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Education

2004 Ph.D. in Learning Sciences, Northwestern University, Evanston, IL

2000 MA in Cognitive Psychology, Tel Aviv University, Israel (Magna Cum Laude)

1992 Music Diploma (cello performance), Jerusalem Academy of Music, Israel.

Research Interest and Experience

Dor Abrahamson researches mathematics learning and teaching. He develops and evaluates theoretical models of these processes by analyzing empirical data collected during implementations of his innovative pedagogical design. Drawing on embodiment and sociocultural paradigms, Abrahamson is particularly interested in modeling how learners coordinate between informal and formal views on situated phenomena and what roles teachers play in ushering these coordinations. Abrahamson's analyses of pedagogical interactions focus on student and teacher use of inference, various modalities, media, discursive genres, semiotic systems, and metaphor.

At the core of Abrahamson's practice are cognitive domain re-analyses with an eye on creating learning materials and activities. Using both traditional media, such as concrete manipulatives, and recent technologies, such as motion sensors, touch screens, agent-based simulations, and artificial intelligence, Abrahamson has worked mostly on the concepts of proportion and probability. This line of research also informs the creation of design frameworks.

Abrahamson's pedagogical inventions have been incorporated into high-profile instructional units that are widely disseminated both through school-based curricular materials and via computer-based interactive software.

Earlier Research Experience at Northwestern: School of Education and Social Policy

On both research projects, below, Abrahamson initiated contacts with districts, principals, and teachers, designed learning materials and activities, led teacher workshops, classroom implementations, data analysis, and writing up for publications, reports, and presentations. Data treatment combined qualitative and quantitative methodologies.

2003-5 *The Center for Connected Learning and Computer-Based Modeling:*
Post-Doctoral Fellow leading the Northwestern work on NSF-funded project Integrated Simulation and Modeling Environments (ISME, Uri Wilensky, PI). On this project that investigated student cognition of complex systems, science, social sciences, and mathematics, Abrahamson interviewed individual students to probe for incipient understanding, then led cycles of design, programming, and facilitation of computer-authored learning environments for middle-school student focus groups and networked classrooms. Also, he recruited staff and led weekly project meetings.

2001-3 *Fuson Laboratory for the Development of Mathematics Curricula*:
NSF-funded doctoral dissertation project included the design and research of an innovative curricular unit for the mathematical domain of ratio and proportion (Prof. Karen C. Fuson, PI; Uri Wilensky, Co-Advisor). The design is now part of an acclaimed curriculum.

Courses Taught at Berkeley

- EDUC 203: Cultivating Cognitive Development: From Sensorimotor Intelligence to Embodied STEM Concepts
- EDUC 290C: Principles for Embodied Design: Exploring Learning-Sciences Perspectives on a Body-Based Approach to the Design of Learning Environments
- EDUC 222C: Design-Based Research in Mixed-Media Learning Environments
- EDUC 290C: Cognitive Ergonomics in STEM Education Research: A Multi-Disciplinary Analysis of Objects-to-Think-With
- EDUC 290C: Modeling-Based Methodology for Design, Learning, and Research
- EDUC 290C: Learning Chance: Computer-Supported Inquiry into Probability
- EDUC 224B: Paradigmatic Didactical–Mathematical Problematic Situations
- EDUC 223B: Research Group:
  - Embodied Design Research Laboratory
  - Embodied Underground
- EDUC 130: Knowing & Learning in Mathematics & Science (CalTeach course)

Publications

1. Refereed Journal Publications and Conference Proceedings

a. Refereed Journal Articles

Abrahamson, D., & Cigan, C. (2003). A design for ratio and proportion. *Mathematics Teaching in the Middle School, 8*(9), 493–501.

Abrahamson, D. (2006). The shape of things to come: The computational pictograph as a bridge from combinatorial space to outcome distribution. *International Journal of Computers for Mathematics Learning, 11*(1), 137–146.

Abrahamson, D., Berland, M. W., Shapiro, R. B., Unterman, J. W., & Wilensky, U. J. (2006). Leveraging epistemological diversity through computer-based argumentation in the domain of probability. *For the Learning of Mathematics, 26*(3), 39–45.

Abrahamson, D., Janusz, R., M., & Wilensky, U. (2006). There once was a 9-Block…—A middle-school design for probability and statistics. *Journal of Statistics Education, 14*(1). Retrieved August 12, 20010, at http://www.amstat.org/publications/jse/v14n1/abrahamson.html.

Abrahamson, D., & Wilensky, U. (2007). Learning axes and bridging tools in a technology-based design for statistics. *International Journal of Computers for Mathematics Learning, 12*(1), 23–55.

Abrahamson, D. (2009). Embodied design: Constructing means for constructing meaning. *Educational Studies in Mathematics, 70*(1), 27–47.

Abrahamson, D. (2009). Orchestrating semiotic leaps from tacit to cultural quantitative reasoning—the case of anticipating experimental outcomes of a quasi-binomial random generator. *Cognition and Instruction, 27*(3), 175–224.

Abrahamson, D. (2009). A student's synthesis of tacit and mathematical knowledge as a researcher's lens on bridging learning theory. In M. Borovcnik & R. Kapadia (Eds.), Research and developments in probability education [Special Issue]. *International Electronic Journal of Mathematics Education*, *4*(3), 195–226. Retrieved Aug. 12, 2010 from http://www.iejme.com/032009/main.htm

Veeragoudar Harrell, S., & Abrahamson, D. (2010). Second Life unplugged: A design for fostering at-risk students' STEM agency. In H. Gazit, D. L. Garcia, G. LeMasers, & L. Morgado (Eds.), The metaverse assembled [Special Issue]. *Journal of Virtual Worlds Research.* Retrieved Aug. 12, 2010, at https://journals.tdl.org/jvwr/article/view/834/716

Abrahamson, D., Trninic, D., Gutiérrez, J. F., Huth, J., & Lee, R. G. (2011). Hooks and shifts: A dialectical study of mediated discovery. *Technology, Knowledge, and Learning, 16*(1), 55–85.

Abrahamson, D., Gutiérrez, J. F., & Baddorf, A. K. (2012). Try to see it my way: The discursive function of idiosyncratic mathematical metaphor. *Mathematical Thinking and Learning, 14*(1), 55–80.

Abrahamson, D. (2012). Discovery reconceived: Product before process. *For the Learning of Mathematics, 32*(1), 8–15.

Abrahamson, D. (2012). Rethinking intensive quantities via guided mediated abduction. *The Journal of the Learning Sciences*. *21*(4), 626–649.

Abrahamson, D., Gutiérrez, J. F., Charoenying, T., Negrete, A. G., & Bumbacher, E. (2012). Fostering hooks and shifts: Tutorial tactics for guided mathematical discovery. *Technology, Knowledge, and Learning, 17*(1-2), 61–86.

Abrahamson, D. (2012). Seeing Chance: Perceptual reasoning as an epistemic resource for grounding compound event spaces. In R. Biehler & D. Pratt (Eds.), Probability in reasoning about data and risk [Special issue]. *ZDM—The International Journal on Mathematics Education, 44*(7), 869–881.

Abrahamson, D., Lee, R. G., Negrete, A. G., & Gutiérrez, J. F. (2014). Coordinating visualizations of polysemous action: Values added for grounding proportion. In F. Rivera, H. Steinbring, & A. Arcavi (Eds.), Visualization as an epistemological learning tool [Special issue]. *ZDM Mathematics Education, 46*(1), 79–93.

Abrahamson, D. (2014). Building educational activities for understanding: An elaboration on the embodied-design framework and its epistemic grounds. *International Journal of Child Computer Interaction, 2*(1), 1–16.

Abrahamson, D., & Trninic, D. (2015). Bringing forth mathematical concepts: Signifying sensorimotor enactment in fields of promoted action. In D. Reid, L. Brown, A. Coles, & M.-D. Lozano (Eds.), Enactivist methodology in mathematics education research [Special issue]. *ZDM Mathematics Education, 47*(2), 295–306.

Abrahamson, D., & Chase, K. (2015). Interfacing practices: Domain theory emerges via collaborative reflection. *Reflective Practice, 16*(3), 372–389.

Hutto, D. D., Kirchhoff, M. D., & Abrahamson, D. (2015). The enactive roots of STEM: Rethinking educational design in mathematics. In P. Chandler & A. Tricot (Eds.), Human movement, physical and mental health, and learning [Special issue]. *Educational Psychology Review, 27*(3), 371–389.

Abrahamson, D. (2015). Reinventing learning: A design-research odyssey. In S. Prediger, K. Gravemeijer, & J. Confrey (Eds.), Design research with a focus on learning processes [Special issue]. *ZDM Mathematics Education, 47*(6), 1013–1026.

Chase, K., & Abrahamson, D. (2015). Reverse-scaffolding algebra: Empirical evaluation of design architecture. In J. Smit, A. Bakker, & R. Wegerif (Eds.), Scaffolding and dialogic teaching in mathematics education [Special issue]. *ZDM Mathematics Education, 47*(7), 1195–1209.

Abrahamson, D., Shayan, S., Bakker, A., & Van der Schaaf, M. F. (2015). Eye-tracking Piaget: Capturing the emergence of attentional anchors in the coordination of proportional motor action. *Human Development*, *58*(4-5), 218–244.

Abrahamson, D., & Sánchez–García, R. (2016). Learning is moving in new ways: The ecological dynamics of mathematics education. *Journal of the Learning Sciences, 25*(2), 203–239.

Morgan, P., & Abrahamson, D. (2016). Cultivating the ineffable: The role of contemplative practice in enactivist learning. *For the Learning of Mathematics, 36*(3), 31–37.

Abrahamson, D., & Bakker, A. (2016). Making sense of movement in embodied design for mathematics learning. In N. Newcombe & S. Weisberg (Eds), Embodied cognition and STEM learning [Special issue]. *Cognitive Research: Principles and Implications (CRPI)*, *1*(1), Article #33.

Zohar, R., Bagno, E., Eylon, B., & Abrahamson, D. (2016). Creativity and cognition in embodied learning of physics concepts. *Dance Now, 32*, 24–31. (Original work published in Hebrew, in Israel)

Duijzer, A. C. G., Shayan, S., Van der Schaaf, M. F., Bakker, A., Abrahamson, D. (2017). Touchscreen tablets: Coordinating action and perception for mathematical cognition. *Frontiers in Psychology, 8*(144).

Abrahamson, D., & Kapur, M. (2018). Reinventing discovery learning: A field-wide research program. In D. Abrahamson & M. Kapur (Eds.), Practicing discovery-based learning: Evaluating new horizons [Special issue]. *Instructional Science, 46*(1), 1–10.

Chase, K., & Abrahamson, D. (2018). Searching for buried treasure: Uncovering discovery in discovery-based learning. In D. Abrahamson & M. Kapur (Eds.), Practicing discovery-based learning: Evaluating new horizons [Special issue]. *Instructional Science, 46*(1), 11–33.

Barth–Cohen, L. A., Little, A., & 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.

Zohar, R., Bagno, E., Eylon, B., & Abrahamson, D. (2018). Motor skills, creativity, and cognition in learning physics concepts. *Functional Neurology, Rehabilitation, and Ergonomics, 7*(3), 67–76.

Palatnik, A., & Abrahamson, D. (2018). Rhythmic movement as a tacit enactment goal mobilizes the emergence of mathematical structures. *Educational Studies in Mathematics, 99*(3), 293–309. https://doi.org/10.1007/s10649-018-9845-0

Green, C. A., Abrahamson, D., Chern, H., & O'Sullivan, P. S. (2018). Is robotic surgery highlighting critical gaps in resident training? *Journal of Graduate Medical Education, 10*(5), 491–493.

Abrahamson, D., Flood, V. J., Miele, J., & Siu, Y.-T. (2019). Enactivism and ethnomethodological conversation analysis as tools for expanding Universal Design for Learning: The case of visually impaired mathematics students. *ZDM Mathematics Education, 51*(2), 291–303. https://doi.org/10.1007/s11858-018-0998-1

Morgan, P., & Abrahamson, D. (2018). Applying contemplative practices to the educational design of mathematics content: Report from a pioneering workshop. *The Journal of Contemplative Inquiry, 5*(1), 107-119.

Abrahamson, D., & Shulman, A. (2019). Co-constructing movement in mathematics and dance: An interdisciplinary pedagogical dialogue on subjectivity and awareness. *Feldenkrais Research Journal*, *6,* 1–24.

