained analysis of one student's partitioning strategies for fractions. *Infancia y Aprendizaje*, 39(4), 812-857. doi:10.1080/02103702.2016.1215085
- \* Lewis, K. E. & Fisher, M. B. (2016). Taking stock of 40 years of research on mathematical learning disability: Methodological issues and future directions. *Journal for Research in Mathematics Education*, 47(4), 338-371. doi:10.5951/jresematheduc.47.4.0338
- Schoenfeld, A. H. & Lewis, K. E., (2016). Becoming a researcher: A reflection. *Journal of Education*, 196(2), 63-69.
- \* Lewis, K. E. (2014). Difference not deficit: Reconceptualizing mathematical learning disabilities. Journal for Research in Mathematics Education, 45(3), pp. 351-396.
  - Reprinted (2016) in Journal of Education, 196(2), 39-62.
- \* Mazzocco, M.M.M., Myers, G.F., Lewis, K.E., Hanich, L.B., & Murphy, M.M. (2013). Limited knowledge of fraction representations differentiates middle school students with mathematics learning disability (dyscalculia) vs. low mathematics achievement. *Journal of Experimental Child Psychology*, 115, 371-387.

- **Lewis, K. E.** (2010). Understanding mathematical learning disabilities: A case study of errors and explanations. *Learning Disabilities a Contemporary Journal* 8(1), pp. 21-30.
- \* Saxe, G.B., Earnest, D., Sitabkhan, Y., Haldar, L.C., **Lewis, K.E.**, & Zheng, Y. (2010). Supporting generative thinking about integers on number lines in elementary mathematics. *Cognition and Instruction*, 28(4), pp. 433-474.

## **Publications – Book Chapters and Handbook Entries**

- Hunt, J. H. & Lewis, K. E. (2021). Extending students' knowledge of fractions as relational quantities: Teaching for understanding. In D. Bryant (Ed.) *Intensifying Mathematics Interventions for Students Who Struggle Learning Mathematics*.
- **Lewis, K. E.** (2018). Difference not deficit: Assessing issues of access in mathematics for students with disabilities. In S. Crespo, S. Celedón-Pattichis, and M. Civil (Eds). *Access and Equity: Promoting high quality mathematics in grades 3-5.* (pp. 35-48). Reston, VA: National Council for Teachers of Mathematics.
- **Lewis, K. E.** (2018). Vygotsky's zone of proximal development. In E. B. Braaten (Ed.) *The SAGE Encyclopedia of Intellectual and Developmental Disorders.* (pp. 1712-1714). Thousand Oaks, CA: SAGE Publication Inc. doi: 10.4135/9781483392271.n533

#### **Grants**

- Faculty Partner with Disability Rights Washington and Office of Education Ombuds. *One Out of Five* (OO5) Disability History and Pride Project. University of Washington, Unite:Ed Research + Practice Seed Grant. \$40,000
- Co-Principal Investigator. *Project FOSTER: Foundations Of Subject-matter in Teacher Education and Research.* U.S. Department of Education, Office of Special Education Services. Grant #H325D160044 (2016-2021). \$1,250,000. Roxanne Hudson, Pl.
- Principal Investigator. Rewriting Our Understanding of Mathematical Learning Disability. Harlan Hahn Endowment Fund, University of Washington (Travel award to fund participant/co-investigator's travel to national math education conference: PMENA) \$1868
- Principal Investigator. Beyond the Basics: Understanding Mathematical Learning Disabilities in Algebra.

  National Academy of Education, Spencer Postdoctoral Fellowship. (2015-2017) \$70,000
- Principal Investigator. *Into Uncharted Territories: Mathematical Learning Disabilities in Algebra*. Royalty Research Fund, University of Washington (2014-2015). \$28,973

# Conference Proceedings (\* peer reviewed)

- \* Lewis, K. E., Sweeney, G., Thompson, G. M., Adler, R. M., and Alhamad, K. (2022). Identifying Persistent Unconventional Understandings of Algebra: A Case Study of an Adult with Dyscalculia Proceedings of the 44<sup>th</sup> Annual Meeting of the North American Chapter of the International Group for Psychology and Mathematics Education (PME-NA). Nashville, TN. pp. 1645-1654.
- \* Lewis, K. E. & Lynn, D. M. (2016). Compensation: Rewriting our understanding of math learning disabilities. *Proceedings of the 38<sup>th</sup> Annual Meeting of the North American Chapter of the International Group for Psychology and Mathematics Education (PME-NA)*. Tucson, AZ. pp. 1064-1070.

