CURRICULUM VITAE

Sofia Tancredi

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CURRENT POSITION

2024-present **Wisconsin Center for Education Research** **Madison, WI**
University of Wisconsin, Madison
Postdoctoral Fellow
RISE postdoctoral training program in inclusive math education rooted in an integrative theory of learning (funded by NSF-STEM Education)
Mentors: Martha Alibali (Psychology), Nicole Louie (Curriculum and Instruction)

EDUCATION

May 2024 **University of California Berkeley & San Francisco State University**
Joint PhD program in Special Education (Learning Sciences & Human Development training at UCB, Special Education training at SFSU)
Embodied Design Research Laboratory, PI: Dor Abrahamson
Dissertation: Sensory differentiation for equitable inclusion: Designing for balance as the nexus of sensory regulation and embodied mathematics learning

May 2014 **Harvard University**
B.A. in Literature, secondary field: Mind, Brain, Behavior

PREVIOUS EMPLOYMENT

2019-2024 **University of California, Berkeley** **Berkeley, CA**
Graduate Student Instructor
Introduction to Cognitive Science; Cultivating Cognitive Development

2019 **Design the Future (DC Design and Stanford d.school)** **Palo Alto, CA**
Design Coach
Coached summer youth team in co-designing an accessibility tool with & for a user

2014-2018 **Axiom Learning & Learning Efficiency** **CA, MA, and Malaysia**
Vice President (2016-2018) - head of curriculum design, professional development and training, data systems, global community partnerships, client relations
Manager (2015-2016) - head of education for California region
Faculty (2014-2015) - taught neurodiverse K-12 children 1-on-1 & in small-groups

PUBLICATIONS

Refereed Journal Articles

Tancredi, S. (conditionally accepted). Sensory-Adaptive Embodied Design: Towards integrating movement for sensory regulation and conceptual learning.

The Mattering Collective (Louie, N., Her, C., Fenta, S., Ferguson, C., Luu, R., Tancredi, S., & Huang, S.) (2026). The Poetry of connection and care in a participatory research project. *Journal of Participatory Research Methods, 7*(1). https://doi.org/10.35844/001c.155828

Abdu, R., Tancredi, S., Abrahamson, D., & Balasubramaniam, R. (2025). Demonstrating mathematics learning as the emergence of eye–hand dynamic equilibrium. In M. Schindler, A. Shvarts, & A. Lilienthal. (Eds.), Eye-tracking research in mathematics education [Special issue]. *Educational Studies in Mathematics*. https://doi.org/10.1007/s10649-023-10279-0

Tancredi, S. & Abrahamson, D. (2024). Stimming as thinking: A critical reevaluation of self-stimulatory behavior as an epistemic resource for inclusive education. In B. de Koning, S. Sepp, & S. Zhang (Eds.), Human movement and learning [Special issue]. *Educational Psychology Review 36*, 75. https://doi.org/10.1007/s10648-024-09904-y

Tancredi, S. (2024). Balance Board Math: Exploring the sense of balance as a basis for functions and graphing and number line concepts. *Digital Experiences in Mathematics Education 10,* 202–227. https://doi.org/10.1007/s40751-024-00140-1

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

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). https://doi.org/10.3280/ess1-2021oa11818

Tancredi, S., Abdu, R., Abrahamson, D., & Balasubramaniam, R. (2021). Modeling nonlinear dynamics of fluency development in an embodied-design mathematics learning environment with Recurrence Quantification Analysis. *International Journal of Child-Computer Interaction*, 100297. https://doi.org/10.1016/j.ijcci.2021.100297

Book Chapters

Abrahamson, D., Tancredi, S., Chen, R. S. Y., Flood, V. J., Dutton, E. (2024). Embodied design of digital resources for mathematics education: Theory, methodology, and framework of a pedagogical research program. In: Pepin, B., Gueudet, G., Choppin, J. (eds) *Handbook of digital resources in mathematics education.* Springer International Handbooks of Education. Springer, Cham. https://doi.org/10.1007/978-3-030-95060-6_8-1