Shvarts, A., & Abrahamson, D. (2019). Dual-eye-tracking Vygotsky: A microgenetic account of a teaching/learning collaboration in an embodied-interaction technological tutorial for mathematics. *Learning, Culture, and Social Interaction*, *22*, 100316. https://doi.org/10.1016/j.lcsi.2019.05.003

Abrahamson, D. (2020). Strawberry feel forever: Understanding metaphor as sensorimotor dynamics. *The Senses and Society*, *15*(2), 216–238. https://doi.org/10.1080/17458927.2020.1764742

Rosenbaum, L. F., Kaur, J., & Abrahamson, D. (2020). Shaping perception: Designing for participatory facilitation of collaborative geometry. In R. Nemirovsky & N. Sinclair (Eds.), On the intertwined contributions of physical and digital tools for the teaching and learning of mathematics [Special issue]. *Digital Experiences in Mathematics Education*. *6*(2), 213–232. https://doi.org/10.1007/s40751-020-00068-2

Abrahamson, D., & Abdu, R. (2020). Towards an ecological–dynamics design framework for embodied-interaction conceptual learning: The case of dynamic mathematics environments. In T. J. Kopcha, K. D. Valentine, & C. Ocak (Eds.), Embodied cognition and technology for learning [Special issue]. *Educational Technology Research and Development*. https://doi.org/10.1007/s11423-020-09805-1

Abrahamson, D., Nathan, M. J., Williams–Pierce, C., Walkington, C., Ottmar, E. R., Soto, H., & Alibali, M. W. (2020). The future of embodied design for mathematics teaching and learning. In S. Ramanathan (Ed.), Futures of STEM education: Multiple perspectives from researchers [Research topic]. *Frontiers in Education, 5*(147). https://doi.org/10.3389/feduc.2020.00147

Flood, V. J., Shvarts, A., & Abrahamson, D. (2020). Teaching with embodied learning technologies for mathematics: Responsive teaching for embodied learning. In A. Clark-Wilson, O. Robutti, & M. Thomas (Eds.), Teaching with digital technology [Special issue]. *ZDM Mathematics Education*, *52*(7), 1307-1331. https://doi.org/10.1007/s11858-020-01165-7

Abrahamson, D. (2021). Grasp actually: An evolutionist argument for enactivist mathematics education. *Human Development*, 1–17. https://doi.org/10.1159/000515680

Ba, H., & Abrahamson, D. (2021). Taking design to task: A dialogue on task initiation in STEM activities. *Educational Designer, 4*(14), 1–21. http://www.educationaldesigner.org/ed/volume4/issue14/article54/

Tancredi, S., Chen, R. S. Y., Krause, C., Abrahamson, D., & Gomez Paloma, F. (2021). Getting up to SpEED: Special Education Embodied Design for sensorially equitable inclusion. *Education Sciences and Society—Open Access, 12*(1), 113–136. https://doi.org/10.3280/ess1-2021oa11818

Abrahamson, D. (2021). Enactivist how? Rethinking metaphorizing as imaginary constraints projected on sensorimotor interaction dynamics. *Constructivist Foundations, 16*(3), 275–278. https://constructivist.info/16/3/275

Abrahamson, D., Worsley, M., Pardos, Z., & Ou, L. (2022). Learning analytics of embodied design: Enhancing synergy. *International Journal of Child-Computer Interaction*, *32,* 100409. https://doi.org/10.1016/j.ijcci.2021.100409

Pardos, Z., Rosenbaum, L., & Abrahamson, D. (2022). Characterizing learner behavior from touchscreen data. In D. Abrahamson, M. Worsley, Z. Pardos, & L. Ou (Eds.), Learning analytics of embodied design: Enhancing synergy [Special issue]. *International Journal of Child–Computer Interaction*, *32*, 100357. https://doi.org/10.1016/j.ijcci.2021.100357

Tancredi, S., Abdu, R., Abrahamson, D., & Balasubramaniam, R. (2022). Modeling nonlinear dynamics of fluency development in an embodied-design mathematics learning environment with Recurrence Quantification Analysis. In D. Abrahamson, M. Worsley, Z. Pardos, & L. Ou (Eds.), Learning analytics of embodied design: Enhancing synergy [Special issue]. *International Journal of Child–Computer Interaction, 32,* . https://doi.org/10.1016/j.ijcci.2021.100297 [Finalist, Best Paper, IJCCI 2021]

Lambert, S. G., Fiedler, B. L., Hershenow, C. S., Abrahamson, D., & Gorlewicz, J. L. (2022). A tangible manipulative for inclusive quadrilateral learning. *The Journal on Technology and Persons with Disabilities, 10,* 66–81. [Award: Best Submission—Dr. Arthur I. Karshmer Award for Assistive Technology Research]

Botetano, C., & Abrahamson, D. (2022). The Botetano arithmetic method: introduction and early evidence. *International Journal of Mathematical Education in Science and Technology, 53*(2), 516–534. https://doi.org/10.1080/0020739X.2020.1867916

Abrahamson, D., & Mechsner, F. (2022). Toward synergizing educational research and movement sciences: A dialogue on learning as developing perception for action. *Educational Psychology Review, 34*(3), 1813–1842. https://doi.org/10.1007/s10648-022-09668-3

Lambert, S. G., Tancredi, S., Fiedler, B. L., Moore, E. B., Gorlewicz, J. L., Abrahamson, D., & Gomez Paloma, F. (2022). Getting a grip on geometry: Developing a tangible manipulative for inclusive quadrilateral learning. *Italian Journal of Health Education, Sports and Inclusive Didactics, 6*(1), 1–21. https://doi.org/10.32043/gsd.v6i1.604

Benally, J., Palatnik, A., Ryokai, K., & Abrahamson, D. (in press). Learning through negotiating conceptually generative perspectival complementarities: The case of geometry. *For the Learning of Mathematics*.

DeLiema, D., Kwon, Y., Chisholm, A., Williams, I., Dahn, M., Flood, V. J., Abrahamson, D., & Steen, F. (in press). A multi-dimensional framework for documenting students' heterogeneous experiences with programming bugs. *Cognition & Instruction*.

Journal Articles Under Review / in Preparation

- Abdu, R., Tancredi, S., Abrahamson, D., & Balasubramaniam, R. (under review). A complex systems outlook on hand-eye coordination in mathematical learning. In M. Schindler, A. Shvarts, & A. Lilienthal. (Eds.), Eye-tracking research in mathematics education [Special issue]. *Educational Studies in Mathematics*.
- Flood, V. J., Palatnik, A. Chen, R. S. Y., & Abrahamson, D. (in preparation). *Dialogic emergence of rhythmic structures facilitates the co-construction of embodied mathematical meaning*.

b. Refereed Conference Proceedings

Abrahamson, D. (2002). When "the same" is the same as different differences: Aliya reconciles her perceptual judgment of proportional equivalence with her additive computation skills. In D. Mewborn, P. Sztajn, E. White, H. Wiegel, R. Bryant, and K. Nooney (Eds.), *Proceedings of the 24th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (Vol. 4, pp. 1658–1661). Columbus, OH: Eric Clearinghouse for Science, Mathematics, and Environmental Education.

Abrahamson, D. (2003). Text talk, body talk, table talk: A design of ratio and proportion as classroom parallel events. In N. A. Pateman, B. J. Dougherty, & J. Zilliox (Eds.), *Proceedings of the 27th Annual Meeting of the International Group for the Psychology of Mathematics Education* (Vol. 2, pp. 1–8). Columbus, OH: Eric Clearinghouse for Science, Mathematics, and Environmental Education.

Abrahamson, D., & Wilensky, U. (2003). The quest of the bell curve: A constructionist approach to learning statistics through designing computer-based probability experiments. In M. A. Mariotti (Ed.)*, Proceedings of the 3rd Conference of the European Society for Research in Mathematics Education*. Pisa, Italy: University of Pisa. Retrieved June 1, 2009, from http://www.dm.unipi.it/didattica/CERME3/proceedings/Groups/TG5/TG5_abrahamson_cerme3.pdf

Abrahamson, D. (2004). Embodied spatial articulation: A gesture perspective on student negotiation between kinesthetic schemas and epistemic forms in learning mathematics. In D. E. McDougall & J. A. Ross (Eds.), *Proceedings of the 26th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (Vol. 2, pp. 791–797). Windsor, Ontario: Preney.

Abrahamson, D., & Wilensky, U. (2004). S.A.M.P.L.E.R.: Collaborative interactive computer-based statistics learning environment. In M. Niss (Ed.), *Proceedings of the 10th International Congress on Mathematical Education*, Copenhagen, Denmark. Retrieved June 1, 2009, from http://www.icme-organisers.dk/tsg11/Papers/Abrahamson%20&%20Wilensky.doc

Abrahamson, D., & Wilensky, U. (2004). ProbLab: A computer-supported unit in probability and statistics. In M. J. Hoines & A. B. Fuglestad (Eds.), *Proceedings of the 28th Annual Meeting of the International Group for the Psychology of Mathematics Education* (Vol. 1, p. 369). Bergen University College.

Abrahamson, D., Berland, M.W., Shapiro, R. B., Unterman, J. W., & Wilensky, U. (2004). Leveraging epistemological diversity through computer-based argumentation in the domain of probability. In Y. B. Kafai, W. A. Sandoval, N. Enyedy, A. S. Nixon, F. Herrera (Eds.), *Proceedings of the 6th International Conference of the Learning Sciences* (pp. 28–35). Mahwah NJ: Lawrence Erlbaum Associates.

Abrahamson, D., & Wilensky, U. (2005). ProbLab goes to school: Design, teaching, and learning of probability with multi-agent interactive computer models. In M. Bosch (Ed.), *Proceedings of the 4th Congress of the European Society for Research in Mathematics Education* (pp. 570–579). Universitat Ramon Llull, Catalonia, Spain: FUNDEMI IQS.

Abrahamson, D., Blikstein, P., Lamberty, K. K., & Wilensky, U. (2005). Mixed-media learning environments. In M. Eisenberg & A. Eisenberg (Eds.), *Proceedings of the 4th International Conference for Interaction Design and Children (IDC 2005)*. Boulder, Colorado: IDC.

Abrahamson, D., & Wilensky, U. (2005). Understanding chance: From student voice to learning supports in a design experiment in the domain of probability. In G. M. Lloyd, M. Wilson, J. L. M. Wilkins, & S. L. Behm (Eds.), *Proceedings of the 27th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (Vol. 7, pp. 1–8). Roanoke, VA – Virginia Tech: PME-NA.

Abrahamson, D. (2006). Learning chance: Lessons from a learning-axis and bridging-tools perspective. In A. Rossman & B. Chance (Eds.), *Proceedings of the 7th International Conference on Teaching of Statistics*. Salvador, Brazil.

Abrahamson, D. (2006). "Because in the world, there are more blocks of this type": The real-worldness of immersive combinatorial analysis as a grounding of simulated probability experiments. In **D. Abrahamson (Organizer)**, What's a situation in situated cognition? – A constructionist critique of authentic inquiry. In S. Barab, K. Hay, & D. Hickey (Eds.), *Proceedings of the 7th International Conference of the Learning Sciences* (Vol. 2, pp. 1015–1021). Mahwah, NJ: Lawrence Erlbaum Associates.

Abrahamson, D., & Cendak, R. M. (2006). The odds of understanding the law of large numbers: A design for grounding intuitive probability in combinatorial analysis. In J. Novotná, H. Moraová, M. Krátká, N. Stehlíková (Eds.), *Proceedings of the 30th Conference of the International Group for the Psychology of Mathematics Education* (*Vol. 2,* pp. 1–8). Charles University, Prague, Czech Republic: PME.

Abrahamson, D. (2006). Mathematical representations as conceptual composites: Implications for design. In S. Alatorre, J. L, Cortina, M. Sáiz, & A. Méndez (Eds.), *Proceedings of the 28th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (Vol. 2, pp. 464–466). Universidad Pedagógica Nacional.

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Abrahamson, D., Blikstein, P., & Wilensky, U. (2007). Classroom model, model classroom: Computer-supported methodology for investigating collaborative-learning pedagogy. In C. Chinn, G. Erkens, & S. Puntambekar (Eds.), *Proceedings of the Biennial Conference on Computer Supported Collaborative Learning* (Vol. 8, Part 1, pp. 46–55). NJ: Rutgers University.

Abrahamson, D. (2007). Both rhyme and reason: Toward design that goes beyond what meets the eye. In T. Lamberg & L. Wiest (Eds.), *Proceedings of the 29th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 287–295). Stateline (Lake Tahoe), NV: University of Nevada, Reno.

Abrahamson, D. (2007). Handling problems: Embodied reasoning in situated mathematics. In T. Lamberg & L. Wiest (Eds.), *Proceedings of the 29thAnnual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 219–226). Stateline (Lake Tahoe), NV: University of Nevada, Reno.

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Veeragoudar Harrell, S., & Abrahamson, D. (2007). Computational literacy and mathematics learning in a virtual world: Identity, embodiment, and empowered media engagement. In C. Chinn, G. Erkens, & S. Puntambekar (Eds.), *Proceedings of the Computer Supported Collaborative Learning (CSCL) Conference* (Vol. 8, Part 1, pp. 264–265). NJ: Rutgers University. CD-ROM.

Abrahamson, D. (2007). The complexity of education research and why we like it. In M. Jacobson (Symposium Organizer & Chair) & W. Clancey (Discussant), Cognitive systems and the cognitive sciences: Potential for pervasive theoretical and research implications? In G. Trafton & D. S. McNamara (Eds.), *Proceedings of the 29th Meeting of the Cognitive Science Society* (pp. 29–30). Austin, TX: Cognitive Science Society. CD-ROM

Veeragoudar Harrell, S., & Abrahamson, D. (2008). It takes a virtual village: Transforming urban-youth intellectual agency through critical computational literacy. In S. Veeragoudar Harrell (Chair, Organizer) & S. Barab (Discussant), Virtually there: Emerging designs for STEM teaching and learning in immersive online 3D microworlds. Symposium in P. A. Kirschner, F. Prins, V. Jonker & G. Kanselaar (Eds*.), Proceedings of the 8th International Conference of the Learning Sciences—International Perspectives in the Learning Sciences: Cre8ing a Learning World (ICLS2008)* (Vol. 3, pp. 383–391). Utrecht, The Netherlands: ISLS.