- \* Lewis, K. E. (2015). Understanding issues of quantity through comparisons: Math learning disabilities and fractions. *Proceedings of the 37<sup>th</sup> Annual Meeting of the North American Chapter of the International Group for Psychology and Mathematics Education (PME-NA)*. East Lansing, MI. pp. 209-212.
- \* Lewis, K. E. (2012). Beyond low achievement: Identifying mathematical learning disabilities through atypical understandings. Proceedings of the 34<sup>th</sup> Annual Meeting of the North American Chapter of the International Group for Psychology and Mathematics Education (PME-NA). Kalamazoo, MI. pp. 1007.
- \* Lewis, K. E. (2010). Reconceptualizing mathematical learning disabilities: A diagnostic case study. Proceedings of the International Conference of the Learning Sciences (ICLS). June 29- July 2, 2010. pp. 742-749.
- \* Lewis, K. E. (2007). Mathematical learning disabilities: An exploratory case study. Proceedings of the North American Chapter of the International Group for Psychology and Mathematics Education (PME-NA). October 25-28, 2007. pp. 283-284.

#### **Invited Talks**

- **Lewis, K. E.** & Lynn, D. M. (2019, Nov). *Against the odds: Insights from a statistician with dyscalculia.* Invited talk at University of Washington's Advances in Higher Education Series. Seattle, WA.
- **Lewis, K. E.,** (2019, April) *Productive struggle for all students using differentiated instruction.* Invited talk at the National Council for Teachers of Mathematics Research Conference. San Diego, CA.
- Lambert, R., Harriss, E., Lynn, D. M. & **Lewis, K. E.** (2019, April). Rethinking mathematics education through neurodiversity. Invited talk at the National Council for Teachers of Mathematics Annual Conference. San Diego, CA.
- **Lewis, K. E.** (2017, April). *Mathematics learning disabilities in algebra: A case study.* Invited talk at the National Council for Teachers of Mathematics Research Conference, in the Mathematics Learning and Students with Disabilities Invited Session. San Antonio, TX.
- **Lewis, K. E.** (2016, December). *Mathematical learning disability through a Vygotskian lens: Difference, re-mediation, and compensation.* Invited Talk at University of Wisconsin, Madison. Mathematical Thinking, Learning, and Instruction Colloquium. Madison, WI.
- **Lewis, K. E.** (2016, August). *Providing access for all.* Invited keynote presentation at the Summer Academy on Mathematical Equity, Couer d'Alene, Idaho.
- **Lewis, K. E.** (2015, April) *Crafting a dissertation-based research article for Journal for Research in Mathematics Education*. Invited panel member at annual meeting for National Council for Teachers of Mathematics Annual Meeting. Boston, MA.
- **Lewis, K. E.,** Thouless, H., Fisher, M. (2013, April). *Identifying and building upon students'* mathematical understanding in RTI. Invited paper presented at National Council for Teachers of Mathematics Conference, Denver, CO.

# Conference Presentations (\* peer reviewed)

**Lewis, K. E.,** Sweeney, G., Thompson, G. M., Adler, R. M., and Alhamad, K. (2022, Nov). Identifying persistent unconventional understandings of algebra: A case study of an adult with dyscalculia.

