February 20, 2024

Lauren A. Barth-Cohen, Ph.D.

Associate Professor of Science Education & Director, Learning & Cognition Program
Department of Educational Psychology
Adjunct Associate Professor, Department of Physics and Astronomy
University of Utah
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https://faculty.utah.edu/u6008162-Lauren_Barth-Cohen/research/index.hml
(she/her)

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EDUCATION

Ph.D. in Science and Mathematics Education, University of California, Berkeley, 2012
Committee: Andrea A. diSessa (Chair), Barbara Y. White, and Tania Lombrozo

B.A. in Physics, Smith College, 2005

PROFESSIONAL APPOINTMENTS

Director, Learning & Cognition Program, Department of Educational Psychology, University of Utah	2023-present
Associate Professor with tenure, Department of Educational Psychology, University of Utah	2023-present
Adjunct Associate Professor, Department of Physics & Astronomy, University of Utah	2023-present
Adjunct Assistant Professor, Department of Physics & Astronomy, University of Utah	2018-2023
Affiliated Faculty Member, Global Change and Sustainability Center (GCSC), University of Utah	2017-present
Assistant Professor, Department of Educational Psychology, University of Utah, 2016	2016-2023
Research Assistant Professor, Department of Teaching and Learning, University of Miami	2014-2016
Post- Doctoral Research and Teaching Associate, Maine Center for Research in STEM Education (The Maine RiSE Center), University of Maine	2013-2014

FUNDED GRANTS

External Funding

Developing and Implementing Case-Based Scenarios to Support Elementary Pre-service Teachers' Enactment of Equitable Mathematics and Science Instruction. National Science Foundation, DUE – IUSE (#2142136). Tracy E. Dobie (PI), Lauren Barth-Cohen (Co-PI), Connor K Warner (Co-PI), Lynne Zummo (Co-PI). $599,944 (1/2023-12/2025)

Collaborative Research: Learning to observe: Unpacking teachers development of expertise in scientific observation. National Science Foundation, EHR Core Research (#2201764) Lauren Barth-Cohen (PI), Lynne Zummo (Co-PI) & Holly Godsey (Co-PI). Sarah Braden (PI at USU). $599,224 (9/2022-8/2025)

The Utah Collaborative for Equitable STEM Teaching (UCET). National Science Foundation, Robert Noyce Teacher Scholarship Program (#2050579). Holly Godsey (PI), Mary Burbank (Co-PI),

Jordan Gerton (Co-PI), Anne Cook. (Co-PI), & Lauren Barth-Cohen (Co-PI). $1,447,781 (7/2021-6/2026)

Exploring Students' Learning of Data Analysis in a Three-Dimensional Lab Environment. National Science Foundation DUE-IUSE (#1938721). Lauren Barth-Cohen (PI), Claudia de Grandi (Co-PI), Jordan Gerton (Co-PI), and David Goldenberg (Co-PI). $299,191. (05/01/20-04/30/23)

The Utah Collaborative to Build Capacity for a Streamlined BS/MEd Program in Science Teacher Preparation. National Science Foundation, Robert Noyce Teacher Scholarship Program. **(**#1852932). Holly Godsey (PI), Lauren Barth-Cohen (Co-PI), Mary Burbank (Co-PI), Jordan Gerton (Co-PI), Andrea Rorrer (Co-PI) $125,000. (7/01/2019-6/30/2020).

Building Coherence in STEM Learning Opportunities for Pre-Service Elementary Teachers across Disciplinary Boundaries, National Science Foundation (DUE-IUSE, #1712493), Lauren Barth-Cohen (PI), Aaron J Bertram (Co-PI), Jordan M Gerton (Co-PI), José Gutierrez (Co-PI), $299,976. (08/17-07/21)

Transformative Robotics Experience for Elementary Students (TREES), National Science Foundation (DRL #1523010), Ji Shen (PI), Lauren Barth-Cohen (Co-PI), and Moataz Eltoukhy (Co-PI). $299,998 for 2 years (05/15-05/17)

University Grants

Developing and Enacting Case-Based Teaching Scenarios in Elementary STEM Education to Bridge the In-Service and Pre-service Teacher Divide. University of Utah, College of Education Research Incentive Seed Grant Program. Tracy Dobie (PI), Lauren Barth-Cohen (Co-PI). $12,000. (3/1/2020-2/28/2021)

Producing & Using Scientific Data about Climate Change, University of Miami, Lauren Barth-Cohen (PI) $44,126.76 (2014-2016)

HONORS, FELLOWSHIPS, AND AWARDS

University of Utah, Early Career Teaching Award, 2023

University of Utah, College of Education Early Career Faculty Research Award for Outstanding Contributions to Research and Scholarship, 2022

Physical Review Physics Education Research Article Processing Charge grant, $1000. 2021

Physics Education Research Leadership and Organizing Council (PERLOC) Conference Grant Award, American Association of Physics Teachers (AAPT), 2013

Spencer Dissertation Fellowship Finalist, National Academy of Education, 2012

Regents Fellowship, Graduate Fellowship, Dean's Normative Time Fellowship, University of California, Berkeley, 2006-2010

National Science Foundation Graduate Research Fellowship Program Honorable Mention, 2006

PUBLICATIONS

Journal Articles

Barth-Cohen, L., Dobie, T., Gutiérrez, J. F., *Francom, R., & *Greenberg, K., (2023). Pre-Service Elementary Teachers Knowledge Resources about Arguments and Representations in Math and Science. *Journal of Science Teacher Education.* https://doi.org/10.1080/1046560X.2023.2283662

Barth-Cohen, L., Swanson, H. & *Arnell, J., (2023). Methods of Research Design and Analysis for Identifying Resources*. Physical Review: Physics Education Research for the Focused Collection on Qualitative Methods in PER: A Critical Examination.* https://doi.org/10.1103/PhysRevPhysEducRes.19.020119

*May, J. M., **Barth-Cohen, L.,** Gerton, J., De Grandi, C., & *Adams, A. L. (2022) Student Sensemaking about Inconsistencies in a Reform-Based Introductory Physics Lab. *Physical Review—Physics Education Research,* 18(2).