Blikstein, P., Abrahamson, D., & Wilensky, U (2008). The classroom as a complex adaptive system: An agent-based framework to investigate students' emergent collective behaviors. In P. A. Kirschner, F. Prins, V. Jonker & G. Kanselaar (Eds*.), Proceedings of the 8th International Conference of the Learning Sciences—International Perspectives in the Learning Sciences: Cre8ing a Learning World (ICLS2008)* (Vol. 3, pp. 12–13). Utrecht, The Netherlands: ISLS.

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Abrahamson, D. (2019). A new world: Educational research on the sensorimotor roots of mathematical reasoning. In A. Shvarts (Ed.), *Proceedings of the annual meeting of the Russian chapter of the International Group for the Psychology of Mathematics Education (PME) & Yandex* (pp. 48–68). Moscow: Yandex.

Chen, R. S. Y., Ninh, A., Yu, B., & Abrahamson, D. (2020). Being in touch with the core of social interaction: Embodied design for the nonverbal. In M. Gresalfi & I. S. Horn (Eds.), *The Interdisciplinarity of the Learning Sciences, Proceedings of the 14th meeting of the International Society of the Learning Sciences (ICLS 2020)* (Vol. 3, pp. 1681–1684). International Society of the Learning Sciences.

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c. Conference Presentations (refereed acceptance; no proceedings)

Fuson, K. C., Kalchman, M., Abrahamson, D., & Izsák, A. (2002, April). *Bridging the addition–multiplication learning gap: Teaching studies in four multiplicative domains.* Symposium conducted at the annual meeting of the American Educational Research Association, New Orleans, LA.

Abrahamson, D. (2003, April). A situational–representational didactic design for fostering conceptual understanding of mathematical content: The case of ratio and proportion. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Abrahamson, D., & Wilensky, U. (2004, April). S.A.M.P.L.E.R.: Statistics As Multi-Participant Learning-Environment Resource. In U. Wilensky (Chair) & S. Papert (Discussant), *Networking and complexifying the science classroom: Students simulating and making sense of complex systems using the HubNet networked architecture*. Symposium conducted at the annual meeting of the American Educational Research Association, San Diego, CA.

Abrahamson, D., & Wilensky, U. (2005, April). Collaboration and equity in classroom activities using Statistics As Multi-Participant Learning-Environment Resource (S.A.M.P.L.E.R.). In W. Stroup & U. Wilensky (Chairs), C. D. Lee (Discussant), *Patterns in group learning with next-generation network technology*. Paper presented at the annual meeting of the American Educational Research Association, Montreal, Canada.

Abrahamson, D., & Wilensky, U. (2005, April). The stratified learning zone: Examining collaborative-learning design in demographically-diverse mathematics classrooms. In D. Y. White (Chair) & E. H. Gutstein (Discussant), *Equity and diversity studies in mathematics learning and instruction.* Paper presented at the annual meeting of the American Educational Research Association, Montreal, Canada.

Abrahamson, D., & Wilensky, U. (2005, June) Piaget? Vygotsky? I'm game: Agent-based modeling for psychology research. In M. Mascolo (Chair) *Theoretical issues,* the annual meeting of the Jean Piaget Society, Vancouver, Canada. http://ccl.northwestern.edu/research/conferences/JPS2005/jps2005.html

Abrahamson, D. (2006, April). Bottom-up stats: Toward an agent-based "unified" probability and statistics. In D. Abrahamson (Org.), U. Wilensky (Chair), and M. Eisenberg (Discussant), *Small steps for agents… giant steps for students?: Learning with agent-based models*. Symposium conducted at the annual meeting of the American Educational Research Association, San Francisco, CA.

Wilensky, U., & Abrahamson, D. (2006, April). *Is a disease like a lottery?: Classroom networked technology that enables student reasoning about complexity.* Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Abrahamson, D. (2006, April). Bottom-up stats: Toward an agent-based "unified" probability and statistics. In D. Abrahamson (Org.), U. Wilensky (Chair), and M. Eisenberg (Discussant), *Small steps for agents… giant steps for students?: Learning with agent-based models*. Symposium conducted at the annual meeting of the American Educational Research Association, San Francisco, CA.

Abrahamson, D. (2006, June). *The three M's: Imagination, embodiment, and mathematics*. Paper presented at the annual meeting of the Jean Piaget Society, Baltimore, MD, June 1–3.

Blikstein, P., Abrahamson, D., & Wilensky, U. (2006, June). *Minsky, mind, and models: Juxtaposing agent-based computer simulations and clinical-interview data as a methodology for investigating cognitive-developmental theory.* Paper presented at the annual meeting of the Jean Piaget Society, Baltimore, MD.

Abrahamson, D., Wilensky, U., & Levin, J. (2007, April). Agent-based modeling as a bridge between cognitive and social perspectives on learning. In **D. Abrahamson (Organizer),** U. Wilensky (Chair), & R. Lesh (Discussant), *Learning Complexity: Agent-based modeling supporting education research on student cognition in social contexts*. Paper accepted for presentation at the annual meeting of the American Educational Research Association, Chicago, IL, April 9–13.

Blikstein, P., Abrahamson, D., & Wilensky, U. (2007, April). Multi-agent simulation as a tool for investigating cognitive–developmental theory. In **D. Abrahamson (Organizer),** U. Wilensky (Chair), & R. Lesh (Discussant), *Learning Complexity: Agent-based modeling supporting education research on student cognition in social contexts.* Paper accepted for presentation at the annual meeting of the American Educational Research Association, Chicago, IL, April 9–13.

Abrahamson, D. (2007, April). *The real world as a trick question: Undergraduate statistics majors' construction-based modeling of probability*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL, April 9–13.

Abrahamson, D. (2007, June). *From gesture to design: Building cognitively ergonomic learning tools*. Paper presented at the annual conference of the International Society for Gesture Studies. Northwestern University, June 18–20.

Abrahamson, D. (2007, September). *From intuition to inscription: Emerging design principles for mathematics education*. Presented at the annual meeting of the International Society for Design and Development in Education (ISDDE), Berkeley, CA, September 17–20.

Abrahamson, D. (2008, April). Toward intuitive grasps of binomial distributions: A mixed-media approach. In A. Rubin (Chair) and P. Vahey (Discussant), *Contrasting perspectives on connecting important ideas in probability*. Symposium presented at the National Council of Teachers of Mathematics Research Presession, Salt Lake City, UT, April 7–9.

Abrahamson, D., Bryant, M. J., Howison, M. L., & Relaford-Doyle, J. J. (2008, March). *Toward a phenomenology of mathematical artifacts: A circumspective deconstruction of a design for the binomial.* Paper presented at the annual conference of the American Educational Research Association, New York, March 24 – 28.

Abrahamson, D. (2008, March). Fostering the emergence of an embodied cognitive artifact: The case of the number line in a design for probability. In **D. Abrahamson** (Chair), D. Earnest (Org.), & H. Bass (Discussant), *The many values of the number line—An interdisciplinary forum*. Symposium presented at the annual conference of the American Educational Research Association, New York, March 24–28.

Abrahamson, D. (2008, March). From gesture to design: Building cognitively ergonomic learning tools. In S. Gerofsky (Chair & Org.) & M. Nathan (Discussant), *Math education meets gesture studies: How mathematics education adapts gesture studies to its own purposes.* Symposium presented at the annual conference of the American Educational Research Association, New York, March 24–28.

Blikstein, P., Abrahamson, D., & Wilensky, U. (2008, March). *Groupwork as a complex adaptive system: A methodology to model, understand, and design classroom strategies for collaborative learning.* Paper presented at the annual conference of the American Educational Research Association, New York, March 24–\28.

Veeragoudar Harrell, S., & Abrahamson, D. (2008, March). *It takes a virtual village: Living and learning in online virtual reality*. In J. Mahiri (Chair & Org.) & C. D. Lee (Discussant), Reversing underachievement: Digital media in teaching and learning with highly marginalized students. Symposium presented at the annual conference of the American Educational Research Association, New York, March 24–28.

Blikstein, P., Wilensky, U., & Abrahamson, D. (2009, April). *Towards a framework for cognitive research using agent-based modeling and complexity sciences*. In M. Jacobson (Symposium Chair), M. Kapur (Organizer), & N. Sibelli (Discussant). Complexity, learning, and research: Under the microscope, new kinds of microscopes, and seeing differently**.** Paper presented at the annual meeting of the American Educational Research Association, San Diego, April 13–17.

Abrahamson, D. (2009, April). *Appropriate tools: On grounding mathematical procedures in perceptual intuitions.* Paper presented at the annual meeting of the American Educational Research Association, San Diego, April 13–17.

Mauks–Kaupke, K. P., Buchanan, K., Relaford–Doyle, J., Sushkova, D., & Abrahamson, D. (2009, April). *The double-edged sword of constructivist design*. Paper presented at the annual meeting of the American Educational Research Association, San Diego, April 13–17.

Zolkower, B., & Abrahamson, D. (2009, April). *Studying paradigmatic didactical-mathematical situations: Design and implementation of an experimental graduate level course for pre-service mathematics teachers and doctoral students.* Paper presented at the annual meeting of the American Educational Research Association, San Diego, April 13–17.

Veeragoudar, S., & Abrahamson, D. (2009, April). At-risk voices speak, theory is all ears: Toward an empirically-based model of agency for STEM learning. Paper presented at the annual meeting of the American Educational Research Association, San Diego, April 13–17.

Abrahamson, D., & Howison, M. L. (2010, May). Kinemathics: Exploring kinesthetically induced mathematical learning. Paper presented at the annual meeting of the American Educational Research Association, April 30 – May 4.

Abrahamson, D., & Howison, M. L. (2010, May). Embodied artifacts: coordinated action as an object-to-think-with. In D. L. Holton (Chair) & J. P. Gee (Discussant), *Embodied and enactive approaches to instruction: Implications and innovations*. Paper presented at the annual meeting of the American Educational Research Association, April 30 – May 4.

Gutiérrez, J. F., Trninic, D., Lee, R. G., & Abrahamson, D. (2011, April). *Hooks and shifts in instrumented mathematics learning.* Paper presented at the annual meeting of the American Educational Research Association (SIG Learning Sciences). New Orleans, LA, April 8–12, 2011.

Trninic, D., Gutiérrez, J. F., Lee, R. G., & Abrahamson, D. (2011, April). *Generative immersion and immersive generativity in instructional design*. Paper presented at the annual meeting of the American Educational Research Association (SIG Research in Mathematics Education). New Orleans, LA, April 8–12, 2011.

Abrahamson, D., Gutiérrez, J. F., Lee, R. G, Reinholz, D., & Trninic, D. (2011, April). *From tacit sensorimotor coupling to articulated mathematical reasoning in an embodied design for proportional reasoning.* In R. Goldman (Chair), H. Kwah & D. **Abrahamson** (Organizers), & R. P. Hall (Discussant), Diverse perspectives on embodied learning: Shat's so hard to grasp? Symposium presented at the annual meeting of the American Educational Research Association (SIG Advanced Technologies for Learning). New Orleans, LA, April 8–12, 2011.

Abrahamson, D., Trninic, D., & Gutiérrez, J. F. (2011, June). *Dialectical investigations of mathematical discovery: The emergence of disciplinary forms in an embodied-interaction design for proportions*. Paper presented at the annual meeting of the Jean Piaget Society, Berkeley, June 2–4.

Visintainer, T., Little, A., & Abrahamson, D. (2011, May). *Pedagogical heuristics for teacher preparation: Reflections from CalTeach*. Paper presented at the annual UTeach Institute/NIMSI conference, UT Austin, Austin, TX, May 24–26.

Charoenying, T., Trninic, D., & Abrahamson, D. (2012, April). *The choreography of conceptual development: Cognitive schemes meet cultural practice in instructional design*. Poster presented at the annual meeting of the American Educational Research Association, Vancouver, April 13–17.

Abrahamson, D., & Charoenying, T. (2012, April). *Doing-for-seeing, seeing-for-doing: Demonstration and imitation as critical opportunities for schema development in embodied-interaction mathematics learning.* Paper presented at the annual meeting of the American Educational Research Association, Vancouver, April 13–17.

Abrahamson, D., Negrete, A. G., & Gutiérrez, J. F. (2012, April). *Adding up to multiplicative concepts: The role of embodied reasoning.* Paper presented at the annual meeting of the American Educational Research Association (SIG Research in Mathematics Education), Vancouver, April 13–17.

Abrahamson, D., Gutiérrez, J. F., Charoenying, T., Negrete, A. G., & Bumbacher, E. (2012, April). Fostering mathematical discovery: One tutor's strategies for ushering the construction of proportional schemas via mediated embodied interaction. In J. Radinsky (Chair) & J. Lemke (Discussant), *Emergent methods for studying spatial and embodied dimensions of learning*. Symposium presented at the annual meeting of the American Educational Research Association (SIG Learning Sciences), Vancouver, April 13–17.

Abrahamson, D. (2012, May/June). *Discovery reconceived: Product before process*. Paper presented at "Rethinking Cognitive Development"—the 42nd annual meeting of the Jean Piaget Society, Toronto, May 31 – June 2.

Trninic, D., & Abrahamson, D. (2012, May/June). *Body of knowledge: Rethinking mathematical concepts as signified embodied procedures*. Paper presented at "Rethinking Cognitive Development"—the 42nd annual meeting of the Jean Piaget Society, Toronto, May 31 – June 2.

Lee, R. G., Hung, M., Negrete, A. G., & Abrahamson, D. (2013, April). *Rationale for a ratio-based conceptualization of slope: Results from a design-oriented embodied-cognition domain analysis.* Paper presented at the annual meeting of the American Educational Research Association (Special Interest Group on Research in Mathematics Education), San Francisco, April 27 - May 1.