- Paper presented at the annual meeting of the Psychology of Mathematics Education North America (PMENA) annual conference. Nashville. TN.
- \* Lambert, R., Hernandez-Saca, D.I. Mireles-Rios, R., **Lewis, K.E.** (2022, April 22-25). *Theorizing Complex Embodiment in Mathematics: Intersectionality, Emotion and Relationships in Mathematical Identity Development*. Paper presented at the annual meeting of the American Educational Researchers Association (AERA), San Diego, CA.
- \* Lambert, R., Hernandez-Saca, D.I. Mireles-Rios, R., **Lewis, K.E.** (2022, April 22-25). *Emotional Talk, Intersectional Positioning: Theorizing the Positionings of Multiply Marginalized Students as They Learn Mathematics.* Structured Poster presented at the annual meeting of the American Educational Researchers Association (AERA), San Diego, CA.
- Arvey, S. A., Matthews, C. Basas, C. G., **Lewis, K. E.,** Sarka, K., Rosenberg, A. (2021, April 17-20). *Celebrating Disability Identity and History Through Collaborative Curriculum and Research.* Panel presented at the annual conference for Society for Disability Studies, Online.
- \* Lewis, K. E., Sweeney, G., Adler, R. & Thompson, G. (2019, April). Atypical algebraic understandings: A case study of a mathematical learning disability. Paper presented at the annual meeting of the American Educational Research Association (AERA), Toronto, Canada.
- \* Lewis, K. E. & Lynn, D. (2018, April). Difference and compensation: Emancipatory research of mathematics learning disability. Paper presented at the annual meeting of the American Educational Researchers Association (AERA), New York, NY.
- \* Lewis, K. E. & Lynn, D. (2017, May). Emancipatory research: Compensating for a mathematical learning disability. Paper presented at the annual meeting of the American Educational Researchers Association (AERA), San Antonio, TX.
- **Lewis, K. E.** (2016, November). Beyond the basics: Understanding mathematical learning disabilities in algebra. Paper presented at the annual National Academy of Education Spencer Fellows Retreat, Washington DC.
- \* Lewis, K. E. & Lynn, D. (2016, November). Compensation: Rewriting our understanding of math learning disabilities. Paper presented at the annual meeting of the North American Chapter of the International Group for Psychology and Mathematics Education (PME-NA). Tucson, AZ.
- \* Fisher, M. B. & Lewis, K. E. (2016, April). *Increasing access: Mathematics instruction for students with disabilities*. Paper presented at the annual meeting of Council for Exceptional Children (CEC), St. Louis, MO.
- \* Lewis, K. E. & Fisher, M. B. (2016, April). Review of 40 years of research on mathematical learning disabilities: Methodological issues and future directions. Poster presented at the annual meeting of American Educational Researchers Association (AERA), Washington DC.
- \* Lewis, K. E. (2015, Nov). Understanding issues of quantity through comparisons: Math learning disabilities and fractions. Paper presented at the annual meeting of the North American Chapter of the International Group for Psychology and Mathematics Education (PME-NA). East Lansing, MI.
- **Lewis, K. E. &** Thompson, G. M. (2015, Oct). *Identifying difference: Screening for mathematical learning disabilities.* Poster presented at the annual meeting of Council for Learning Disabilities. Las Vegas, NV.