*May, J, M., De Grandi, C., Gerton, J. M., **Barth-Cohen, L.,** *Montoya, B., & Beehler, A., (2022). Three-Dimensional Learning in a Reformed Introductory Physics Laboratory Course. *American Journal of Physics, 90, 452-461.*

Barth-Cohen, L., *Braden, S., *Young, T., *Gailey, S. (2021). Reasoning with evidence while modeling: Success at the middle school level. *Physical Review—Physics Education Research*, 17(2). DOI: 10.1103/PhysRevPhysEducRes.17.020106

Barth-Cohen, L. & *Braden, S. (2021). Unpacking the Complexity in Learning to Observe in Field Geology. *Cognition and Instruction, 40*(2), 233-265 https://doi.org/10.1080/07370008.2021.1934683

*Braden, S., **Barth-Cohen, L**., *Gailey, S., & *Young, T. (2021). Modeling magnetism with the floating paper clip: Cultivating and leveraging visual literacy and talk moves to support diverse learners. *Science Scope, 44(6), 84-92.*

Shen, J., *Chen, G., **Barth-Cohen, L.,** *Jiang, S., & Eltoukhy, M. (2020). Connecting Computational Thinking in Everyday Reasoning and Programming for Elementary School Students. *Journal of Research on Education in Technology.*

Barth-Cohen, L. A., *Montoya, B., & Shen, J. (2019). Walk like A Robot: A no-tech coding activity to teach computational thinking. *Science Scope, 42*(9), 12-16.

Barth-Cohen, L.A., *Jiang, S., Shen, J., *Chen, G., & Eltoukhy, M. (2018). Interpreting and Navigating Multiple Representations as Central to Computational Thinking in a Robotics Programming Environment. *Journal of STEM Education Research* (1-2). 119-147.

Barth-Cohen, L. A., *Greenberg, K. I., & Moretz, E. (September 2018). A Model for Earth's Energy Budget: Unpacking the relationship between energy and temperature to understand climate change. *The Science Teacher, 86*(2), 20-27.

Barth-Cohen, L. (2018). Threads of Local Continuity Between Centralized and Decentralized Causality: The Emergence of an Emergent Explanation. *Instructional Science 46*(5), 681–705.

Barth-Cohen, L. A., Little, A. J., & Abrahamson, D. (2018). Building Reflective Practices in a Pre-service Math and Science Teacher Education Course That Focuses on Qualitative Video Analysis. *Journal of Science Teacher Education*, *29*(2), 83-101.

Barth-Cohen, L., & *Medina, E. (2017). Using Models to Understand Sea Level Rise. *The Science Teacher*, *84*(7), 33.

*Chen, G., Shen, J., **Barth-Cohen, L.** *Jiang, S. Huang, X., and Eltoukhy, M. (2017). Assessing Elementary Students' Computational Thinking. *Computers & Education 109*, 162-175.

Barth-Cohen, L., & Wittmann, M. C. (2017). Aligning Coordination Class Theory with a New Context: Applying a Theory of Individual Learning to Group Learning. *Science Education. 101*(2) pp. 333-363.

Barth-Cohen, L. A., Smith, M. K., Capps, D. K., *Lewin, J. D., Shemwell, J. T., & Stetzer, M. R. (2016). What are middle school students talking about during clicker questions? Characterizing small-group conversations mediated by classroom response systems. *Journal of Science Education and Technology*, *25*(1), 50-61. (10.1007/s10956-015-9576-2).

Peer-Reviewed Book Chapters

Fick, S., Hmelo-Silver, C., **Barth-Cohen, L.,** Yoon, S. & Baek, J. (2021). Systems and System Models. In Nordine, J., & Okhee, L. (eds.) *Crosscutting Concepts: Strengthening Science and Engineering Learning*. NSTA Press.

Conference Proceedings (selected)

Barth-Cohen, L., May, J., *Young, T. & *Adams, A., (2023) Acquisition of qualitative video data:

methods and reflections in PER. Physics Education Research Conference Proceedings. Sacramento, CA.

*Young, T. G., **Barth-Cohen, L. A**. Braden, S. K., (2023). Students' use of symmetry as a tool for sensemaking. Physics Education Research Conference Proceedings. Sacramento, CA

Dobie, T., Zummo, L., *Dias, L., **Barth-Cohen, L**., & Warner, C. (2022, June). Case-based Scenarios for Supporting Equitable Mathematics and Science Instruction: Articulating Design Conjectures and Emerging Tensions. International Society of the Learning Sciences Annual Meeting, Hiroshima, Japan. [Virtual conference]

*May, J., **Barth-Cohen, L.,** *Adams, A., & *Griston, M. (2022, June). Unpacking Iteration: Exploring Forms of Iterative Practice in Physics Labs. International Society of the Learning Sciences Annual Meeting, Hiroshima, Japan. [Virtual conference]

*Young, T. G., **Barth-Cohen, L. A**. *Braden, S. K., & *Gailey, S. (2021). Middle grade students reasoning about temporary magnetism. *Physics Education Research Conference (PERC) Proceedings. pp.. XX-XX.* [Virtual conference]

*May, J., **Barth-Cohen, L**., & *Adams, A. (2021). Students' productive strategies when generating graphical representations: An undergraduate laboratory case study. *Physics Education Research Conference (PERC) Proceedings, pp.. XX-XX.* [Virtual conference]

*May, J. & **Barth-Cohen, L.** (2021). Students' Dynamic Framing of Epistemic Agency. In E. de Vries, J. Ahn, & Y. Hod (Eds.), Proceedings of International Conference of the Learning Sciences (ICLS) 2021. Bochum, Germany: International Society of the Learning Sciences. [Virtual conference]