Abrahamson, D., & Chase, K. (2015, April). *Leveling algebra transparency: Giant steps towards a new approach to learning?* Paper presented at the annual meeting of the American Educational Research Association, Chicago, April 16–20.

Flood, V. J., & Abrahamson, D. (2015, April). *Refining mathematical meanings through multimodal revoicing interactions: The case of "faster."* Paper presented at the annual meeting of the American Educational Research Association, Chicago, April 16 – 20.

Flood, V. J., Schneider, A., & Abrahamson, D. (2015, April). *Moving targets: Representing and simulating choreographies of multimodal pedagogical tactics for virtual agent mathematics tutors*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, April 16–20.

Abrahamson, D. (Co-Chair), Krajcik, J. S. (Discussant), Langbeheim, E., Levy, S. T. (Co-Chair), Peleg, R. (Organizer), & Zohar, A. (2015, April). *When chemistry education researchers met a new paradigm: a graduate seminar reflects on embodied cognition*. Symposium presented at the annual conference of the National Association for Research in Science Teaching (NARST), Chicago, April 11–14.

Abrahamson, D. (Chair), D. H. Clements (Discussant), & K. Chase (Organizer) (2016, April). *Discovery-based STEM learning 2.0: Are we there yet?* Symposium presented at the annual meeting of the American Educational Research Association (Special Interest Group: Learning Sciences), Washington, DC, April 8–12.

Trninic, D., & Abrahamson, D. (2016, April). *Making "direct instruction" and "discovery learning" play along: Restoring the historical educational role of practice*. Paper presented at the annual meeting of the American Educational Research Association, Washington, DC, April 8–12.

Chase, K., & Abrahamson, D. (2016, April). *Searching for buried treasure: Uncovering the discovery in discovery-based learning*. Paper presented at the annual meeting of the American Educational Research Association, Washington, DC, April 8–12.

Abrahamson, D., Shayan, S., Bakker, A., & Van der Schaaf, M. F. (2016, April). *Exposing Piaget's scheme: Empirical evidence for the microgenesis of coordination*. Poster presented at the annual meeting of the American Educational Research Association, Washington, DC, April 8–12.

Abrahamson, D., Sánchez-García, R., & Smyth, C. (2016, April). *Metaphors are projected constraints on action: An ecological dynamics view on learning across the disciplines*. Poster presented at the annual meeting of the American Educational Research Association, Washington, DC, April 8–12.

Abrahamson, D., Shayan, S., Bakker, A., & Van der Schaaf, M. (2016, June). *Evidence for reflective abstraction: Seeing (eye-tracking data) is believing*. Paper presented at the 46th annual meeting of the Jean Piaget Society, Chicago, June 9–11, 2016.

Zohar, R., Bagno, E., Eylon, B., & Abrahamson, D. (2016, July). *Dance, dance, revolution: From collective choreography to angular velocity via leveraging authentic discursive practices*. Paper presented at the annual meeting of JURE (Junior Researchers of EARLI), Helsinki.

Abrahamson, D., & Bakker, A. (2016, Sep.). *More than hand waving: Rethinking embodied movement in mathematics education.* Paper presented at the workshop "From basic cognition to the philosophy of mathematical practice," Institute of Mathematics, University of Seville, Seville, September 19–21.

Hutto, D. D., Abrahamson, D., & Kirchhoff, M. D. (2016, Sep.). *The enactive roots of STEM: Rethinking educational design in mathematics.* Paper presented at the workshop "From basic cognition to the philosophy of mathematical practice," Institute of Mathematics, University of Seville, Seville, September 19–21.

Rosen, D., Palatnik, A., & Abrahamson, D. (2017, April). *Constraints on embodiment: Iconicity may damage sensorimotor grounding*. In D. Uttal (Organizer & Chair) & N. Sinclair (Discussant), "On the interaction between embodied and symbolic mathematics knowledge: Implications for instruction"—symposium presented at the annual conference of the American Educational Research Association (AERA 2017), San Antonio, TX, April 27 – May 1.

Abrahamson, D., & Palatnik, A. (2017, June). *Taking measures to learn mathematics: Rhythmic enactment of coordinated movements as a performance goal driving conceptual development*. Paper presented at "Technologies and Human Development," the annual meeting of the Jean Piaget Society, San Francisco, June 8–10.

Morgan, P., & Abrahamson, D. (2017, June). *Cultivating the ineffable: Supporting the contemplative emergence of mathematics reasoning.* Paper presented at "Technologies and Human Development," the annual meeting of the Jean Piaget Society, San Francisco, June 8–10.

Zohar, R., Bagno, E., Eylon, B.-S., & Abrahamson, D. (2017, July). *Motor skills, creativity, and cognition in learning physics concepts.* Paper presented at the 1st annual meeting of *Movement: Brain, Body, Cognition*. Oxford, UK, July 9–11.

Abrahamson, D., & Shulman, A. (2017, July). *Constructing movement in mathematics and dance: An interdisciplinary pedagogical dialogue on subjectivity and awareness.* Paper presented at the 1st annual meeting of *Movement: Brain, Body, Cognition*. Oxford, UK, July 9–11.

Shayan, S., Bakker, A., van der Schaaf, M. F., & Abrahamson, D. (2017, Aug.). *Eye-tracking conceptual development: The case of tablet computers for mathematics learning*. Paper presented at the 18th European Conference on Developmental Psychology (ECDP2017), Utrecht, The Netherlands.

Shayan, S., Boven, L. M., Bakker, A., van der Schaaf, M. F., & Abrahamson (2017, Aug.). *Evidencing the emergence of sensorimotor structures underlying proportional reasoning*. Poster presented at the 19th European Conference on Eye Movements, Bergische Universität, Wuppertal, August 20–24, 2017.

Shvarts, A., & Abrahamson, D. (2018, April). *Towards a complex systems model of enculturation: A dual eye-tracking study*. Paper presented at the annual conference of the American Educational Research Association (Special Interest Group: Learning Sciences), NYC, April 13–17.

DeLiema, D., Abrahamson, D., Enyedy, N., Steen, F., Dahn, M., Flood, V. J., Taylor, J., & Lee, L. (2018, April). *Measuring debugging: How late elementary and middle school students handle broken code.* In Y. Kafai & D. A.-L. Lui (Chairs & Organizers), Measuring making: Methods, tools, and strategies for capturing learning, participation, and engagement in maker activities. Paper presented at the annual conference of the American Educational Research Association, New York City, April 13–17.

Rosenbaum, L. F., Bakker, A., & Abrahamson, D. (2018, April). *Enculturating movement: From sensorimotor schemes to mathematical structures*. Paper presented at the annual meeting of the American Psychological Association's conference on Technology, Mind & Society, Washington, DC, April 5–7, 2018.

Abrahamson, D. (Chair & Organizer). (2018, June). *A complex-dynamical-systems view on the situated emergence of coordinated activity: From single cells to human collectives*. Symposium presented at the annual meeting of the Jean Piaget Society, Amsterdam, May 31 – June 2.

Alberto, R. A., Shayan, S., van der Schaaf, M., Bakker, A., & Abrahamson, D. (2018, June). *How to design for embodied dynamic development toward proportional actions, perceptions and descriptions?* Paper presented at the annual meeting of the Jean Piaget Society, Amsterdam, May 31 – June 2.

Shvarts, A., & Abrahamson, D. (2018, June). *Vygotsky's psychological systems as complex dynamical systems: Theorizing multimodal data of student–tutor collaboration on an embodied mathematical task.* Paper presented at the annual meeting of the Jean Piaget Society, Amsterdam, May 31 – June 2.

Abrahamson, D. (2018, June). *Design research as iterated cycles of cognitive-task ideation, implementation, and analysis*. Paper presented at the annual meeting of the Jean Piaget Society, Amsterdam, May 31 – June 2.

Walker–van Aalst, O., DeLiema, D., Flood, V. J., & Abrahamson, D. (2018, June). *Peer conversations about refactoring computer code: Negotiating reflective abstraction through narrative, affect, and play*. Paper presented at the annual meeting of the Jean Piaget Society, Amsterdam, May 31 – June 2.

Bakker, A., Abrahamson, D., & Alberto, R. A. (2018, August). *The interplay of theory and methods in embodied design research.* In A. Bikner-Ahsbahs (Chair), R. Lehrer (Discussant), & A. Bakker (Organizer), How methodology and theory push each other forward [symposium]. Paper presented at "Dialogue between ontology and epistemology," the annual meeting of the European Association for Research on Learning and Instruction (EARLI) Special Interest Groups 17 & 25. Cambridge, UK, August 27–28.

Abdu, R., Abrahamson, D., Bakker, A., & Shayan, S. (2018, October). *Applying coordination dynamics to technologically-based embodied mathematics learning*. Paper presented at the annual meeting of the European Association for Research on Learning and Instruction (EARLI): Special Interest Group "Inquiry Learning" (20), Jerusalem, October 9–12.

Morgan, P., & Abrahamson, D. (2019, April). *Contemplative mathematics pedagogy: Report from a pioneering workshop*. Paper presented at the annual meeting of the American Educational Research Association (Special Interest Group: Holistic Education), Toronto, April 5–9.

DeLiema, D., Dahn, M. Enyedy, N., Abrahamson, D., Steen, F., Flood, V. J., & Taylor, J. (2019, April). Debugging failure: 5th-10th grade students' journal reflections, coding, and artwork about broken code. In D. A.-L. Lui, D. DeLiema, J. Ryoo, & Y. Kafai (Chairs & Organizers), *Failure in the learning process: How learners experience and overcome obstacles through resources and supports*. Structured poster session conducted at the annual meeting of the American Educational Research Association, Toronto, April 5–9.

Ryan, Z., DeLiema, D., & Abrahamson, D. (2019, April). Understanding instructors' reflections on conjecture maps and their impact on design-based research. In F. S. Azevedo (Session Organizer), *STEM Teacher Education and Cognition*. Roundtable session conducted at the annual meeting of the American Educational Research Association, Toronto, April 5–9.

Palatnik, A. & Abrahamson, D. (2020, February). *The functions of rhythmic movement in mathematical embodied activity*. Paper presented at the 8th Jerusalem Conference on Research in Mathematics Education—JCRME8 (in Hebrew).

Abrahamson, D., & Abdu, R. (2020, April). *Who constructs constraints? An ecological-dynamics comparison of two DME design rationales*. Paper presented at the annual meeting of the American Educational Research Association (SIG Learning Sciences), San Francisco, April 17–21.

Lambert, S. G., Fiedler, B. L., Hershenow, C. S., Abrahamson, D., & Gorlewicz, J. L. (2022, March). *A tangible manipulative for inclusive quadrilateral learning*. 37th annual CSUN Assistive Technology Conference, March 16.

d. Refereed Conference Workshops and Demos

Blikstein, P., Abrahamson, D., & Wilensky, U. (2005). NetLogo: Where we are, where we're going. In M. Eisenberg & A. Eisenberg (Eds.), *Proceedings of the 4th International Conference for Interaction Design and Children (IDC 2005)*, Boulder, Colorado.

Lindgren, R., Manches, A., & Abrahamson, D., Price, S., Lee, V. R., & Tissenbaum, M. (2016). Workshop: Embodiment and designing learning environments. In C.-K. Looi, J. L. Polman, U. Cress, & P. Reimann (Eds.), *"Transforming learning, empowering learners," Proceedings of the International Conference of the Learning Sciences (ICLS 2016)* (Vol. 2, pp. 1353–1355). Singapore: National Institute of Education.

Nathan, M. J., Ottmar, E. R., Abrahamson, D., Williams-Pierce, C., Walkington, C., & Nemirovsky, R. (2016). Embodied mathematical imagination and cognition (EMIC) workshop. In M. B. Wood, E. E. Turner, M. Civil, & J. A. Eli (Eds.), *Sin fronteras: Questioning borders with(in) mathematics education - Proceedings of the 38th annual meeting of the North-American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA)* (Ch. 13 [Working groups], pp. 1690–1697). Tucson, AZ: University of Arizona.

Worsley, M., Abrahamson, D., Bumbacher, E., Schneider, B., Grover, S., & Tissenbaum, M. (2016). Workshop: Situating multimodal learning analytics. In C.-K. Looi, J. L. Polman, U. Cress, & P. Reimann (Eds.), *"Transforming learning, empowering learners," Proceedings of the International Conference of the Learning Sciences (ICLS 2016)* (Vol. 2, pp. 1346–1349). Singapore: International Society of the Learning Sciences.

Abrahamson, D., & Rosenbaum, L. F. (2016, Nov.). *Embodied icosahedron*. Participatory activity designed for the Embodied Mathematics, Imagination, and Cognition Working Group (EMIC) at the 38th annual meeting of the North-American chapter of the International Group for the Psychology of Mathematics Education (PME-NA), Tucson, AZ, November 3–6.

Williams-Pierce, C., Walkington, C., Landy, D., Lindgren, R., Levy, S. T., Nathan, M. J., & Abrahamson, D. (2017). *Enabling and understanding embodied STEM learning*. Pre-conference workshop conducted at the biennial conference of Computer-Supported Collaborative Learning, Philadelphia.

Nathan, M. J., Williams-Pierce, C., Abrahamson, D., Ottmar, E. R., Landy, D., Smith, C., Walkington, C., DeLiema, D., Soto-Johnson, H., Alibali, M., & Boncoddo, R. (2017). Embodied Mathematical Imagination and Cognition (EMIC) Working Group. In E. Galindo & J. Newton (Eds.), *"Synergy at the crossroads" -- Proceedings of the 39th annual conference of the North-American chapter of the International Group for the Psychology of Mathematics Education* (Ch. 14 [Working groups], pp. 1497–1506). Indianapolis, IN: Hoosier Association of Mathematics Teacher Educators.