Tancredi, S., Abdu, R., Balasubramaniam, R., & Abrahamson, D. (2022). 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. https://doi.org/10.1007/978-3-031-08076-0_6

Tancredi, S., Chen, R. S. Y., Krause, C., & Siu, Y.–T. (2022). The need for SpEED: Rationale and guiding principles for Special-Education Embodied Design. In S. Macrine & J. Fugate (Eds.), *Movement matters: How embodied cognition informs teaching and learning.* M.I.T. Press. https://doi.org/10.7551/mitpress/13593.003.0021

Refereed Conference Proceedings

(* indicates undergraduate or graduate mentees)

Tancredi, S. & Alibali, M. (accepted for June, 2026). Symbol grounding and re-grounding in balance and movement: Insights from children's mathematical compositions. *International Society for the Learning Sciences (ISLS),* (Vol. "Long papers"). Los Angeles, CA.

Tancredi, S., Doherty, C., Tennison, J., Fiedler, B., Gorlewicz, J. & Abrahamson, D. (2026). Blind and visually impaired learners' spatial explorations and imaginations with haptic technologies in STEM education co-design. *American Education Research Association - AERA 2026* (Vol., "Round tables").

Zhang, F.* & Tancredi, S. (2025). Predicting electrodermal activity from conceptual and physical activity in an embodied learning environment. *Proceedings of the Cognitive Science Society 2025 (Cogsci 2025)* (Vol. "Posters"). San Francisco, CA.

Tancredi, S. & Serrano Rodriguez, J.* (2025). Becoming the graph: Changes in children's gestures following dynamic, whole-body graphing activities. *American Education Research Association – AERA 2025, (*Vol. "Papers"). Boulder, Colorado.

Sar-Israel, M.*, Zhang, F. E.*, Liu, Y.*, & Tancredi, S. (2024). Tracking sensory regulation during embodied learning with electrodermal activity. *Proceedings of the 18th International Conference of the Learning Sciences – ICLS 2024* (Vol. "Short papers"). International Society for the Learning Sciences (ISLS), Buffalo, NY.

Tancredi, S., Li*, H.T., Wang* J. X., Liu*, Y., & Serrano Rodriguez*, J. S. (2023). Beyond 'just sitting there': Function addition through collaborative balance sensory activity with Balance Board Math. *American Education Research Association – AERA 2023* (Vol. "Posters"). Chicago, IL.

Tancredi, S., Wang*, J. X., Li*, H. L., Yao,* C. J., Macfarlan*, G. L., & Ryokai, K. (2022). Balance Board Math: "Being the graph" through the sense of balance for embodied self-regulation and learning. In M. Horn, M. Giannakos, & T. Pontual (Eds.), *Proceedings of IDC '22: Interaction Design and Children* (Vol. "Full papers", pp. 137–149). https://doi.org/10.1145/3501712.3529743

Tancredi, S., Wang*, J., Li*, H. T., Yao*, C. J., Ryokai, K., & Abrahamson, D. (2022). Graphing with Balance Board Math: Critical embodied design for regulation and learning. *Proceedings of the 16th International Conference of the Learning Sciences – ICLS 2022* (Vol. "Short papers"). Hiroshima, Japan.

Tancredi, S., Abdu, R., Abrahamson, D., & Balasubramaniam, R. (2021). Proof of concept: Applying recurrence quantification analysis to model nonlinear dynamics of mathematics learning in an embodied design. In E. de Vries, J. Ahn, & Y. Hod (Eds.), *Reflecting the past and embracing the future—Proceedings of the annual conference of the International Society of the Learning Sciences - ICLS 2021* (Vol. "Posters"). Ruhr-Universität Bochum.

UNDER REVIEW

Tancredi, S., Anton, J., Videla Reyes, R., & Abrahamson, D. (Under review). Inclusive embodied design for mathematics students.