Gutiérrez, J., *Shiver, S., Dobie, T., *Francom, R., **Barth-Cohen, L.** (2021) Anything But Race: Race-Evasion and Color-blindness in Preservice Teachers' Responses to a Hypothetical Scenario. In E. de Vries, J. Ahn, & Y. Hod (Eds.), Proceedings of International Conference of the Learning Sciences (ICLS) 2021. Bochum, Germany: International Society of the Learning Sciences. [Virtual conference]

Dobie, T.E., **Barth-Cohen, L.,** *Francom, R., *Greenberg, K., & Gutiérrez, J. (2020). Pre-service elementary teachers navigating tensions related to classroom social dynamics through hypothetical teaching scenarios. In A.I. Sacristán, J.C. Cortés-Zavala & P.M. Ruiz-Arias, (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. 1595-1600) Cinvestav / AMIUTEM / PME-NA. https:/doi.org/10.51272/pmena.42.2020

*Young, T., **Barth-Cohen, L**., *Braden, S., *Gailey, S. (2020). A case of successful learning about magnetism through the use of evidence. *2020 Physics Education Research Conference Proceedings* [Virtual Conference, July 22-23, 2020], edited by S. Wolf, M. B. Bennett, and B. W. Frank, doi:10.1119/perc.2020.pr.Young.

*May, J. M., **Barth-Cohen, L**. Gerton. J. M., & De Grandi, C. (2020). Students' dynamic engagement with experimental data in a physics laboratory setting. Physics Education Research Conference Proceedings [Virtual Conference, July 22-23, 2020], edited by S. Wolf, M. B. Bennett, and B. W. Frank, doi:10.1119/perc.2020.pr.May.

Barth-Cohen, L. & Wittmann, M. (2020). Learning about Crosscutting Concepts as Concepts. *The Interdisciplinarity of the Learning Sciences, 14th International Conference of the Learning Sciences (ICLS)*. Volume 1, 557-560. Nashville, TN. (online).

Barth-Cohen, L., Dobie, T., Greenberg, K., Francom, R., & Gutiérrez, J. (2020). Examining Links between Arguments and Representations in Pre-Service Teachers Pedagogical Content Knowledge. *The Interdisciplinarity of the Learning Sciences, 14th International Conference of the Learning Sciences (ICLS)*. Volume 4, 2253-2256. Nashville, TN. (online).

Gutiérrez, J., Dobie, T., *Greenberg, K., *Francom, R., & **Barth-Cohen, L.,** (2020). Examining Preservice Teachers' Written Responses to a Hypothetical Classroom Scenarios. *The Interdisciplinarity of the Learning Sciences, 14th International Conference of the Learning Sciences (ICLS)*. Volume 4, 2325-2328. Nashville, TN. (online).

Gutiérrez, J.F., **Barth-Cohen, L.A**., *Francom, R., *Greenberg, K., *MacArthur, K., & Dobie, T. (2019).

An emerging methodology for the study of preservice teachers' learning about equity in STEM education. In S. Otten, Z. de Araujo, A. Candela, & C. Munter (Eds.), *"…against a new horizon." Proceedings of the 41st annual meeting of the North-American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA)*. St. Louis, MO: University of Missouri.

Fick, S. J., **Barth-Cohen, L.,** Rivet, A., Cooper, M., Buell, J., & Badrinarayan, A. (2019). Supporting Students' Learning of Science Content and Practices Through the Intentional Incorporation and Scaffolding of Crosscutting Concept. In Fick, S. J., Nordine, J., & McElhaney, K. W. (Eds.). (2019). Proceedings of the Summit for Examining the Potential for Crosscutting Concepts to Support Three-Dimensional Learning. Charlottesville, VA: University of Virginia. pp. 15-26. Retrieved from http://curry.virginia.edu/CCC-Summit.

Nordine, J., **Barth-Cohen, L**., Gane, B., McKenna, TJ., & Vo, T. (2019) Looking Forward: Setting an Agenda for Research into the Crosscutting Concepts. In Fick, S. J., Nordine, J., & McElhaney, K. W. (Eds.). (2019). Proceedings of the Summit for Examining the Potential for Crosscutting Concepts to Support Three-Dimensional Learning. Charlottesville, VA: University of Virginia. pp. 74-86. Retrieved from http://curry.virginia.edu/CCC-Summit.

Barth-Cohen, L. & *Braden, S. (2018). A continuum of knowledge structures in an observation-based field geology setting. In Kay, J. and Luckin, R. (Eds.). (2018). Rethinking Learning in the Digital Age: Making the Learning Sciences Count, 13th International Conference of the Learning Sciences (ICLS) 2018, Volume 3. London, UK: International Society of the Learning Sciences. pp. 1599-1600.

Atkins Elliot, L. & **Barth-Cohen, L.** (2018). Constructing Entities in Scientific Models. In Kay, J. and Luckin, R. (Eds.). (2018). Rethinking Learning in the Digital Age: Making the Learning Sciences Count, 13th International Conference of the Learning Sciences (ICLS) 2018, Volume 3. London, UK: International Society of the Learning Sciences. pp.1679-1680.