Abrahamson, D. (2017). *Methods: Design-based research*. Workshop facilitated at the "Cognitive Adventures" conference, Copernicus Science Centre, Warsaw, Poland, October 26–27.

Ottmar, E. R., Melcer, E., Abrahamson, D., Nathan, M. J., Fyfe, E., & Smith, C. (2018). Embodied Mathematical Imagination and Cognition (EMIC) Working Group. In T. H. Hodges, G. J. Roy, & A. M. Tyminski (Eds.), *"Looking back, looking ahead: Celebrating 40 years of PME-NA"—Proceedings of the 40th annual conference of the North-American chapter of the International Group for the Psychology of Mathematics Education*. Greenville, SC: University of South Carolina.

Ottmar, E., Harrison, A., Walkington, C., Abrahamson, D., Nathan, M. J., & Smith, C. (2019). Embodied Mathematical Imagination and Cognition (EMIC) Working Group. In S. Otten, Z. de Araujo, A. Candela, & C. Munter (Eds.), *"Against a new horizon"—Proceedings of the 41st annual conference of the North-American chapter of the International Group for the Psychology of Mathematics Education* (pp. 1913–1923). St. Louis, MO: University of Missouri.

Abrahamson, D. (2020, January). *The Mathematics Imagery Trainer: Project overview*. Workshop demonstration presented in E. Moore (Convener), NSF: AccelNet: Connecting Across Networks, Colorado University at Boulder, January 15–17, 2020.

Nathan, M. J., Harrison, A., Smith, H., Ottmar, E., Abrahamson, D., & Williams–Price (2021). Embodied Mathematical Imagination and Cognition (EMIC) Working Group. In A. Isabel Sacristán & J. Carlos Cortés (Eds.), *"Entre Culturas / Across Cultures"—Proceedings of the 42nd annual meeting of the North-American chapter of the International Group for the Psychology of Mathematics Education (PME-NA)* (pp. 166–168). PME-NA.

2. Non-Refereed Publications, Technical Reports, Workshops, Software, etc.

a. Non-Refereed Journal Article

Abrahamson, D. (2006). What do we think about when we calculate? *Einayim* (http://www.einayim.com/). [children's magazine published in Israel]

b. Non-Refereed Conference Proceedings

Abrahamson, D. (2008). Writes of passage: From phenomenology to semiosis in mathematical learning. In T. Rikakis & A. Kelliher (Eds.), Proceedings of CreativeIT: Success factors in fostering creativity in IT research and education. Tempe, AZ: Arizona State University. http://l3dswiki.cs.colorado.edu:3232/CreativeIT/247

Trninic, D., & Abrahamson, D. (2010). A key problem: Pedagogical tradeoffs along familiar and generic dimensions. In C. Reading (Ed.), *"Data and context in statistics education: Towards an evidence-based society." Proceedings of the 8th International Conference on Teaching Statistics (ICOTS8)*. Ljubljana, Slovenia, July, 2010. Voorburg, The Netherlands: International Statistical Institute. www.stat.auckland.ac.nz/~iase/publications.php

c. Non-Refereed Invited Presentations

Abrahamson, D. (2003, March). *The role of gesture in the teaching and learning of ratio and proportion*. Presentation at the weekly meeting of the laboratory of Susan Goldin-Meadow, Department of Psychology, University of Chicago, March 19, 2003.

Abrahamson, D. (2003, March). *Learning probability and statistics by building agent-based computer models*. Presentation and NetLogo workshop at the 3rd Conference of the European Society for Research in Mathematics Education, Bellaria, Italy, Feb. 28 – March 3.

Abrahamson, D. (2006, May). *Mathematical intuition – what is it good for? Reflections from design research on young student understanding of the binomial function.* In P. Blikstein & R. Lerner, Colloquium Series at the School of Education and Social Policy. Northwestern University, Evanston, IL.

Abrahamson, D. (2007, October). *From intuition to inscription: Designing learning experiences for deep mathematical understanding*. In N. L. Stein (Organizer), The Spencer Conference: Developmental and Learning Sciences Go to School: Implications for Education and Policy. Chicago, October 10–14.

Abrahamson, D. (2007, November). *Agents, agency, equity: A complexity-studies perspective on classroom participation patterns*. In K. W. Fischer (President) and M. Schwartz (Chair), The Inaugural Conference of the International Mind, Brain, and Education Society (IMBES): The Nature of Human Learning and How Educational Policy Can Profit from Research, Fort Worth, TX, November 1–3.

Abrahamson, D (2007, December). *Weaving epistemic & material resources: An embodied-mathematics design-research perspective on situated problem solving*. Paper presented at the Research on Embodied Mathematical Cognition, Technology, and Learning (REMCTL) Workshop. Stanford, Palo Alto: Center for Advanced Study in Behavioral Sciences (CASBS), Dec 10–11.

Abrahamson, D. (2008, December). *The abduction of Peirce: The missing link between perceptual judgment and mathematical reasoning?* Presentation at the Townsend Working Group in Neuroscience and Philosophy (A. Rokem, J. Stazicker, & A. Noë, Organizers), UC Berkeley. https://www.youtube.com/watch?v=GbslZe1XMkI

Abrahamson, D. (2009, January). *Close listening to gesture - an embodied-design perspective on mathematical reasoning*. Presentation at Leonardo Art/Science Evening Rendezvous (LASER; P. Scaruffi, Chair), San Francisco State University, San Francisco.

Abrahamson, D. (2009, February). *Promoting computational literacy: A view from mathematics-education research; or, What might it even mean to start with principles?!* Presentation at the National Academies—Computational Thinking for Everyone: A Workshop Series, Keck Center, Washington, DC, February 19–20, 2009.

Abrahamson, D. (2010, May). *Complex systems in the study of ecologies of learning.* Chair of the Presidential Address at the annual meeting of the American Educational Research Association, Denver, CO, April 30 – May 4.

Abrahamson, D. (2010, May). *Embodying proportion: More than hand waving?* Presentation at the Curriculum Studies and Teachers Education Departmental Colloquium Series (C. Goldenberg, Coordinator), Stanford, May 12.

Abrahamson, D. (2011, January). *Dialectical investigations of mathematical discovery: The emergence of disciplinary forms in an embodied-interaction design for proportions*. In Y. Kali (Organizer), Humans, Education, and Technology, a seminar series hosted by the Innovative Technologies in Education Program in the Department of Learning, Instruction, and Teacher Education at the University of Haifa, Israel, January 5, 2011. http://www.edtech.haifa.ac.il/Seminars/Archive/page

Abrahamson, D. (2011, May). *Build first, ask questions later*. Invited lecture in the course "Beyond Bits and Atoms" (P. Blikstein, Instructor). Learning, Design, and Technology program at the Graduate School of Education, Stanford, May 6, 2011.

Abrahamson, D. (2012, March). *Discovery reconceived: guided mediated mathematical insight*. Paper presented in M. S. Horn (Organizer), Colloquium Series of the Cognitive Sciences program, Northwestern University, March 27, 2012.

Abrahamson, D. (2012, April). *Discovery reconceived: guided mediated mathematical insight.* Paper presented in T. Griffiths (Organizer), Colloquium Series at the Institute for Cognitive and Brain Sciences, University of California, Berkeley, April 6, 2012.

Abrahamson, D. (2012, September). *Some affordances of embodied-interaction for mathematics learning*. Presentation at the annual meeting of the International Society for Design and Development in Education (ISDDE 2012): "Unpacking design processes," Freudenthal Institute for Science and Mathematics Education, Utrecht University, September 10–13.

Abrahamson, D. (2012, September). *Some affordances of embodied interaction for mathematics teaching and learning*. Presentation at the colloquium of Center for Research in Mathematics and Science Education at San Diego State University (joint graduate program with University of California at San Diego), October 5, 2012.

Abrahamson, D. (2013, January). *Learning is moving in new ways*. Invited presentation at the seminar of Dr. Tobin White, University of California at Davis.

Abrahamson. D. (2013, November). *Learning is moving in new ways: Mathematics learning as motor problem solving in designed fields of promoted action*. Invited presentation in the joint colloquium series of the Technologies in Education graduate program at the University of Haifa (O. Golan & S. Barsilai, Coordinators) and the Learning in a NetworKed Society (LINKS) Israeli Center of Research Excellence (Y. Kali, Director), November 11, 2013.

Abrahamson, D. (2014, January). *Toward a taxonomy of design genres: Fostering mathematical insight via perception-based and action-based experiences*. Invited lecture at the Forum for Educational Technology at the Graduate School of Education, Tel Aviv University, January 13, 2014.

Abrahamson, D. (2014, January). *Toward a taxonomy of design genres: Fostering mathematical insight via perception-based and action-based experiences* (S. Kapon, *Organizer*; H. Alexander, *Respondent*). Invited seminar at the Faculty of Education, Haifa University, January 16, 2014.

Abrahamson, D. (2014, January). *One project—many spotlights: Design-based research as an academic arena for dialectic discourse among theoretical approaches* (individual contribution to the closing panel). In B. Eilam & T. Goldberg (Organizers & Chairs), "The learning sciences: between teaching, learning, and design" (single day mini-conference and workshop). University of Haifa: Department of Education, January 29, 2014.

Abrahamson, D. (2014, March). *Embodied cognition and the learning sciences* (webinar). International Society of the Learning Sciences: Network of Academic Programs in the Learning Sciences (NAPLeS), March 13, 2014.

Abrahamson, D. (2014, March). *Toward a taxonomy of design genres: Fostering mathematical insight via perception-based and action-based experiences*. Invited seminar at the School of Education, The College for Academic Studies in Or Yehuda, Israel, March 25, 2014.

Abrahamson, D. (2014, May). *Toward a taxonomy of design genres: Fostering mathematical insight via perception-based and action-based experiences*. Invited seminar at the Department of Science Teaching, The Weizmann Institute of Science, Rehovot, Israel, May 18, 2014.

Abrahamson, D., & Sánchez–García, R. (2014, June). Learning is moving in new ways: An ecological dynamics view on learning across the disciplines. In A. Bakker, M. F. Van der Schaaf, S. Shayan, & P. Leseman (symposium Chairs), *Embodied design in education*. Freudenthal Institute for Science and Mathematics Education, University of Utrecht, The Netherlands, June 23, 2014.

Abrahamson, D. (2014, June). *Toward a taxonomy of design genres: Fostering mathematical insight via perception-based and action-based experiences*. Invited seminar at the Freudenthal Institute of Science and Mathematics Education, University of Utrecht, The Netherlands, June 24, 2014.

Abrahamson, D. (2014, Oct.). *Embodied design: Opportunities for deep learning across the disciplines*. Invited keynote at the Teaching and Learning Center Day 2014, University of California at San Francisco, October 9, 2014.

Abrahamson, D. (2014, Dec.). *Developing embodiment theory of mathematics learning: Evolution of a design-based research project*. Invited presentation for the Taiwanese delegation to the Graduate School of Education. Berkeley, CA, December 4, 2104.

Abrahamson, D. (2015, Feb.). *Developing embodiment theory of mathematics learning: Evolution of a design-based research project*. In B. Schneider (Instructor), "Beyond bits and atoms" (graduate seminar). Stanford: Transformational Learning Technology Lab (Blikstein, Director), Feb. 6, 2105.

Abrahamson, D. (2015, Feb.). *A body of knowledge: Grounding mathematical concepts in embodied interaction*. Invited presentation at "Making lasting memories: Using brain science to boost memory, thinking and learning" (Learning and the Brain conference). San Francisco, February 13, 2015.

Abrahamson, D. (2015, Oct.). *Cultivating mathematical concepts: Insights from ecological dynamics*. In A. Bakker, M. F. Van der Schaaf, S. Shayan, & P. Leseman (symposium Chairs), Embodied design in education. Utrecht University, October 16, 2015.
https://www.youtube.com/watch?v=sguGH7rqm_M&list=PLeplcmKS2i3SmsDm651Uz-HOZwpPmpFea&index=7

Abrahamson, D. (2016, Jan.). *Design by theory, theory by design: Evolution of a design-based research project*. Invited lecture in the course "Beyond Bits and Atoms" (P. Blikstein, Instructor). Learning, Design, and Technology program at the Graduate School of Education, Stanford, Jan. 28, 2016.

Abrahamson, D. (2016, July). *The ecological dynamics of mathematics education: The emergence of proportional reasoning in fields of promoted action*. In W. van Dooren & G. Williams (Chairs, Topic Study Group 27: Learning and Cognition in Mathematics). Invited keynote lecture presented at the 13th quadrennial meeting of International Congress of Mathematics Education, Hamburg, Germany, July 24–31.

Abrahamson, D. (2016, Oct.). *Learning is moving in new ways: Designing for guided emergence of mathematical concepts in interactive learning environments*. Invited talk given a BI Norwegian Business School delegation, hosted by UC Berkeley's Principal Leadership Institute (Program for Visiting School Leaders, Learning Exchange Program). UC Berkeley, October 7, 2016.

Abrahamson, D. (2016, Nov.). *Milestones and musing from movement to math: Attentional anchors, frames of reference, and grounding meaning*. Graduate School of Education, University of Wisconsin at Madison, November 30, 2016.

