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
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

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

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

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

Tancredi, S., Doherty, C., Tennison, J., Fiedler, B., Gorlewicz, J. & Abrahamson, D. (Accepted for April, 2026). Blind and visually impaired learners' spatial explorations and imaginations with haptic technologies in STEM education co-design. *Advanced Technologies for Learning SIG at American Education Research Association - AERA 2026.*

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.

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

SCHOLARSHIPS, HONORS, & AWARDS

2023 **Special Education Scholarship Fund**
San Francisco State University, $1,000
Individual merit scholarship

2023 **ISLS Doctoral Consortium**
International Society for the Learning Sciences, sponsored ISLS attendance
Selected for doctoral consortium workshop

2023 **AERA SIG-ATL/LS Mentee**
American Educational Research Association- Advanced Technologies for Learning & Learning Sciences Special Interest Groups
Selected for participation in AERA mentorship program

2022 **Bell Burkhardt Daro Shell Centre Design Award**
International Society for Design and Development in Education, $1,000
Design award for Aspiring Educational Designers in Science, Technology, Engineering, and Mathematics

INVITED TALKS

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. Invited conference presentation in Dorothy Cowie (chair), *How diverse sensorimotor experiences shape behavior and the brain*. Jean Piaget Society conference. Toronto, Canada.

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.

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.

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

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

Tancredi, S. (2025). 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). 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, Montreal, Canada.

Research Workshop Presentations

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. Georgia Tech, Atlanta, GA.

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. Georgia Tech, Atlanta, GA.

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. (2023). *Towards sensory-seeking-inclusive mathematics design.* Human-Computer Relations at Work Workshop. University of Colorado Boulder, Boulder, Colorado.

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.

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.

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, 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
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)
Course co-designer and co-instructor
University of California, Berkeley

2019 **Introduction to Cognitive Science**

Undergraduate lecture course
Graduate Student Instructor: taught two weekly 25-student sections
University of California, Berkeley

Mentorship

2024-present UW–Madison: 2 undergraduate students

2020-2025 UC Berkeley: 10 undergraduate students; 3 graduate students

2015-2018 Axiom Learning: 29 direct reports

LEADERSHIP/ACTIVITIES/SERVICE

Service to Department and Campus

Postdoctoral representative, CDAI committee, 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
Panelist, graduate student orientation, Berkeley School of Education, August 2023
Lab coordinator, Embodied Design Research Lab, Berkeley School of Education, 2018-2022
Editor, Berkeley Review of Education, Berkeley School of Education, 2019-2020
Note-taker, Disabled Student Program, Berkeley School of Education, Spring 2019

Service to Profession

Professional organizations

Finance Committee member, *International Society for the Learning Sciences,* July 2025-present

Ad-hoc peer reviewer

Journal of the Learning Sciences • 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. (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-chairs) (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-chairs) (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-chairs) (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.