Barth-Cohen, L., & Wittmann, M. C. (2016, June). Expanding Coordination Class Theory to Capture Conceptual Learning in a Classroom Environment. In Looi, C. K., Polman, J. L., Cress, U., and Reimann, P. (Eds.). (2016). Transforming Learning, Empowering Learners: The International Conference of the Learning Sciences (ICLS) 2016, Volume 1. Singapore: International Society of the Learning Sciences. pp. 386-393

Shen, J., *Chen, G., **Barth-Cohen, L.** & Eltoukhy, M. (2016, June). Developing a Language-neutral Instrument to Assess Fifth Graders' Computational Thinking. In Looi, C. K., Polman, J. L., Cress, U., and Reimann, P. (Eds.). (2016). Transforming Learning, Empowering Learners: The International Conference of the Learning Sciences (ICLS) 2016, Volume 1. Singapore: International Society of the Learning Sciences. pp.1179-1180

Barth-Cohen, L., Capps, D. & Shemwell, J. (2014). Modeling the Construction of Evidence Through Prior Knowledge and Observations from the Real World. In Polman, J. L., Kyza, E. A., O'Neill, D. K., Tabak, I., Penuel, W. R., Jurow, A. S., O'Connor, K., Lee, T., and D'Amico, L. (Eds.). (2014). Learning and becoming in practice: The International Conference of the Learning Sciences (ICLS) 2014, Volume 1. Boulder, CO: International Society of the Learning Sciences.

Barth-Cohen, L., Shemwell, J. & Capps, D. (2014). Learners Intuitions about Geology. In Polman, J. L., Kyza, E. A., O'Neill, D. K., Tabak, I., Penuel, W. R., Jurow, A. S., O'Connor, K., Lee, T., and D'Amico, L. (Eds.). (2014). Learning and becoming in practice: The International Conference of the Learning Sciences (ICLS) 2014, Volume 3. Boulder, CO: International Society of the Learning Sciences.

Conference Talks and Posters (selected)

*May, J., **Barth-Cohen, L.,** *Young, T. & Adams, A., (2023). Multimodality and Video Research in PER: A Methodological Case Study in Intro Physics Labs. Poster presented at the Physics

Education Research Conference Proceedings. Sacramento, CA

Godsey, H., Rocks, A., Burbank, M., **Barth-Cohen, L.,** Zummo, L., Gupta, U., Gerton, J., Cook, A., & McMurray, R. (2023). Utah Collaborative for Equitable STEM Teaching (UCET): Innovative Approaches to Pre-Service Teacher Preparation and Support. Poster presented at the 2023 Noyce Summit, Washington DC.

Adams, A. A. & **Barth-Cohen, L.** (2023). Exploring Student Sensemaking when Engaging with Anomalous Data. Conference talk presented at the Society for the Advancement of Biology Education Research (SABER) 2023 National Meeting.

Zummo, L.**, Barth-Cohen, L.**, Godsey, H.**,** Burbank, M.**,** and Cook, A. (2023). Using social and environmental justice issues as anchoring phenomena in an innovative science teaching methods course. Association for Science Teacher Educators (ASTE) Annual Conference, Salt Lake City, UT. January 14, 2023.

*Dias, L., **Barth-Cohen,** Dobie, T., Zummo, L., & Warner, C. (2023, April). Pre-service Teacher Thinking About Equity-Oriented Teaching Practices in Math and Science Using Case Prompts. Paper presented at the 2023 American Educational Research Association (AERA) annual meeting. Chicago, IL.

Barth-Cohen, L., Zummo, L., Braden, S., *Adams, A. & Godsey, H. (2023, April). Sensemaking about Geologic Features that are Spatially Adjacent and Chronologically Distant. Paper presented at the 2023 American Educational Research Association (AERA) annual meeting. Chicago, IL.

*Searle, B., *Adams, A., **Barth-Cohen, L.,** *Cao, M., Gerton, J., De Grandi, C., & *May, J. (2022, July). Investigating Interactions Between Students and TAs/LAs in a Reform-Based Introductory Physics Laboratory. Contributed Poster Presentation at the 2022 Physics Education Research Conference. Grand Rapids, Michigan.

*Cao, M., **Barth-Cohen, L.,** Gerton, J., De Grandi, C., *Adams, A., *May, J. & *Searle, B. (2022, July). Student Interactions and Group Dynamics within Reformed Introductory Physics for Life Science Laboratory (IPLS) Courses. Contributed Poster Presentation at the 2022 Physics Education Research Conference. Grand Rapids, Michigan

*Griston, M., *May, J., & **Barth-Cohen, L.** (2022, July). Students' use of consistency checks while sensemaking in inquiry-based labs. Contributed Poster Presentation at the 2022 Physics Education Research Conference. Grand Rapids, Michigan

*Young, T., Barth-Cohen, L., & *Braden, S. K., (2022, July). Students' use of symmetry resources when sensemaking about magnetism. Contributed Poster Presentation at the 2022 Physics Education Research Conference. Grand Rapids, Michigan

*Adams, A. & **Barth-Cohen L.** (July, 2022). Exploring Student Sensemaking When Engaging in Data Cleaning/ Poster to be presented at the SABER (Society for the Advancement of Biology Education Research) 2022 Meeting, University of Minnesota in Minneapolis.

*Adams A. L., **Barth-Cohen, L. A.,** *May, J. M, Gerton, J., De Grandi, C. (2022). Exploring Students' Learning of Data Analysis in a Three-Dimensional Lab Environment. Poster presented at the 2022 IUSE Summit, Propelling Change: Moving from Strategy Toward Elective & Equitable Undergraduate STEM Education. Washington DC.

*Adams A. L., **Barth-Cohen, L. A.,** *May, J. M. (2022) Investigating Student Response to Anomalous Data When Analyzing and Interpreting Data [Poster]. National Association for Research in Science Teaching (NARST) 2022 Annual Conference, Vancouver, B. C. (Canada).

*Adams, A. L., **Barth-Cohen, L. A.,** *May, J. M. (2021). Investigating Student Decision-Making when Engaging in Data Cleaning [Conference Presentation]. American Association of Physics Teachers 2021 Summer Meeting. [Virtual Conference].

*Adams, A. L., **Barth-Cohen, L. A**. (2021). Investigating Students' Process of Data Cleaning [Poster]. Physics Education Research Conference 2021, Virtual.