Tancredi, S., McClennahan, C., Her, C., Luu, R., Huang, S., Fenta, S., & Louie, N. (Under review). Reflexivity as poetic process: Attuning to the relational shaping of research and researchers toward social transformation.

Abrahamson, D., Tancredi S., Xiao, Z., Weiss, M., Potęga vel Żabik, K., & Dimmel, J. (Under revision). It's our move: Mathematical perception emerges for coordinating joint action.

Tancredi, S. & Alibali, M. W. (under review). Embodied math cognition. [book chapter]

GRANTS & FELLOWSHIPS

2024-2027 **National Science Foundation Research on Innovative Technologies for Enhanced Learning (NSF-RITEL)**
"TeleTangibles: Flexible, Inclusive Tangibles to Bring Sensorimotor Interaction Back into STEM Education" (#2418738)
National Science Foundation, $900,000
Co-author, collaborator, consultant

2019-2024 **National Science Foundation Graduate Research Fellowship Program (NSF-GRFP)**
"Math and Movement: Integrating Sensory Regulation and Conceptual Learning"
National Science Foundation, $138,000
Individual 5-year fellowship. Track: math education

2022 **Ignite Innovation Catalyst Grant**
"Balance Board Math" prototype development
The Jacobs Institute for Design Innovation, $1,800
Project director

2021 **Spark Innovation Catalyst Grant**
"Balance Board Math" initial prototyping
The Jacobs Institute for Design Innovation, $500
Project director

2018 **Gates K-12 Education Grant**
"Learning Efficiency Acceleration Program: Axiom Learning + Summit collaboration"
Bill and Melinda Gates Foundation, $1,084,674
Project Co-PI

Under review **National Science Foundation Research on Innovative Technologies for Enhanced Learning (NSF-RITEL)**

"Collaborative Research: AI-Empowered Learning: Sensory-Profile-Based Video Lecture Adaptation for Students with ADHD through Multimodal AI"
National Science Foundation
Senior personnel

SCHOLARSHIPS, HONORS, & AWARDS

- **Professional Development Award,** 2025 *Wisconsin Center for Education Research* $800 Departmental professional development award
- **Special Education Scholarship Fund,** 2023 *San Francisco State University* $1,000 Individual merit scholarship
- **ISLS Doctoral Consortium,** 2023 *International Society for the Learning Sciences,*
    - Selected for doctoral consortium workshop, sponsored ISLS attendance
- **AERA SIG-ATL/LS Mentee** 2023 *American Educational Research Association- Advanced Technologies for Learning & Learning Sciences Special Interest Groups*
    - Selected for participation in AERA mentorship program
- **Bell Burkhardt Daro Shell Centre Design Award,** 2022 *International Society for Design and Development in Education* $1,000
    - Design award for Aspiring Educational Designers in Science, Technology, Engineering, and Mathematics
- **APA Travel Award,** 2019 *American Psychological Association* $600 Sponsorship to attend "Advanced Training Institute on Nonlinear Methods in Psychological Science" workshop at University of Cincinnati
- **CA-CEC Student Scholarship,** 2018 *California Council for Exceptional Children* $200 Sponsorship to attend state conference

INVITED TALKS AND WORKSHOPS

(⇔ denotes a research-to-practice focused presentation)

Tancredi, S., Tenison, J., and Smith, T. L. (2025, February). *Exploring multimodality in interaction: multimodal charades.* Session at the Human-Computer Relations at Work Tactile and Embodied Learning Workshop. Atlanta, GA.

Abrahamson, D., & Tancredi, S. (2025, February). *Gentle steps from sensation to concepts.* Session at the Human-Computer Relations at Work Tactile and Embodied Learning Workshop. Atlanta, GA.

Tancredi. S. (2024, November). Exploring adaptive vestibular sensory stimulation for sensory seeking and inclusive embodied learning. Invited talk for the Gliga Lab, University of East Anglia.