Abrahamson, D. (2017, Feb.). *Giving back to theory: Attentional anchors as a case of ontological innovation in design-based research*. Invited lecture in the course "Beyond Bits and Atoms" (P. Blikstein, Instructor). Learning, Design, and Technology program, Graduate School of Education, Stanford, Feb. 16, 2017.

Abrahamson, D. (2017, May). *Applying design research concepts from mathematics education to teaching procedural skills in medical education.* Invited keynote lecture at the MedEd Grand Rounds, UCSF Medical Center, Parnassus, San Francisco, May 8, 2017.
https://lecture.ucsf.edu/ets/Play/1e68c252baca471fba006907102858391d

Abrahamson, D. (2017, Oct.). *Enculturating movement: From sensorimotor schemes to mathematical structures.* Invited seminar on embodiment, Behavioral Studies Colloquia (M. Kapur, Host), ETH, Zurich, October 24.

Abrahamson, D. (2017, Oct.). *Learning is moving in new ways: Designing for physical coordination of mathematical concepts*. Invited keynote lecture at the "Cognitive Adventures" conference, Copernicus Science Centre, Warsaw, Poland, October 26 – 27.

Abrahamson, D. (2017, Oct.). *Embodied design: Developing a research program.* Invited keynote lecture in A. Bakker, M. v.d. Schaaf, S. Shayan, R. Alberto, & P. Leseman (Organizers), "Embodied design in interaction" conference. Utrecht University, October 30.

Abrahamson, D. (2017, Dec.). *Designing for learning: A view from educational research*. Invited lecture at the New York Hall of Science, NYC, Dec. 18, 2017.

Abrahamson, D. (2019, March). *A new world: Educational research on the sensorimotor roots of mathematical reasoning*. Invited plenary at the inaugural annual meeting of the regional chapter of the International Group for the Psychology of Mathematics Education (PME) & Yandex. Moscow, Russia, March 18–21, 2019.

Abrahamson, D. (2019, April). *Learning is moving in new ways: Designing for the emergence of proto-mathematical sensorimotor perceptual structures.* Invited talk at the weekly seminar of the Berkeley Institute of Design (Eric Paulos, Director). University of California, Berkeley.

Abrahamson, D. (2019, April). *Moving perception forward in learning sciences discourse*. Invited keynote at "Mathematical ability," the annual meeting of the Digital Turn in Epistemology group. Freudenthal Institute, Utrecht University, The Netherlands, April 15 – 17, 2019.

Abrahamson, D. (2019, April). *A new world: Educational research on the sensorimotor roots of mathematical reasoning*. Invited keynote at the annual Graduate School of Education Research Day, UC Berkeley, April, 19, 2019.

Abrahamson, D. (2019, May). *Moving perception forward in learning sciences discourse*. Invited paper presented at The Future of Embodied Design for Mathematical Imagination and Cognition (NSF-funded synthesis and design workshop, M. Nathan, PI). University of Madison, WI, May 20–22.

Abrahamson, D. (2019, September). *A new world: Educational research on the sensorimotor roots of mathematical reasoning*. Invited seminar at the AIMS colloquium series, "Moving, making & meaning: Conversations on mathematics, science, technology, and the arts," AIMS Center for Math & Science Education, Fresno, CA, September 12, 2019.

Abrahamson, D. (2019, October). *SpEED: Special education embodied design*. Invited seminar in C. Giaconi & F. Gomez Paloma (Conveners, educational sciences colloquia), University of Macerata, Italy, October 8, 2019.

Abrahamson, D. (2019, October). *Building attentional anchors: Educational design-based research on the sensorimotor roots of mathematical reasoning.* In F. Gomez Paloma (Chair), International Conference on Embodiment and School, University of Salerno at Fisciano, Italy, October 10, 2019.

Abrahamson, D. (2019, November). *A new world: Educational research on the sensorimotor roots of mathematical reasoning*. Invited keynote lecture at the annual Learning Science and Future Education Forum, Graduate School of Education, Peking University, Beijing, November 17, 2019.

Abrahamson, D. (2019, November). *Educational vision: Teachers and students co-imagining mathematical objects*. Invited keynote lecture at ICORE7: The 7th International Conference on Research in Education, University of the Punjab, Lahore, Pakistan, November 19–21, 2019.

Abrahamson, D. (2020, March). *Embodied design: Bringing forth mathematical perceptions*. Invited lecture at Loughborough University, UK, March 25. [postponed, COVID-19]

Abrahamson, D. (2020, March). *Take a chance on embodied design: From perceptual primitives to conceptual probability*. Invited graduate seminar at Loughborough University, UK, March 26. [postponed, COVID-19]

Abrahamson, D. (2020, March). *Learning is moving in new way: Reaching for mathematical concepts*. Invited public lecture at Loughborough University, UK, March 26. [postponed, COVID-19]

Abrahamson, D. (2020, April). *Cultivating the emergence of perceptual structures facilitating dexterity: Mathematics as conceptual choreography*. Invited lecture (A. R. Jensenius, Facilitator), Rhythm rises: Sociocultural functions perceptuomotor spatiotemporality. RITMO, University of Oslo, April, 22. [postponed, COVID-19]

Abrahamson, D. (2020, July). *Embodied design: Brining forth mathematical perceptions*. Invited lecture at the 14th International Congress on Mathematical Education (ICME-14), Shanghai, July 12–19. [postponed, COVID-19]

Shvarts, A., Abrahamson, D., Nemirovsky, R., Sinclair, N., & Walkington, C. (2020, July). *How do movements of bodies and artifacts emerge in mathematics education (Discussion Group)*. Paper presented at the 14th International Congress of Mathematics Education (ICME14), Shanghai. [postponed, COVID-19]

Abrahamson, D. (2020, September). *Learning is moving in new ways: Envisioning digital horizons for mathematics education*. Paper presented in the Matific webinar series for the Indian Principals Network (G. Yadav, Founder and Moderator), September 30.

Abrahamson, D. (2020, December). *Education as negotiation: The case of basic probability*. Invited lecture in C. Foster (Organizer), Loughborough University Mathematics Education Network (LUMEN). Loughborough University, UK. https://www.lboro.ac.uk/services/lumen/professional-development/

Abrahamson, D., & Dutton, E. (2021, January). *Toward an enactivist mathematics pedagogy: a research–practice dialogue*. In M. Lawson (Organizer), Lectures in mathematics education, University of Southern California Rossier School of Education, January 14.

Abrahamson, D. (2021, February). *Embodied learning*. Invited lecture in B. Schneider (Instructor), T538—Learning designs that make you rethink learning. Harvard Graduate School of Education.

Tancredi, S., Chen, R. S. Y., Krause, C., & Abrahamson, D. (2021, March). *Getting up to SpEED: Special education embodied design for sensorially equitable inclusion*. Invited keynote in F. Gomez Paloma (Convener), Inclusion Week. University of Macerata, Italy, March 16, 2021.

Abrahamson, D. (2021, August). *Building attentional anchors: Educational design-based research on the sensorimotor roots of mathematical reasoning.* In S. Þorgeirsdóttir (Chair), Training in Embodied Critical Thinking summer school, University of Iceland, Reykjavik, August 12, 2021. [On bus back from Seltún]

Abrahamson, D. (2021, September). *On beyond base-10 blocks? Embodied design applies to college*. Invited lecture at "Professional development for undergraduate mathematics instructors"—the 2nd workshop of Embodied Mathematics, Imagination, and Cognition (EMIC II), Colorado State University, Fort Collins, CO, September 25–26. (NSF-EHR-DUE, Grant #1835409)

Krause, C., Tancredi, S., Chen, R. S. Y., Cooper, B., Foley, E., Anton, J., Kim, J., & Abrahamson, D. (2021, October). *Catching up with SpEED: Applying a framework for inclusive equitable learning opportunities through Special Education Embodied Design*. Invited keynote in F. Gomez Paloma (Convener), Inclusion Week. University of Macerata, Italy, October 25, 2021.

Abrahamson, D. (2021, November). *Building attentional anchors: Educational design-based research on the sensorimotor roots of mathematical reasoning*. Invited lecture in R. Irwansyah (Chair) & S. Sariyasa (Organizer), "Enhancing sustainable development through innovation and Creativity"—the 4th International Conference on Innovative Research Across Disciplines (ICIRAD), The Institute for Research and Community Services, Ganesha University of Education, Bali, Indonesia, November 3–4, 2021.

Abrahamson, D. (2021, November). *Education as negotiation: The case of basic probability*. Invited lecture at The Delhi Public School Society: Human Resource Development Centre http://www.dpsshrdc.org/, November 12, 2021

Abrahamson, D. (2021, November). *Learning is moving in new ways: Designing the perceptual grounding of mathematical concepts*. Invited lecture in M. J. Spivey (Organizer), *Mind, Technology & Society* (Cognitive and Information Sciences Department Colloquia). University of California Merced, November 29, 2021.

Abrahamson, D. (2021, December). *Education as negotiation: The case of basic probability*. Invited lecture at edWeb.net, December 1, 2021.

Abrahamson, D. (2022, February). *Learning is moving in new ways: Designing the perceptual grounding of mathematical concepts*. Invited lecture in J. Cooper (Chair), the annual meeting of the Jerusalem Conference on Research in Mathematics Education, Lev Academic Center, Jerusalem, Israel, February 9–10, 2022.

Abrahamson, D. (2022, March). *Building attentional anchors: Educational design-based research on the sensorimotor roots of mathematical reasoning*. Invited lecture in S. Greenstein (Convener), Doctoral Seminar, Department of Mathematics, Montclair State University, March 22, 2022.

Lambert, S. G., Tancredi, S., Fiedler, B. L., Gorlewicz, J. L., Abrahamson, D. (2022, March). *Building the Quad: A tangible manipulative for inclusive geometry learning*. In F. Gomez Paloma (Chair), Inclusion week (symposium). University of Macerata, Italy, March 30.

Lambert, S. G., Tancredi, S., Fiedler, B. L., Gorlewicz, J. L., Abrahamson, D. (2022, April). *Building the Quad: A tangible manipulative for inclusive geometry learning*. In F. C. Peluso (Chair), The 2nd International Conference on Research on Educational Neuroscience: School, Sports, & Society (REN). Rome, Italy, April 1. [Best Paper award]

Abrahamson, D. (2022, May). *Attentional anchors: Grounding mathematical concepts in perceptual solutions to motor coordination problems*. In D. Abrahamson, & A. R. Jensenius (Organizers), Rhythm rises: Perception, action, cognition, sociality. RITPART workshop at RITMO research center, University of Oslo, May 23–27, 2022.

Abrahamson, D. (2022, July). *Attentional anchors: Grounding mathematical concepts in perceptual solutions to motor coordination problems*. In B. Elon & R. Zohar (Organizers), Batsheva de Rothschild Workshop on Embodied Cognition and Learning in STEAM (Science, Technology, Engineering, Art and Mathematics) Education. Tzuba, Israel, July 6–7.

Abrahamson, D. (2022, October). *Attentional anchors: Grounding mathematical concepts in perceptual solutions to motor coordination problems*. In K. Alexander (Organizer), Mathematics and Mathematics Education Colloquium Series, Teachers College, Columbia University, October 3.

Abrahamson, D. (2022, October). *Attentional anchors: Grounding mathematical concepts in perceptual solutions to motor coordination problems*. In E. Y.-L. Do (Organizer), the ATLAS Institute colloquium series, University of Colorado Boulder, October 11.

Abrahamson, D. (2022, October). *Attentional anchors: Grounding mathematical concepts in perceptual solutions to motor coordination problems*. Keynote lecture in Beth Dykstra VanMeeteren & Carolyn Hildebrandt (Chairs), "Constructing an understanding of how the world works"—the annual conference of the Association for Constructivist Teaching, Regents' Center for Early Developmental Education at the University of Northern Iowa, October 22.

d. Non-Refereed Invited Workshops

Abrahamson, D. (2018). Educational theory [5 x 2 hr. interactive presentations]. In I. Iłowiecka-Tańska (Organizer). *Prototyping seminar for education practitioners.* Warsaw, Poland: Copernicus Science Center, June 28 – July 3).

Abrahamson, D., Hartmann, B., & Paulos, E. (Organizers) (2019, May). *Futures of academic making: Connecting educational research and practice*. Symposium held at the Jacobs Institute for Design Innovation, University of California Berkeley, May 3, 2019.

Abrahamson, D. (2021, September). *On beyond base-10 blocks? Embodied design applies to college*. In H. Soto (Chair & Organizer), the 2nd meeting of Embodied Mathematics Imagination and Cognition, Fort Collins, CO, September 25–26.

Abrahamson, D., & Jensenius, A. R. (Organizers) (2022, May). Rhythm rises: Perception, action, cognition, sociality. RITPART workshop at RITMO research center, University of Oslo, May 23–27, 2022.

Moore, E., Gorlewicz, & Abrahamson, D. (2022, June). *Human–computer relationships (HCR)*. Retreat, Saint Louis University in St. Louis, MO, USA, June 12-15, 2022.

e. Non-Refereed White Papers, Technical Reports, and Educational Software

Abrahamson, D. & Wilensky, U. (2003). Participatory Simulation Guide: *S.A.M.P.L.E.R.*

S.A.M.P.L.E.R., Statistics As Multi-Participant Learning-Environment Resource, is a computer-based probability-and-statistics networked classroom learning activity. The document, a user manual for S.A.M.P.L.E.R. facilitators, details the rationale, interface features, and suggested activities. Activity designed and programmed by author at the Center for Connected Learning and Computer-Based Modeling (Wilensky, Director). http://ccl.northwestern.edu/ps/guide/Computer%20Part%20Sims%20Guide.pdf

Abrahamson, D., & Wilensky, U. (2002). *ProbLab*. The Center for Connected Learning and Computer-Based Modeling, Northwestern University, Evanston, IL.