*Adams, A. L., *May, J. M., **Barth-Cohen, L. A**., De Grandi, C. (2021) Developing an Assessment to Investigate Data Analysis in Introductory Physics. Poster at the 2021 Annual Meeting of the American Education Research Association (AERA). [Virtual Conference].

Barth-Cohen, L., Dobie, T., *Greenberg, K., *Francom, R., Gutiérrez, J, F., *Shiver, S. (2021). Examining Intuitive Knowledge Resources at the Intersection of Scientific Arguments and Representations. Paper at the 2021 Annual Meeting of the American Education Research Association (AERA). [Virtual Conference].

*Young, T. G., **Barth-Cohen L. A.,** *Braden, S. K., *Gailey, S. (2020). Creating Explanatory and Predictive Models of Magnetism in the Middle-Grades. Contributed presentation at the 2020 American Association of Physics Teachers (AAPT) Annual Conference. Grand Rapids, Michigan (online).

*Young, T. G., **Barth-Cohen L. A**., *Braden, S. K., *Gailey, S. (2020). "Thinking Like a Physicist" in the Middle-Grades: Promising Results from 7th-grade Students Studying Magnetism. Poster presented at the 2020 American Association of Physics Teachers (AAPT) Annual Conference. Grand Rapids, Michigan (online).

Gutiérrez, J, F., **Barth-Cohen, L. A.,** *Francom, R., *Greenberg K., *MacArthur, K., & Dobie, T. (2020). Examining Racial Awareness and Color-Blind Discourse in Preservice Teachers' Responses to a Hypothetical Classroom Scenario. Paper presented at the 2020 Annual Meeting of the American Education Research Association (AERA). (conference cancelled)

*Francom, R., *Greenberg, K., Gutierrez, J. F., **Barth-Cohen, L.,** *MacArthur, K., Dobie, T. (2020) Pre-service Elementary Teachers' Responses to a Classroom Scenario Involving Indigenous Ways of Knowing in Science. Paper presented at the 2020 Annual Meeting of the American Education Research Association (AERA). (conference cancelled)

*Greenberg, K., **Barth-Cohen, L.** et al., (2020) Insights from a Mixed-methods Approach for Measuring Elementary Preservice Teacher's Pedagogical Content Knowledge for Mathematics. Paper presented at the 2020 Annual Meeting of the American Education Research Association (AERA). (conference canceled)

Barth-Cohen, L., *Braden, S., & *Gailey, S. (2019). Modeling Magnetism: Tools to Support Revision of Scientific Models. Presentation at the National Science Teacher Association (NSTA) 2019 Regional Conference, Salt Lake City.

Barth-Cohen, L., Dobie, T., & van Opstall, K., (2019). Connecting Mathematical Arguments and Representations to Support Student Learning. Research presentation at the NCTM 2019 Regional Conference & Exposition in Salt Lake.

*May, J. & **Barth-Cohen, L.**, Gerton, J., De Grandi, C., Adams, A., & Montoya, B. (2019a). Exploring Students' Enactment of Data Analysis Practices in Interdisciplinary IPLS Laboratory Courses. Poster presented at the 2019 Physics Education Research Conference (PERC), Provo, Utah.

*May, J., Gerton, J., De Grandi, C., **Barth-Cohen, L.,** & *Montoya, B. (2019b). Student Surveys and Mindset Interventions: Analysis from Reformed IPLS Labs. Poster presented at the 2019 American Association of Physics Teachers (AAPT) Annual Conference, Provo, Utah.

*May, J., Gerton, J., De Grandi, C., **Barth-Cohen, L.,** & *Montoya, B. (2019c). Implementation and Adaption of Evidence-Based IPLS Laboratories. Poster presented at the 2019 American Association of Physics Teachers (AAPT) Annual Conference, Provo, Utah.

*Braden, S., & **Barth-Cohen, L.** (2019). Analyzing the role of evidence in the model revision process. Juried talk presented at the 2019 Physics Education Research Conference (PERC) as supported by the American Association of Physics Teachers (AAPT) National Meeting. Provo, Utah.

Barth-Cohen, L., & *Braden, S., (2019). Scientific Modeling Instruction about Magnetism: Scaffolding for Equity. American Association of Physics Teachers (AAPT) National Meeting, Summer 2019. Provo, Utah.

Barth-Cohen, L., & *Braden S., (2019). Examining the relationship between learners' observation and knowledge structures in field geology. Paper presented in the symposium "Students' thinking and reasoning in the field of geosciences" for EARLI (European Association for Research in Learning and Instruction) 2019, organized by Reinfried, S., with discussant, Kapon, S. Aachen, Germany.

Barth-Cohen, L., *Francom, R., *Greenberg, K., *MacArthur, K., Gutiérrez, J. (2019). Identifying Pre-Service Elementary Teachers Productive Knowledge Resources around Representations and

Arguments in Math and Science. Paper presented at the 2019 Annual Meeting of the American Education Research Association (AERA). Toronto, Canada

*Francom, R., **Barth-Cohen, L.,** & Gutiérrez, J. (2019) Undergraduates Transitioning from STEM Degrees to Elementary Education Degrees: Driving values and motivating factors. Paper presented at the 2019 Annual Meeting of the American Education Research Association (AERA). Toronto, Canada

Fick, S. J., **Barth-Cohen, L.,** Rivet, A., Cooper, M., Buell, J., & Badrinarayan, A. (2019, April) Supporting Students' Learning of Science Content and Practices Through the Intentional Incorporation and Scaffolding of Crosscutting Concepts. Poster presented in the interactive poster session, Clarifying the Role(s) of the Crosscutting Concepts in Science and Engineering Learning. Organized by Fick, S. J. et al., at the 2019 s, Baltimore, MD.