⇔Tancredi, S. (2024, July). E*mbodied Design for Inclusion: Special Education Embodied Design (SpEED).* Invited workshop for Weiming Education Group (35 school principals, international school principals and district leaders from Weiming, China). Berkeley, California.

Tancredi, S. (2024, May). Beyond sensory periodization: Sensorimotor pathways for neurodivergent learners of mathematics. In Dorothy Cowie (chair), *How diverse sensorimotor experiences shape behavior and the brain*. Jean Piaget Society conference. Toronto, Canada.

Tancredi, S. (2023, December). *Math learning as intermodal coordination: A dynamical systems analysis of learning with embodied design interactive technology.* Invited colloquium talk, RiSE Center's STEM Education Research Colloquium (virtual), University of Maine, December 4, 2023.

Tancredi, S. (2023, November). *Opportunities with nonlinear methods and embodied learning data.* Invited talk, Human-Computer-Relations at Work Network Community Meeting (virtual), November 15, 2023.

⇔Tancredi, S. & Lee, S. (2023, November). *Embodied learning for special education students: A research-practice conversation.* Invited interview, Special Education Network Inclusion Association (SENIA) Beijing 2023 Conference.

⇔Tancredi, S. (2022, July). *Balance Board Math: A design-based research project cultivating "being the graph" through the sense of balance.* Invited talk, Centrum Nauki Kopernik (Copernicus Science Center), Warsaw, Poland.

Palmer, C., Tancredi, S., Upham, F. (2022, May). *Complex data analysis.* Invited talk, RITPART Workshop: Rhythm Rising, RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion, University of Oslo, Norway, May 24, 2022.

Chen, R. S. Y., & Tancredi, S. (2022, May). *Special Education Embodied Design (SpEED).* Invited workshop, RITPART Workshop: Rhythm Rising, RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion, University of Oslo, Norway, May 24, 2022.

⇔Krause, C.M., Chen, R. S. Y., Tancredi, S., 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 workshop, Unimc for Inclusion Settimana dell'inclusione (Inclusion Week), University of Macerata, Italy.

⇔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.

ADDITIONAL CONFERENCE PARTICIPATION

Non-Proceedings Conference Presentations

Tancredi, S. (under review). Feeling math together: Reimagining the senses in conceptual learning. *Play, Make, Learn,* (Vol. "Individual Presentations"). Madison, WI.

The Mattering Collective. (accepted for 2026, June). Reflexivity as collaborative poetic process. *International Society for the Learning Sciences (ISLS),* (Vol. "Arts Gallery & Performance"). Los Angeles, CA.

Luu, R. & Tancredi, S. (accepted for 2026, June). Who gets to be concrete? Problematizing "concrete" learners. In Charlotte Muller & Julia Chatain (co-chairs), Investigating, understanding, and generating concreteness in STEM education. *International Society for the Learning Sciences (ISLS),* (Vol. "Symposia"). Los Angeles, CA.

Tancredi, S. (2025, August). Balance Board Math: Collaborative balance experiences for learning about functions. *Play, Make, Learn,* (Vol. "Playful Demo"). Madison, WI.

Tancredi, S. (2025, June). Neurodivergent embodied STEM learning: Stimming as an epistemic and interactional resource. In Sofia Tancredi (chair), Charting the Learning Sciences Neuroverse: Theorizing and Building Neurodiversity-Affirming STEM Education. *International Society for the Learning Sciences (ISLS) 2025,* (Vol. "Symposia"). Helsinki, Finland.

Tancredi, S., Benally, J., & Krause, C. (2024, June). Towards epistemological pluralism in math education: The embodied resources and practices of marginalized students. In Sofia Tancredi and Morgan Vickery (co-chairs), Learning for Every Body: Intersectional Dimensions of Embodied Learning. *International Society for the Learning Sciences (ISLS),* (Vol. "Symposia"). Buffalo, NY.