- \* Lewis, K. E. (2015, April). Reframing mathematical learning disabilities through a Vygotskian lens: A case study of a re-mediation. Paper presented at the annual meeting of American Educational Researchers Association (AERA), Chicago, IL.
- \* Lewis, K. E. (2014, April). Persistent difficulties with fractions: Understanding and screening for math learning disabilities. Paper presented at the annual meeting of Council for Exceptional Children (CEC), Philadelphia, PA.
- \* Lewis, K. E. (2014, April). *Math learning disabilities and fraction comparisons: Understanding errors.*Paper presented at the annual meeting of American Educational Researchers Association (AERA), Philadelphia, PA.
- \* Lewis, K. E. (2012, Nov). Beyond low achievement: Identifying mathematical learning disabilities through atypical understandings. Poster presented at the 34<sup>th</sup> Annual Meeting of the North American Chapter of the International Group for Psychology and Mathematics Education (PMENA). Kalamazoo, MI.
- \* Lewis, K. E. & Lynn, D. (2011, June). *Manifestations of a mathematical learning disability across topic domains: A unique case.* Paper presented at the 41<sup>st</sup> annual meeting of the Jean Piaget Society (JPS), Berkeley, CA.
- \* Lewis, K. E. (2011, April). Atypical understandings: Mathematical learning disabilities and fractions. Poster presented at the annual meeting of American Educational Researchers Association (AERA), New Orleans, LA.
- \* Lewis, K. E. (2011, April). Pairing diagnostic analysis and remediation: A case study of mathematical learning disabilities. Poster presented at the biennial Society for Research in Child Development (SRCD), Montreal, Canada.
- **Lewis, K. E.** (2010, June). *Mathematical learning disabilities and fractions: A diagnostic case study.*Poster presented at the annual meeting of the Institute of Education Sciences (IES), Washington, DC.
- \* Lewis, K. E. (2010, April). *Mathematical learning disabilities: Representing action, ignoring quantity.*Paper presented at the annual meeting of American Educational Researchers Association (AERA), Denver, CO.
- \* Lewis, K. E. (2009, October). Diagnosis and remediation: Mathematical learning disabilities and fractions. Paper presented at the annual conference of Learning Disabilities Worldwide (LDW), Burlington, MA.
- \* Lewis, K. E. (2009, April). Learning and forgetting: A microgenetic analysis of mathematical learning disabilities. Poster presented at the National Council for Teachers of Mathematics Research Presession, Washington DC.
- \* Lewis, K. E. (2009, April). Understanding difference: A view of mathematical learning disabilities through student explanations. Paper presented at the annual meeting of American Educational Researchers Association (AERA), San Diego, CA.
- \* Lewis, K. E. (2008, April). Into uncharted territories: mathematical learning disabilities in high school. Poster presented at the annual meeting of American Educational Researchers Association (AERA), New York, NY.
- \* Lewis, K. E. (2007, October). *Mathematical learning disabilities: An exploratory case study*. Poster presented at the annual meeting of the North American Chapter of the International Group for Psychology and Mathematics Education (PME-NA) Annual Meeting, Reno, NV.

\* Lewis, K. E. (2006, April) Learning as a process: A microgenetic analysis of one student's learning of integer arithmetic. Poster presented at the annual meeting of the American Educational Researchers Association (AERA), San Francisco, CA.

Diversity in Mathematics Education (DiME) Fellows. Why They Fail: Unpacking Everyday Explanations of the Achievement Gap Within Research on Differential Mathematics Achievement. American Educational Researchers Association Annual Meeting (AERA), Montreal, Canada.

## **Teaching**

Qualitative Methods in Educational Research I (EDPSY 586)

Disability and Ableism in Education (EDSPE 404)

Assessment for Inclusive Education (EDSPE 513)

Practicum in Research Design and Analysis in Special Education (EDSPE 517)

Special Education Doctoral Seminar – Literature Review (EDSPE 518)

Mathematics Methods for Students with Disabilities (EDSPE 523)

Technology & Educational Research, University of California, Berkeley

2014-2022
2014-2022
2013-2016, 2018-2022
2013-2015, 2017-2022
2008

# **Advising**

#### Current

- 4 Doctoral Students as Chair
- 1 Doctoral Committees as Member
- 10 Masters of Education Students (10 as chair)
- 3 Masters in Instructional Leadership as Member

#### Completed

- 3 Doctoral Student as Committee Member
- 25 Masters of Education Students (24 as chair)

#### Service

#### **National Service**

#### **Editorial Board**

American Educational Research Journal (AERJ) Intervention in School and Clinic

2016-2019 2015-2019

#### Reviewer

American Educational Research Association Annual Conference (AERA)

American Educational Research Journal

Cognition and Instruction

Computers and Education

Council for Exceptional Children Annual Conference (CEC)

**Educational Research and Reviews** 

**Education Sciences** 

**Educational Studies in Mathematics** 

International Conference of the Learning Sciences (ICLS)

International Electronic Journal of Elementary Education

Intervention in School and Clinic

Infancia y Aprendizaje

Journal of Learning Disabilities

Journal of Mathematical Behavior

Journal of Mathematics Teacher Education
Journal of Numerical Cognition
Journal for Research in Mathematics Education
Journal of Teacher Education
Learning and Individual Difference
Learning Disability a Contemporary Journal
Mathematical Thinking and Learning
National Science Foundation
Psychology of Mathematics Education – North America (PME-NA)
Research in Developmental Disabilities