Barth-Cohen, L. & *Braden, S. (2018, October). Explorations in a continuum of observation-based knowledge in a field geology setting. Paper presented at the EARLI (European Association for Research in Learning and Instruction) SIG 20 & 26 meeting "Argumentation and Inquiry as Venues for Civic Education." Jerusalem, Israel

*Chen, G., Shen, J., *Jiang, S., **Barth-Cohen, L.,** & Eltoukhy, M. (2018, April). Linking Elementary Students' Problem-solving Process to Computational Thinking. Poster presented at the 2018 Annual Conference of American Educational Research Association (AERA), New York City, NY.

Barth-Cohen, L.A., *Jiang, S., Shen, J., *Chen, G., Eltoukhy, M. (2017) Elementary School Students' Computational Thinking Practices in a Robotics-Programming Environment. Paper presented at the 2017 American Education Research Association (AERA) Conference Annual Meeting, San Antonio, TX.

Barth-Cohen, L. Shemwell, J. & Capps, D., (2016, April). Evidence Construction: The Constructive Process of Collecting and Interpreting Scientific Evidence and Associated Learning Processes. Paper presented at the 2016 National Association for Research in Science Teaching (NARST) Annual Meeting, Baltimore, MD.

Barth-Cohen, L., Eltoukhy, M., & Shen, J. (2016, April). Students Meta-Representational Competence in a Humanoid Robotics Programming Environment. Paper presented at the 2016 Annual Meeting of the American Educational Research Association, Washington, D.C.

Barth-Cohen, L. Shemwell, J. & Capps, D., (2015a, August). The Process of Generating an Argument at a Mechanistic Knowledge Level. Talk presented at the 2nd International Argument-Based Inquiry Conference 2015, Spokane, WA.

Barth-Cohen, L. Shemwell, J. & Capps, D., (2015b, August). The Importance of Evidence Construction in Argumentation. Talk presented at the 2nd International Argument-Based Inquiry Conference 2015, Spokane, WA.

Barth-Cohen, L. & Wittmann, M.C. (2015, April). Mismatches between Represented Science Content and Unmet Expectations as a Mechanism of Model Revision. Paper presented at the National Association of Research in Science Teaching (NARST) 2015 Annual Conference, Chicago, IL.

INVITED TALKS

Barth-Cohen, L., (2021, March). Unpacking and Responding to Student's Knowledge in Science. Department of Physics, Smith College, Northampton MA. [Virtual presentation]

Barth-Cohen, L. (2018, June). Energy and Equilibrium: Learning Challenges and Success. Gordon Research Conference, Physics Research and Education. Novel Research in Energy Topics, and Transformative Methods for Teaching Undergraduate Students About Energy Concepts. Bryant University, Smithfield, RI.

Barth-Cohen, L. (2017, September). Expanding Coordination Class Theory to Capture Students' Conceptual Learning in a Classroom Environment. Physics Department Seminar, Weber State University, Ogden, UT.

Barth-Cohen, L. (2013, July). Methods for Identifying Students' Knowledge About Complex Systems. Invited speaker in, Methodologies for identifying and investigating cognitive 'resources' in physics thinking. American Association of Physics Teachers, Summer Meeting. Portland, OR.

CURRENT INSTITUTION, INVITED SEMINARS

Barth-Cohen, L. (2023, August). How Students Learn: Building on prior knowledge through collaboration. Annual Teaching Symposium, Center for Teaching Excellence.

Barth-Cohen, L. (2023, August). Introducing PER: Sensemaking in Introductory Physics for Life Science (IPLS) Majors lab. REU summer lecture series, Department of Physics & Astronomy.

Barth-Cohen, L. (2021, September). How People Learn Physics. Introduction to Educational Psychology. Department of Educational Psychology.

Barth-Cohen, L. (2019, January). Capturing Three-Dimensional Science Learning about Climate Change in Classrooms through Embodied Modeling. Global Change & Sustainability Center (GCSC) Seminar Series. Sustainability Office,

Barth-Cohen, L. (2017, September). Exploring Research Topics. Guest Presentation in Teacher Recruitment Scholar (TRS) Seminar (EDU 5950). UITE, College of Education,

Barth-Cohen, L. (2017, January). Possible models for a STEM Education Research Graduate Program. CSME Exchange brown-bag discussion. College of Science.

Barth-Cohen, L. (2016, October). Expanding Coordination Class Theory to Capture Students' Conceptual Learning in a Classroom Environment. Learning & Cognition Friday Seminar.

UNIVERSITY TEACHING EXPERIENCE

Qualitative Research Methods (EDPS 7420), University of Utah, Department of Educational Psychology. Spring 2020, Spring 2022, & Spring 2024. Doctoral seminar for students in the Learning & Cognition program.

Elementary Science Methods (EDU 5375/6375), University of Utah, Urban Institute for Teacher Education (UITE). Spring 2017, Fall 2017, Spring 2018, Fall 2018, Spring 2019, Fall 2019, Spring 2020, Summer 2021, Fall 2021, Spring 2022, Summer 2022, Fall 2022, Summer 2023, Fall 2023, & Spring 2024. Required course for preservice teachers in the Elementary Education program.

Foundations of Learning (EDPS 6451/7451), University of Utah, Department of Educational Psychology. Fall 2016, Fall 2017, Fall 2018, Fall 2019, Fall 2020, Fall 2021, Fall 2022. Required course for master's students in the Instructional Design and Educational Technology (IDET) Program and for doctoral students in the Learning & Cognition program.

Learning Science Seminar (EDPS 7440), University of Utah, Department of Educational Psychology. Fall 2017, Spring 2018, Fall 2018, Spring 2019
Required course for doctoral students in the Learning & Cognition program.

Video Analysis Methods (TAL 711), University of Miami, Department of Teaching and Learning. Spring 2016. Elective seminar for doctoral students.

Knowing and Learning in Mathematics and Science, University of California, Berkeley, co-sponsored by Education Department and Cal Teach, Fall 2012.