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. **[awarded best paper]**

Tancredi, S. (2021, May). Balance Board Math: Vestibular-activating movement as mathematical activity. In R. S. Y. Chen, C. Krause, & S. Tancredi, *SpEEDing towards equitable instruction: Special Education Embodied Design for sensory diversity,* Uncommon Senses III: Back to the Future of the Senses, (Vol. "Symposia"), Montreal, Canada.

Tancredi, S. & Chen, R. S. Y. (2019, May). *Centering disability and neurodiversity in embodied design*. The EMIC Synthesis and Design Workshop: The Future of Embodied Design for Mathematical Imagination and Cognition, University of Wisconsin–Madison, Madison, WI.

Tancredi, S. (2019, January) *Sensory regulation and embodied design*. AccessCyberlearning Capacity Building Institute, Seattle, WA.

TEACHING AND MENTORING

Teaching and Course Design

2025 *Service with Youth in STEM*
Undergraduate lecture course with practicum (20 students)
Instructor
University of Wisconsin, Madison

2024 *Designing for Embodied Learning*
Graduate module
Course designer
Norwegian University of Science and Technology

2021-2024 *Cultivating Cognitive Development: The Sensorimotor Origins of Concepts*
Graduate seminar (Spring 2021, 2022, 2024) (4-25 students)
Course co-designer and co-instructor
University of California, Berkeley

2019 *Introduction to Cognitive Science*

Undergraduate lecture course (300 student course; taught two 25-student sections)
Graduate Student Instructor
University of California, Berkeley

Mentorship

2024-present UW–Madison: **4** undergraduate students
2020-2025 UC Berkeley: 10 undergraduate students; 3 graduate students
2015-2018 Axiom Learning: 29 direct reports

LEADERSHIP/ACTIVITIES/SERVICE

Service to Profession

Professional organizations

Associate Chair, *Association for Computing Machinery: Interaction Design and Children,* 2026
Equity and Justice Committee member, *International Society for the Learning Sciences,* August 2025-present
Finance Committee member, *International Society for the Learning Sciences,* July 2025-present

Ad-hoc peer reviewer

Journal of the Learning Sciences • Cognition and Instruction • Learning, Culture and Social Interaction • Digital Experiences in Mathematics Education • New Ideas in Psychology • International Journal of Science and Mathematics Education • Journal of Mathematics Teacher Education • Canadian Journal of Science, Mathematics, and Technology Education • Possibility Studies and Society • International Society for the Learning Sciences • Interaction Design and Children • IEEE Transactions on Learning Technologies

Conference Symposia and Colloquia organized

Nathan, M. Kokushkin, V., Tancredi, S., Dimmel, J., Greenstein, S., & Hernandez, E. (Co-chair) (2025, October). *Embodied mathematical imagination and cognition (EMIC) research colloquium.* Colloquium for the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA).

Tancredi, S. (Chair) & Lewis, K. (Discussant) (2025, June 12). *Charting the learning sciences neuroverse: Theorizing and building neurodiversity-affirming STEM education.* Symposium for the International Society for the Learning Sciences (ISLS), Helsinki, Finland.

Krause, C. (Chair) & Tancredi, S. (Discussant) (2024, September 4). *The way it makes me feel - embodied educational designs for grounding conceptual learning and interaction.* Symposium presented for the Future Education Conference, Graz, Austria.

Tancredi, S. & Vickery, M. (Co-chair) (2024, June 11). *Learning for every body: Intersectional dimensions of embodied learning.* Symposium presented for the International Society for the Learning Sciences (ISLS), Buffalo, NY.

Tancredi, S., Chen, R. S. Y., & Krause, C. (Co-chair) (2021, May 6-9). *SpEEDing towards equitable instruction: Special Education Embodied Design for sensory diversity.* Symposium presented for Uncommon Senses III: Back to the Future of the Senses, Montreal, Canada.