Teachers College Record

<b>Invited Symposium Member</b> – Learning Differences and the Future of Special Education:	2019
Stanford University Graduate School of Education	
Presenter – Journal for Research in Mathematics Education Webinar: "From Dissertation	2019
to JRME Article" https://www.nctm.org/webinars/jrme/	
Board Member – Research in Mathematics Education Special Interest Group,	2017-2019
American Educational Research Association	
Co-Facilitator – Critical Perspectives on Disability Working Group at PME-NA	2016-2017
<b>Invited Panel Member – NCTM's Crafting a Dissertation-based Research Article for JRME</b>	2015
Co-Facilitator – Special Education Working Group at PME-NA	2012-2015
Organizer - Diversity in Mathematics Education (DiME) Retreat, UCLA	2007
Organizer - Diversity in Mathematics Education (DiME) Retreat, UC Berkeley	2006

# **University / College Service**

Member, Promotion and Tenure Committee – Maggie Beneke	2022
Vice Chair, Diversity and Equity Committee	2021-2022
Guest Speaker – EDLPS 526 Inquiry Series	2022
Reviewer – Royalty Research Fund	2021
Member, Promotion and Tenure Committee – Julia Duncheon	2021
Member – University of Washington Information Technology Accessibility Task Force	2020-2022
Reviewer – Royalty Research Fund	2020
College of Education Instructional Workgroup Member	2020
Mentoring Committee – Julia Duncheon	2020
Mentoring Committee – Emily Machado	2019
Guest Lecture – Leadership for Learning Instructional Leadership Strand	2019
Area Representative on Faculty Council	2017-2019
Reviewer – Royalty Research Fund	2018
UW Representative – Washington Transfer Institute	2017
Design Exceptional Children (EDSPE 304) for the online ECFS Program	2017
Guest Lecture – Seminal Readings in Math Ed	2017
Faculty Panel for Stanford Dean and Faculty Special Education Design Meeting	2017
Spencer Grant Panel Member	2017
Senior Lecturer Reappointment Committee Member	2017
Presenter – University of Washington Disability Studies Brown Bag	2016
Reviewer Royalty Research Fund	2016
Guest Lecture – Psychology of Math – EDPSY 581 (Sanders)	2016
Member – College of Education Technology Task Force	2015-2016
Organizer - New Faculty Induction	2015
Guest Lecturer – Implementation Research Group (Hudson/Davis)	2015
Coordinator – Junior Faculty Lunches for Special Education Faculty Search	2015
Member - Faculty Development and Support	2014-2015
Reviewer – Distinguished Doctoral Research Award	2014
College of Education Rep – Teaching & Learning Technologies Oversight Committee Mee	eting 2014

Member – Special Education Director Faculty Search	2014
Member – Technology Director Search Committee	2014
Organizer/Presenter – Canvas Workshops for College of Education	2014
Marshall – College of Education Graduation	2014, 2015
Guest Lecturer – Qualitative Methods	2014
Reviewer/Interviewer – Elementary Teacher Education Program	2013

#### State / Local Service

## Advisory Board Member for UW - Mathematics Pathways to Completion

2015-2018

The goal of this Dana Center New Mathways Project is to help students complete academic and professional programs by eliminating educational and systemic barriers to success in mathematics coursework, particularly for underserved students.

### Carnegie Alpha Lab Partnership with Seattle Community Colleges

2014-2015

Alpha labs are a researcher and practitioner partnership that involves a gradual scale-up of interventions.

#### **Professional Development**

- Summer Academy on Mathematical Equity: Providing Access for All", Coeur d'Alene Idaho	2016
~100 math teachers from Idaho	
- Hamlin Robinson School, Seattle, WA	2015
- Dartmoor School, Bellevue, WA	2014
- Martin Luther King Jr. Middle School, Berkeley, CA	2012

# **Memberships**

American Educational Research Association Association of Mathematics Teacher Educators Council for Exceptional Children National Council for Teachers of Mathematics

# **Other Work Experience**

# Senior Consultant – Cap Gemini Ernst & Young, Chicago, IL1999–2002• Developed eCommerce websites for clients in a variety of industries.2003–2004

Programmed web pages in C#, ASP, ASP.NET, JavaScript, and HTML.