ADVISING

Post-Doctoral

Mentor, Sarah Braden, Post-doctoral scholar in the College of Education, University of Utah. 2017

Ph.D. Students

Ph.D. Advisor to Marc Whiting, Learning & Cognition, University of Utah. 2023-present
Ph.D. Advisor to Adrian Adams, Learning & Cognition, University of Utah. 2020-present
Ph.D. Advisor to Rachel Francom, Learning & Cognition, University of Utah. 2017-2022
Dissertation title:
Co-Advisor to Jason May, Ph.D. candidate in the Department of Physics & Astronomy (Physics Education), University of Utah. *Dissertation title:* 2017-2022
Dissertation Committee Member and Research Advisor, Kelly MacArthur, Ph.D. candidate in the Department of Mathematics (Math Education), University of Utah. 2017-2020
Dissertation Committee Member and Research Advisor, Tamara Young, Ph.D. candidate in the Department of Physics & Astronomy (Physics Education), University of Utah. 2019-present
Dissertation Committee Member, K. Mae Larsson, Counseling Psychology, University of Utah. 2023-present
Dissertation Committee Member, Sara Gailey, Teacher Education & Leadership, Utah State University, 2023
Dissertation Committee Member, Ana Katz, Reading & Literacy, University of Utah. 2023-present
Dissertation Committee Member, Mike Froehly, Department of Parks & Recreation, University of Utah. 2022-present
Dissertation Committee Member, Doug Benton, School of Music, University of Utah. 2022-present
Dissertation Committee Member, Kevin Greenberg, Learning & Cognition, University of Utah. 2017-2021
Dissertation Committee Member, Matt Orr, Learning & Cognition, University of Utah. 2019-2022

M.S. & M.Ed Students

Thesis Committee Member, Kristina Carlson, Professional Masters' of Science and Technology program, University of Utah. 2018
Thesis Committee Member, Toni Zhang, Department of Physics and Astronomy (Physics Education), University of Utah. 2017-2018

Undergraduate Students

Research Mentor, Abigail McWhirter, Summer Program for Undergraduate Research, University of Utah 2023
Research Mentor, Jordan Giron, Summer Program for Undergraduate Research, University of Utah 2023
Research Mentor, William M. Grant, Research Experience for Undergraduates (REU), Department of Physics and Astronomy (Physics Education), University of Utah 2023
Research Mentor, Michelle Cao, Summer Program for Undergraduate Research, 2022

University of Utah

Research Mentor, Benjamin Searle, Research Experience for Undergraduates (REU). 2022
Department of Physics and Astronomy (Physics Education), University of Utah.

Research Mentor, Morgan Adams, Research Experience for Undergraduates (REU). 2021
Department of Physics and Astronomy (Physics Education), University of Utah.

Research Mentor, Molly Griston, Research Experience for Undergraduates (REU). 2021
Department of Physics and Astronomy (Physics Education), University of Utah.

Research Mentor, Liam Clancy, Research Experience for Undergraduates (REU). 2020
Department of Physics and Astronomy (Physics Education), University of Utah.

Research Mentor, Adrian Adams, Summer Program for Undergraduate Research, 2019
University of Utah.

Research Mentor, Brianna Montoya, Department of Physics & Astronomy (Physics Education), University of Utah. 2017-2018

Honors Thesis Advisor, Cristina Wilson, University of Miami. 2014-2016

Honors Thesis Advisor, Jean Stevens, University of Maine. 2013-2014

Research Mentor, Mark Kokish, University of California, Berkeley. 2013

Research Mentor, Samantha Dove, University of California, Berkeley. 2010

K-12 TEACHING

Instructor. Academic Talent Development Program (ATDP), University of California, Berkeley.

- Co-taught a project-based physics class for high school students on amusement park physics. Supported students in all phases of the project, from brainstorming through design and build to presenting how amusement park rides work. Summer 2011.
- Taught Wednesday Exploration alternative enrichment classes for high school students on patterns in physics and physics toys. Summer 2010, 2009, 2007.

WORKSHOPS AND OTHER SYNERGISTIC ACTIVITIES

Barth-Cohen, L. A. (2023, September). Guest Presentation on "*Methods of research design and analysis for identifying knowledge resources."* Learning Dynamics Seminar. Utah State University & Michigan State University.

Eltoukhy, M., *Chen, G. Shen, J. & **Barth-Cohen, L.** (2017). Transformative Robotic Experience for Elementary Students (TREES) Curriculum. 2nd Edition. A product of NSF 1523010 (Co-PI)

Wilson, C. M. & **Barth-Cohen, L.** (2016, April). Science Teachers' Means of Engaging with Scientific Practices in High-Quality Professional Development. 2016 Undergraduate Research, Creativity and Innovation Forum. Sponsored by the University of Miami Office of Undergraduate Research and Community Outreach.

Barth-Cohen, L. (2016, March). Incorporating Diversity in STEM Education. University of Miami, Miller School of Medicine Teaching and Learning Workshop for Biomedical Sciences Ph.D. Students. Miami, FL.

Barth-Cohen, L. & Brooks, D. (2015). Purpose and Utility of Learning Theory in PER: Report of the FFPER Theory Session. In. B. Lindsey, (Eds.). American Physical Society, Forum on Education, Fall 2015 Newsletter.

Barth-Cohen, L. (2015, November). Engaging Students with Science content through an embodied modeling activity. Annual RiSE Partnership Summit, "Evidence-Based Strategies for Excellence in Teaching: Active Learning and Student Engagement." Carabassett Valley, Maine.

Barth-Cohen, L. (2015, November). Energy Theater: An Instructional Strategy to Engage Students with Science Content through Movement and Discussion. Annual RiSE Partnership Summit,

"Evidence-Based Strategies for Excellence in Teaching: Active Learning and Student Engagement." Carabassett Valley, Maine.