Tancredi, S., Chen, R. S. Y., & Krause, C. (Co-chair) (2020, February 2). *The need for SpEED: Special Education Embodied Design*. Symposium presented for the The Conference for University of California Center for Research on Special Education, Disabilities, and Developmental Risk (UC-SPEDDR), Los Angeles, CA.

Service to Department and Campus

- Postdoctoral representative, *Committee on Disability Access & Inclusion*, UW Madison, September 2025-present
- Volunteer, *Play, Make, Learn* conference, UW Madison, March-August 2025
- Organizer, "Co-Design Day for Neurodiversity-Inclusive Learning", *Berkeley School of Education*, September 2024
- Lab coordinator, *Embodied Design Research Lab*, Berkeley School of Education, 2018-2022
- Editor, *Berkeley Review of Education*, Berkeley School of Education, 2019-2020
- Convener, Special Education Embodied Design graduate working group, *Berkeley School of Education*, 2019-2021

Campus Talks and Guest Lectures

Tancredi, S. (2026, March). *Sensory experiences of math learning.* Interdisciplinary Training Program in Education Sciences, University of Wisconsin-Madison.

Tancredi, S. (2026, February). *Toward grounding math concepts and symbols for diverse bodies.* Developmental Proseminar, Department of Psychology, University of Wisconsin-Madison.

Tancredi, S. (2026, January 27 & 29) *Jean Piaget and constructivism.* Guest lectures for Psychology 502: Cognitive Development. Department of Psychology, University of Wisconsin–Madison.

Tancredi, S., Mclennahan, C., Luu, R., & Her, C. (2025, October 23) *Reflexivity work as poetic process.* Guest lecture for Curriculum & Instruction 975: Arts-Based Education Research, Department of Curriculum and Instruction, University of Wisconsin–Madison.

Tancredi, S. (2025, May). *Make it sensational: Instruction that taps into students' sensorimotor needs.* Workshop at the Teaching & Learning Symposium, University of Wisconsin-Madison.

Tancredi, S. (2023, November). *Somatosensory stimulation and conceptual learning: Towards modeling and accommodating sensory neurodiversity.* Invited talk for the Kidd Lab, Psychology Department, University of California, Berkeley.

Krause, C.M., Chen, R. S. Y., Tancredi, S., Cooper, B., Foley, E., Anton, J., Kim, J., & Abrahamson, D. (2022, October). *Catching up with SpEED: Applying a framework for inclusive equitable learning opportunities through Special Education Embodied Design.* Invited colloquium talk for the Graduate Group in Science and Mathematics Education (SESAME) Colloquium, Berkeley School of Education, University of California Berkeley.

Tancredi, S., Chen, R., Krause, C. (2021, November). *The Need for SpEED: Special Education Embodied Design*. Invited colloquium talk for the Graduate Group in Science and Mathematics Education (SESAME) Colloquium, Berkeley School of Education, University of California Berkeley.

Tancredi, S. (2019, December 11) *Interdisciplinary collaboration.* Guest lecture for Special Education 909: Current Issues in Special Education Policy and Practice. Department of Special Education, San Francisco State University, CA.

ADDITIONAL TRAINING

STEM Public Service Fellowship *Wisconsin Institute for Science Education and Community Engagement (WISCIENCE).* 12-month training fellowship with community-engaged teaching practicum, Jan-Dec 2025

Postdoctoral Training Course in Scientific Leadership *University of Wisconsin-Madison Office of Postdoctoral Studies*. 2-semester leadership and mentoring course, Sept 2024-Feb 2025

Advanced Training Institute on Nonlinear Methods in Psychological Science *University of Cincinnati*. 1-week intensive methods training course, June 2019

PROFESSIONAL ASSOCIATIONS

International Society of the Learning Sciences (ISLS)

American Educational Research Association (AERA) –

- *Division C: Learning and Instruction*
- *SIG- Learning Sciences / Advanced Technologies for Learning*

Tactile Media Alliance (TMA) - (HQ: Georgia Tech)

Human Computer Relationships @Work for Learning (HCR@Work) - (HQ: CU Boulder)