ProbLab is a suite of 30 innovative, interactive, fully documented, computer-based activities designed and developed by the author, through iterated studies, for students learning probability and basic statistics. Activities include 'Participatory Simulation Activities,' in which an entire networked classroom collaborates, each student operating their own avatar, in a group inquiry into mathematical phenomena, within a shared virtual space. Most of these activities are also accessible online, in the form of guided activities with Java applets embedded in html http://ccl.northwestern.edu/curriculum/ProbLab/index.html

Abrahamson, D., & Howison, M. (2009). *Mathematical Imagery Trainer for Proportion (MIT-P)*. The Embodied Design Research Laboratory, University of California, Berkeley.

The Mathematics Imagery Trainer is an interactive technological system, wherein task-based physical inquiry activities shift into mathematical register. Students use a Natural User Interface, such as Wii remote control or tablet multi-touch, to discover bimanual coordination patterns that achieve, and then conserve, a target feedback. In the Mathematical Imagery Trainer for Proportion (MIT-P), users need to coordinate a bimanual proportional action pattern that keeps a computer monitor green. Later, symbolic artifacts, such a grid and numerals, are overlaid on the screen, and student engage these, thus shifting into formal articulation of proportional relations. The system has been used successfully with individual and paired students in laboratories as well as in controlled experiments with whole classrooms in public schools.

Abrahamson, D. (2018). *Design heuristics for pedagogical artifacts: An introduction to embodied design*. White paper prepared for the Research Division at the Copernicus Science Center, Warsaw, Poland.

Nathan, M.J., Williams-Pierce, C., Walkington, C., Abrahamson, D., Ottmar, E., Soto, H., & Alibali, M.W. (2019). DCL Synthesis and Design Workshop: The Future of Embodied Design for Mathematical Imagination and Cognition. White paper to appear at https://circlcenter.org/events/synthesis-design-workshops, and submitted to the Rapid Community Report series (https://repository.isls.org/handle/1/1229).

PhET Interactive Simulations. (2021). *Ratio and Proportion*. https://phet.colorado.edu/en/simulation/ratio-and-proportion

3. Book Chapters

Fuson, K. C., & Abrahamson, D. (2005). Understanding ratio and proportion as an example of the Apprehending Zone and Conceptual-Phase problem-solving models. In J. I. D. Campbell (Ed.), *Handbook of mathematical cognition* (pp. 213–234). New York: Psychology Press.

Abrahamson, D. (2011). Towards instructional design for grounded mathematics learning: The case of the binomial. In N. L. Stein & S. Raudenbush (Eds.), *Developmental cognitive science goes to school* (pp. 267–281). New York: Taylor & Francis / Routledge.

Trninic, D., & Abrahamson, D. (2013). Embodied interaction as designed mediation of conceptual performance. In D. Martinovic, V. Freiman, & Z. Karadag (Eds.), *Visual mathematics and cyberlearning* (Mathematics education in the digital era, Vol. 1, pp. 119–139). New York: Springer.

Abrahamson, D. (2014). Rethinking probability education: perceptual judgment as epistemic resource. In E. J. Chernoff & B. Sriraman (Eds.), *Probabilistic thinking: Presenting plural perspectives* (pp. 339–260). New York: Springer.

Abrahamson, D., & Lindgren, R. (2014). Embodiment and embodied design. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences (2nd ed.)* (pp. 358–376). Cambridge, UK: Cambridge University Press.

Fuson, K. C., Murata, A., & Abrahamson, D. (2015). Using learning path research to balance mathematics education: Teaching/learning for understanding and fluency. In R. Cohen Kadosh & A. Dowker (Eds.), *The Oxford handbook of numerical cognition* (pp. 1036–1054). Oxford, UK: Oxford University Press.

Abrahamson, D. (2015). The monster in the machine, or why educational technology needs embodied design. In V. R. Lee (Ed.), *Learning technologies and the body: Integration and implementation in formal and informal learning environments* (pp. 21–38). New York: Routledge.

Abrahamson, D., & Trninic, D. (2015). Working out: Mathematics learning as motor problem solving in instrumented fields of promoted action. In A. A. diSessa, M. Levin, & N. J. S. Brown (Eds.), *Knowledge and interaction: A synthetic agenda for the learning sciences* (pp. 212–235). New York, NY: Routledge.

Shayan, S., Abrahamson, D., Bakker, A., Duijzer, A. C. G., & Van der Schaaf, M. F. (2017). Eye-tracking the emergence of attentional anchors in a mathematics learning tablet activity. In C. A. Was, F. J. Sansosti, & B. J. Morris (Eds.), *Eye-tracking technology applications in educational research* (pp. 166–194). Hershey, PA: IGI Global.

Abrahamson, D. (2017). Embodiment and mathematics learning. In K. Peppler (Ed.), *The SAGE encyclopedia of out-of-school learning* (pp. 247–252). Thousand Oaks, CA: SAGE.

Abrahamson, D. (2018). Teaching design research as a case of cultivating a community of professional practice. In A. Bakker (Ed.), *Design research in education: A practical guide for early career researchers* (pp. 153–171). Abingdon, UK: Routledge.

Rosen, D. M., Palatnik, A., & Abrahamson, D. (2018). A better story: An embodied-design argument for generic manipulatives. In N. Calder, N. Sinclair, & K. Larkin (Eds.), *Using mobile technologies in the learning of mathematics* (pp. 189–211). New York: Springer.

Abrahamson, D., Zolkower, B., & Stone, E. (2020). Reinventing RME at Berkeley: Emergence and development of a course for pre-service teachers. In M. van den Heuvel-Panhuizen, P. Drijvers, M. Doorman, & M. van Zanten (Eds.), *Reflections from abroad on the Netherlands didactic tradition in mathematics education* (255–277). Berlin: Springer International.

DeLiema, D., Dahn, M. Flood, V. J., Abrahamson, D., Enyedy, N., Steen, F. F. (2020). Debugging as a context for collaborative reflection on problem-solving processes. In E. Manalo (Eds.), *Deeper Learning, Communicative Competence, and Critical Thinking: Innovative, Research-Based Strategies for Development in 21st Century Classrooms* (pp. 209–228). New York, NY: Routledge.

Murata, A., Fuson, K. C., & Abrahamson, D. (2020). A learning path framework to balance mathematics education: Teaching/learning for understanding and fluency. In E. Arias Ortiz, J. Cristia, & S. Cueto (Eds.), *Learning mathematics in the XXI century: Adding technology to the equation* (pp. 61–96). Washington, DC: Inter-American Development Bank.

Abrahamson, D. (2020). Syntonicity and emergence: A design-based research reflection on the Piagetian roots of constructionism. In N. Holbert, M. Berland, & Y. Kafai (Eds.), *Designing constructionist futures: The art, theory, and practice of learning designs* (pp. 311–322). Cambridge, MA: MIT Press.

Flood, V. J., Shvarts, A., & Abrahamson, D. (2022). Responsive teaching for embodied learning with technology. In S. Macrine & J. Fugate (Eds.), *Movement matters: How embodied cognition informs teaching and learning* (pp. 179–195). MIT Press.

Hutto, D. D., & Abrahamson, D. (2022). Embodied, enactive education: Conservative versus radical approaches. In S. Macrine & J. Fugate (Eds.), *Movement matters: How embodied cognition informs teaching and learning* (pp. 39–52). MIT Press.

Abrahamson, D., Dutton, E., & Bakker, A. (2022). An enactivist account of mathematics learning. In S. A. Stolz (Ed.), *The body, embodiment, and education: An interdisciplinary approach* (pp. 156–182). Routledge.

Abrahamson, D., & Lindgren, R. (2022). Embodiment and embodied design. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences (3nd Edition)* (pp. 301–320). Cambridge University Press.

Abrahamson, D. (2022). Enactive perception as mathematics learning. In M.-C. Shanahan, B. Kim, M. A. Takeuchi, K. Koh, A. P. Preciado-Babb, & P. Sengupta (Eds.), *The Learning Sciences in conversation: Theories, methodologies, and boundary spaces* (pp. 153–170). Routledge.

Shvarts, A., & Abrahamson, D. (in press). Dual-eye-tracking Vygotsky: A microgenetic account of a mathematics-tutorial case study as a teaching/learning collaboration. In L. Edwards (Eds.), *The body in mathematics: Theoretical and methodological lenses*. Brill.

Tancredi, S., Abdu, R., Balasubramaniam, R., & Abrahamson, D. (in press). Intermodality in multimodal learning analytics for cognitive theory development: A case from embodied design for mathematics learning. In M. Giannakos, D. Spikol, D. Di Mitri, K. Sharma, X. Ochoa, & R. Hammad (Eds.), *Multimodal learning analytics*. Springer.

Chapters Under Review / in Preparation

Abrahamson, D., Tancredi, S., Chen, R. S. Y., Flood, V. J., & Dutton, E. (under review). Embodied design of digital resources for mathematics education: Theory, methodology, and framework of a pedagogical research program. In B. Pepin, G. Gueude, & J. Choppin (Eds.), *Handbook of digital (curriculum) resources in mathematics education*. Springer.

Abrahamson, D., Ryokai, K., & Dimmel, J. K. (in preparation). Learning mathematics with digital resources: Reclaiming the cognitive role of physical movement. In B. Pepin, G. Gueude, & J. Choppin (Eds.), *Handbook of digital (curriculum) resources in mathematics education*. Springer.

4. Non-Refereed Contributions to Educational Publications

McManaman, Y., Droujkova, M., & Salazar, E. (2013). *Moebius noodles: Adventurous math for the playground crowd.* Cary, NC: Delta Stream Media, an imprint of Natural Math. ISBN 978-0-9776939-5-5

VanHattum, S. (Ed.) (2015). *Playing with math: Stories from math circles, homeschoolers, and passionate teachers.* Cary, NC: Delta Stream Media, an imprint of Natural Math. ISBN 978-0-9776939-3-1

Droujkova, M. (in press). *Multiplication explorers*. Cary, NC: Delta Stream Media, an imprint of Natural Math.

Awards and Fellowships

Title:	*Seeing Chance: Fostering Student Implicit Knowledge Towards Fluency in the Domain of Probability and Statistics*
PI:	Dor Abrahamson
Agency:	Spencer / National Academy of Education: Postdoctoral Fellowship
Date:	2005-2006
Amount:	$65,000

Title:	*Bridges, Deepening Knowledge: Engaging Novices, Practicing Teachers, and Researchers in Inquiry Together* (Award #201600105)
PI:	Dor Abrahamson
Co-PI:	Elisa Stone

Agency: Spencer / National Academy of Education: Small Grant
Date: 2005 – 2006
Amount: $50,000

Title: *Statistics-Major Students' Probabilistic Intuitions*
PI: Dor Abrahamson
Agency: UC Berkeley Committee on Research Faculty Research Grants
Date: 2007-2008
Amount: $6,000

Title: *Embodied Mathematical Learning*
PI: Dor Abrahamson
Agency: UC Berkeley Committee on Research Faculty Research Grants
Date: 2008-2009
Amount: $5,000

Title: *Tacit–Cultural Synthesis in Mathematics Learning*
PI: Dor Abrahamson
Agency: UC Berkeley Committee on Research Faculty Research Grants
Date: 2009-2010
Amount: $7,000

Title: *Scaling up the Mathematical Imagery Trainer Design*
PI: Dor Abrahamson
Agency: UC Berkeley Committee on Research Faculty Research Grants
Date: 2010-2011
Amount: $9,000

Title: *Three-Day Workshop With Karl Newell*
PI: Dor Abrahamson
Agency: Barbara White Bequest
Date: 2016
Amount: $6,996

Title: *Research Opportunity Focused on Learning*
PI: Tom Griffiths
Co-PI: Dor Abrahamson, John Campbell, Anca Dragan, David Feinberg, Jack Gallant, Alison Gopnik, Geoffrey Lee, Tania Lombrozo, Michel Maharbiz, Terry Regier, Linda Wlbrecht
Agency: UC Berkeley Vice Chancellor for Research Opportunities
Date: 2017 – 2019
Amount: $300,000

Title: *Gesture Enhanced Virtual Agent Mathematics Tutor* (#1320029)
PI: Michael Neff, UC Davis
Co-PI: Dor Abrahamson

Agency: National Science Foundation: CyberLearning #1321042
Date: 2013 – 2017
Amount: $558,000 (includes 2 REUs)

Title: *Collaborative Research: Debugging Failure: Fostering Youth Academic Resilience in Computer Science* (#1612660)
PI: Melissa Chen, 9 Dots Community Learning Center, Los Angeles
Co-PI: Dor Abrahamson, Noel Enyedy, Francis Steen
Agency: National Science Foundation: AISL
Date: 2016 – 2019
Amount: $645,314 (includes 2 REUs)

Title: *Investigation into the Perceptual Expertise of a Robotic Surgeon: How do we learn to feel what we see*?
PI: Courtney A. Green, MD Department of Surgery, UCSF 513
Co-PI: Patricia O'Sullivan, EdD
Co-investigator Dor Abrahamson
Agency: The Association for Surgical Education Foundation: (CESERT) Center for Excellence in Surgical Education, Research and Training
Date: 2017-2018
Amount: $21,850