Eltoukhy, M., **Barth-Cohen, L** & Shen, J. (2015). Transformative Robotic Experience for Elementary Students (TREES) Curriculum. 1st Edition. A product of NSF 1523010 (Co-PI).

Little, A. **Barth-Cohen L.** and Close, E. (2014, May). Video analysis with preservice teachers and LAs. Workshop presented at the 2014 PhysTEC conference, Austin, TX.

Barth-Cohen, L. (2014, March) Evidence Construction in a Field Geology Environment. Maine Center for Research in STEM Education (RiSE Center), University of Maine.

SERVICE, MEMBERSHIP, AND CONSULTING

Journal Reviewing

Frontiers in Education, 2022
International Journal of STEM Education, 2021, 2022
Revista Brasileira de Ensino de Física (Brazilian Journal of Physics Education), 2021
Computer Science Education, 2020
The Physics Teacher, 2020
Instructional Science, 2019, 2020, 2021, 2022, 2023
American Journal of Physics, 2019
Journal of Educational Psychology, 2018, 2019
The Journal of Mathematical Behavior, 2018
Journal of STEM Education Research, 2018
Physical Review—Physics Education Research, 2017, 2019, 2021, 2022, 2023, 2024
Journal of the Learning Sciences, 2016, 2022
Journal of Science Education and Technology, 2015, 2020
Cognition and Instruction, 2015, 2016, 2017, 2018, 2023
Science Education, 2013, 2014, 2020, 2021, 2022, 2023
Technology, Knowledge and Learning, 2013

Service to the University of Utah

Department of Educational Psychology

- Chair, Search Committee, Learning Sciences and Quantitative Methodology, 2023
- Committee member, STEM Education Faculty Search, 2021
- Committee member, STEM Learning in Museums and Informal Contexts Faculty Search, 2018, 2019
- Committee member, Math Education Faculty Search, 2017
- Committee member, Learning and Cognition, 2016-present
- Organizer, STEM Education Research Group, 2016-present

College of Education

- Chair, Curriculum Committee, 2023-present
- Committee Member, Elementary Education (Career-Line) Search Committee, 2023
- Committee Member, Curriculum Committee, 2022-present
- Committee Member, Dean's Search Committee, 2019-2020
- Committee Member, UITE Faculty, 2016-present
- Core Faculty Member and COE Liaison, new joint BS/MEd in secondary science teacher education

University Service

- Mentor, Vice-Present for Research, National Science Foundation Fellowship program, 2022
- Committee Member, Science and Mathematics Education Research Cluster Faculty Search, College of Science, Center for Science and Math Education (CSME), 2018-2019
- Committee Member, College of Science, Department-Driven Course and Curriculum Improvement program. 2016
- Committee Member, Advising the College of Science, Center for Science and Math Education (CSME), Master of Science for Secondary School Teachers (MSSST) program, 2016-2019
- Committee Member, Advising the College of Science, Center for Science and Math Education (CSME), Elementary STEM Endorsement (ESE), 2016-2019
- Committee Member, Department of Physics and Astronomy, Professor of Practice Faculty Search, 2017-2018
- Barth-Cohen, L. (2017, August). Learning from our students: Eliciting and using student thinking in mathematics classes. Math TA Training Workshop. Mathematics Department, University of Utah, Salt Lake City.
- Barth-Cohen, L. (2017, January). Physics Education Research (PER): An Emergent Research Area. Physics Undergraduate Seminar, Department of Physics and Astronomy. University of Utah, Salt Lake City, UT.
- Barth-Cohen, L. (2017, April). Electricity and Argumentation. Evening professional development workshop for elementary teachers enrolled in the Elementary STEM Endorsement. Center for Science and Mathematics Education (CSME), University of Utah.

Service to the University of Miami

- Committee Member, Secondary Education, Department of Teaching and Learning, 2014-2016
- Discussant. Panel, "Beyond Measure," Sponsored by the Future Educators Association Honor Society. 2016

External Grant Reviewing

National Science Foundation, 2017, 2019, 2020, 2022, 2023
Israel Science Foundation, 2018

Service to Professional Organization

Physics Education Research Leadership and Organizing Council (PERLOC), American Association of Physics Teachers (AAPT), 2021-present.
National Association for Research in Science Teaching (NARST), Program Committee, Co-Coordinator for Strand 1, Science Learning, Understanding, and Conceptual Change, 2014-2016.

Membership in Professional Organizations

American Association of Physics Teachers (AAPT), Member and Reviewer
American Educational Research Association (AERA), Member and Reviewer
European Association for Research on Learning and Instruction (EARLI)
International Society of the Learning Science (ISLS), Member and Reviewer
National Association for Research in Science Teaching (NARST), Member and Reviewer,
North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA 42). Mazatlán, Mexico, 2020. Reviewer

Public Service

Barth-Cohen, L. (2023, March). Panel speaker on "Women in STEM Inspiring the Future" Clark Planetarium, Salt Lake City UT.

*Braden, S., Barth-Cohen, L., *Gailey, S., *Young, T. (2019, September). Developing and Using Models with Magnetism. Professional Development workshop for middle school science teachers. Ogden School District. Mound Jr. High. Ogden UT.

Barth-Cohen, L. (2018, March). Teacher Twilight Series: Energy Theater: Improv Theater for Science Class. Weber State University, Ogden, UT.

Barth-Cohen, L. A. (2015, October). Energy Theater as an Interdisciplinary Science Learning Activity. Invited Presentation at Henry S. West Laboratory School, Coral Gables, FL.

Consulting

Utah RISE Science Data Review Meeting, September 2022

State Science Assessments, Performance Level Descriptors Workshop, American Institute for Research (AIR), May 2018

Middle School SEEd Cluster Standard Setting Workshop, Utah State Board of Education, July 2018, September 2019