Title: *Visiting Scholar: Anna Shvarts, Lomonosov Moscow State University*
PI: Dor Abrahamson
Agency: Barbara White Bequest
Date: 2018
Amount: $2,360

Title: *Visiting Scholar: Harry Heft, Denison University*
PI: Dor Abrahamson
Agency: Barbara White Bequest
Date: 2018
Amount: $3,100

Title: *Synthesis and Design Workshop: The Future of Embodied Design for Mathematical Imagination and Cognition*
PI: Mitchell Nathan, University of Wisconsin, Madison
Co-PIs: Dor Abrahamson, Martha Alibali, David Landy, Erin Ottmar, Hortensia Sotto, Candace Walkington, Caro Williams–Pierce
Agency: National Science Foundation: DRL #1824662
Date: May 20 – 22, 2019
Amount: $99,995

Title: *Signs of Mathematics: Fostering the Emergence of Conceptual Gesture Among Deaf Students*
PI: Dor Abrahamson (Co-PI Christina Krause)

Agency: 007104 European Union/European Commission (Marie Curie)
Date: 2019 – 2021
Amount: $40,674

Title: *Eye-Tracking the Guided Emergence of Perceptual Structures for Mathematical Reasoning*
PI: Dor Abrahamson
Agency: UC Berkeley Institute of Cognitive and Brain Sciences
Date: 2020
Amount: $4,000

Title: *An Enactivist Micro-Phenomenological Investigation of Diagrammatic Reasoning*
PI: Dor Abrahamson (with Julien Putz)
Agency: UC Berkeley Institute of Cognitive and Brain Sciences
Date: 2022

Recognitions

- Outstanding Reviewer, *Journal of Research in Mathematics Education*, 2013
- Best Reviewer, *Journal of the Learning Sciences*, 2015
- Best Paper, *International Conference of the Learning Sciences*, 2016
- Best Submission, *CSUN AT* 2021. Dr. Arthur I. Karshmer Award for Assistive Technology Research: "Award winners are honored for their exemplary submission and excellence in research and the advancement of assistive technology."
    - Lambert, S. G., Fiedler, B. L., Hershenow, C. S., Abrahamson, D., & Gorlewicz, J. L. (2022). A tangible manipulative for inclusive quadrilateral learning. *The Journal on Technology and Persons with Disabilities, 10,* 66–81.
- Best Paper, *REN 2022*
    - Lambert, S. G., Tancredi, S., Fiedler, B. L., Gorlewicz, J. L., Abrahamson, D. (2022, April). *Building the Quad: A tangible manipulative for inclusive geometry learning*. In F. C. Peluso (Chair), The 2nd International Conference on Research on Educational Neuroscience: School, Sports, & Society (REN). Rome, Italy, April 1.

Editorials and Reviews

- Member of the Editorial Board / Panel of the following journals:
    1. *Digital Experiences in Mathematics Education* (Editorial Board)
    2. *Educational Designer* (Associate Editor)
    3. *Educational Studies in Mathematics* (Editorial Board)
    4. *Frontiers in Education* (STEM Education) (Associate Editor)

5. *International Journal of Child–Computer Interaction* (Associate Editor)
6. *International Journal of Science and Mathematics Education*
7. *Journal of the Learning Sciences* (Editorial Board)
8. *Journal for Research in Mathematics Education (2018–2021)*
9. *Mathematics Thinking and Learning* (Editorial Board)
10. *PLOS ONE*
11. *Technology, Knowledge, and Learning (2005–2013)*
12. *Thinking Skills and Creativity* (Editorial Board)
13. *The Journal of Mathematical Behavior* (Editorial Board)

- Ad hoc Reviewer for the following journals:

1. *Adaptive Behavior*
2. *Assistive Technology*
3. *Behaviour & Information Technology*
4. *British Journal of Educational Technology*
5. *Bulletin of Education and Research (U. Punjab)*
6. *Canadian Journal of Science, Mathematics, and Technology Education*
7. *Cognition*
8. *Cognition and Instruction*
9. *Cognitive Development*
10. *Cognitive Science*
11. *Cognitive Systems Research*
12. *Computers & Education*
13. *Computers in Human Behavior*
14. *Educational Evaluation and Policy Analysis*
15. *Educational Psychologist*
16. *Educational Psychology Review*
17. *Educational Researcher*
18. *Education Sciences*
19. *Educational Technology Research and Development*
20. *For the Learning of Mathematics*
21. *Frontiers in Psychology*
22. *Human Development*
23. *Implementation and Replication Studies in Mathematics Education*
24. *Instructional Science*
25. *International Journal of Computer-Supported Collaborative Learning*
26. *International Journal of Mathematical Education in Science and Technology*
27. *International Journal of Research in Education and Science*
28. *Journal of Cognitive Enhancement*
29. *Journal of Computational Social Science*
30. *Journal of Educational Psychology*
31. *Journal of Learning Analytics*
32. *Journal of Mathematical Psychology*
33. *Journal of Numerical Cognition*
34. *Journal of Science Education and Technology*

35. *Journal of Statistics Education*
36. *Journal of Teacher Education*
37. *Learning & Instruction*
38. *Learning: Research and Practice*
39. *Mathematics*
40. *Mathematics Education Research Journal*
41. *Mind, Brain, and Education*
42. *New Ideas in Psychology*
43. *Phenomenology and the Cognitive Sciences*
44. *Psychology of Language and Communication*
45. *Research in Developmental Disabilities*
46. *Research in Mathematics Education*
47. *Review of Educational Research*
48. *Reflective Practice*
49. *Science*
50. *Science Education*
51. *Statistics Education Research Journal*
52. *Sustainability*
53. *Symmetry*
54. *Synthese*
55. *Systems*
56. *Teaching and Teacher Education*
57. *Technology, Knowledge and Learning*
58. *Transactions on Computer–Human Interactions (ACM)*
59. *Transactions on Learning Technologies (IEEE)*
60. *Western Journal of Nursing Research*
61. *ZDM—The International Journal on Mathematics Education*

- Regular Reviewer or Senior Reviewer of conference proceedings proposals for:

1. AERA – American Educational Research Association
2. C&C – Cognition & Creativity
3. CHI – Computer–Human Interaction
4. CSCL – Computer-Supported Collaborative Learning (PC Member)
5. CSEDU – International Conference on Computer Supported Education
6. CogSci (PC Member)
7. FabLearn – Digital Fabrication in Education
8. JPS – Jean Piaget Society
9. ICEduTech – International Conference on Educational Technologies
10. ICLS – International Conference of the Learning Sciences (PC Member)
11. IDC – International Conference for Interaction Design and Children—Co-Chair IDC 2017
12. iLRN – Immersive Learning Research Network
13. PME-NA – North-American Chapter of the International Group for the Psychology of Mathematics Education ("Technology" Strand Leader)
14. TEI: Tangible, Embedded, and Embodied Interaction

- Occasional reviewer (nominations, fellowship, grants, etc.) for:
  1. Canada Research Chairs
  2. France–Berkeley Fund
  3. Israel Science Foundation
  4. The National Academy of Education / Spencer
  5. The National Science Foundation (e.g., Cyberlearning, DRK-12)
  6. Spencer Foundation / National Academy of Education
  7. Swiss National Science Foundation
  8. United States–Israel Binational Science Foundation

Professional Memberships

- AERA – American Educational Research Association
  - Special Interest Groups: Advanced Technology and Learning; Learning Sciences: Research in Mathematics Education; Semiotics
- BCNM – Berkeley Center for New Media
- BiD – Berkeley Institute of Design
- ICBS – UC Berkeley's Institute of Cognitive and Brain Sciences
- ISDDE – International Society for Design and Development in Education
- ISLS – International Society of the Learning Sciences
- JPS – Jean Piaget Society
- PME-NA – North-American Chapter of the International Group for the Psychology of Mathematics Education

Advisory

- *Advisory Board Member:* Title: "Advancing end-user programming with expertise sharing tools"; PI: Bjoern Hartmann (University of California, Berkeley), National Science Foundation: CAREER, 2012–2017.
- *Advisory Board Member*: "Embodied explanatory expressions for facilitating science reasoning and enhancing interactive simulations"; PI: Robb Lindgren (University of Illinois at Urbana–Champaign), National Science Foundation—Education Core Research, 2014–2018.
- *Participant*: "Move2Learn: Engaging preschool scientists through embodiment and technology" (Planning Grant); PI: Judy Brown, Frost Museum of Science; National Science Foundation—Science Learning + (Advancing Informal Science Learning) Program, 2014–2015.
- *Advisory Board Member*: "Local ground: a contextually grounded approach for learning data science skills"; PI Tappan Parikh (University of California, Berkeley); National Science Foundation: Cyberlearning, 2013–2016.
- *Advisory Board Member*: "Action geometry"; PIs: Mitchell Nathan & Peter Steiner (University of Wisconsin at Madison) and Candice Walkington (Southern Methodist University); Institute for Educational Sciences.
- *Advisory Board Membe*r: "Intelligent representations: How to blend physical and virtual representations by adapting to the individual student's needs in real time";

PI: Martina Rau (University of Wisconsin, Madison), National Science Foundation: CAREER, 2016 – 2019.

- *Advisory Board Member*: "Making for mathematical learning"; PIs Steven Greenstein & Eileen Férnandez (Montclair State University). NSF DRK–12, 2019–2021.
- *Advisory Board Member*. Digital turn in epistemology. Freudenthal Institute, Utrecht University, The Netherlands. 2017–present.
- *Advisory Board Member*. Research Department, Copernicus Science Center, Warsaw, Poland. 2016–present.
- *Scientific Board Member*. Matific.com, Australia. 2017–present.
- *Scientific Consultant*. Funexpected.com, Moscow, Russia. 2019–present.

Graduates—PhD (Chair)

- Sneha **Veeragoudar Harrel** (2009)
  - *Second chance at first life: Fostering the mathematical and computational agency of at-risk youth*
- José Francisco **Gutiérrez** (2015)
  - *Signs of power: A critical approach to the study of mathematics cognition and instruction*
  - Faculty, University of Utah
- Timothy **Charoenying** (2015)
  - *Fostering embodied coherence: A study of the relationship between learners' physical actions and mathematical cognition*
- Dragan **Trninic** (2015)
  - *Body of knowledge: Practicing mathematics in instrumented fields of promoted action*
  - Faculty, ETH
- Yu-Ting **Siu** (2015)
  - *A virtual water cooler: The ecology of an online community of practice to support teachers' informal learning*
  - Faculty, San Francisco State University
- Kiera Naomi Phoebe **Chase** (2106)
  - *Building algebra one giant step at a time: Toward a reverse-scaffolding pedagogical approach for fostering subjective transparency through engineering levels of interaction with a technological learning environment*
  - ConnectEd
- Elizabeth K. **Guneratne** (2016)
  - *From instrumental genesis to digital exodus: Supporting urban elementary teachers through technology-mediated systemic reform*
- Roni **Zohar** (2018)
  - *Motor skills, creativity, and cognition in learning physics concepts*
  - Postdoctoral Researcher, Weizmann Institute
- Virginia J. **Flood** (2020)
  - *Gesture as a dialogic resource in STEM instructional interaction*
  - Faculty, University at Buffalo, NY

- Alyse D. **Schneider** (2021)
  - *Roting Teachers: Constructivist math pedagogy and the development of non-teaching experts in teaching in the United States, 1820-1910*
- Leah F. **Rosenbaum** (2021)
  - *Design and theory of diverse forms of participation in mathematics through Geometris, a collaborative, body-scale game*
  - Postdoctoral Researcher, MIT
- Amelia (Milly) **Farid** (2022)
  - *Undergraduate Students' Definitional Practices in Mathematics*
  - Postdoctoral Researcher, MIT

Graduates—MA (Chair)

- Karl **Mauks–Koepke** (2008)
  - *The double-edged sword of constructivist designs*
- Ban **Tang** (2008)
  - Toward fostering understanding for the meaning of fraction multiplication
- Ian **Thacker** (2010)
  - *Not too slippery a slope: Fostering student grounding of the mathematics of slope in perceptions of steepness*
- Becky **Blessing** (2010)
  - *Math moves: A lesson in embodied functions*
- Jasmine **Alvarez** (2012)
  - *So what if I'm a girl?: Changing the female attitude towards mathematics through interpretive discussion.*
- Rebecca **Benjamin** (2012)
  - *Believing is seeing: Tradeoffs of modeling-based mathematical learning*
- Adam **Brown** (2012)
  - *Learning to learn: Contextual factors in study-skills intervention*
- Andrea G. Negrete (2013)
  - *Toward didactical contracts for mathematics learning with digital media: coordinating pedagogical design and classroom practices*
- Rosa G. **Lee** (2013)
  - *Negotiating mathematical visualizations in classroom group work: The case of a digital design for proportion*
- Ellen **Smrekar** (2016)
  - *Open mathematical problems in the classroom: A teacher's guide*
- Matt **Heid** (2016)
  - *I* see *what you mean: A dimensionalization of multimodal revoicing interactions*
- Haley **Kavanaugh** (2016)
  - *Lost in translation: Algebra tiles and equations—an interview-based critical evaluation of a would-be instructional support*
- Elizabeth **Dutton** (2018)

    - *Mathematics learning as perceptual reconstruction: the role of semiotic breakdown in collaborative problem solving*
- Maryam **Shadmehr** (2018)
    - *Learning mathematics by reconciling complementary perceptual constructions of a common display: The case of an innovative design for complex numbers*