Sarah H. Kerns, M.S.

Researcher, Contextual Dynamics Lab
Dartmouth College

Chemical and Biological Applications Lead
International FemtoScience, Inc.

Research Associate, ISWYM (I See What You Mean) Lab
Wellesley College

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Website: https://minding-data.github.io

Employment

Researcher, Contextual Dynamics Lab, Dartmouth College, November 2026-present.
PI: Jeremy Manning.

Principal Investigator (PI), Phase I SBIR, DoD Chemical and Biological Defense Program, 2026
Technical Volume Author and Subject Matter Expert (SME)

Chemical and Biological Applications Lead, Human Factors, International FemtoScience, Inc. (femtosci.com; sarah.kerns@femtosci.com), July 2026-present

Research Associate, ISWYM (I See What You Mean) Lab, Wellesley College (prev Human Variation Lab), 2019-present.
PI: Jeremy B. Wilmer.

Research Consultant (via Wilmer Lab, Wellesley College), TestMyBrain.org, 2022-2023.
Independently initiated and led projects in childhood adversity, graph cognition, and construct validity.

Biological applications consultant, FemtoSci, Inc., 2019-2021.
Nanodiamond biological applications and covalently bonded nanodiamond beads for drug delivery.

Research assistant, Akert lab, Wellesley College, 2018-2019.
In-group and prejudice.

Intern, Antimicrobial Discovery Center, Northeastern University, 2018.
Borrelia-inhibitory compounds.

Research assistant, Cheek Lab, Wellesley College, 2017-2018.
Narcissism, manipulation and psychological abuse; courtroom-based observational research.

REU participant, Antimicrobial Discovery Center, Northeastern University, Lewis Lab, summer 2017.
Testing microbial metabolites for antimicrobial action.

Supervised field experience, Veterans Fellowship Program (HDFS 3080), University of Connecticut, Fall 2010.

Reference resource on college veterans' programs and benefits.

Consulting

Consultant, Data Visualization and Measure Design, Educational Testing Service (ETS), 2026

Education

PhD candidate, Cognitive Neuroscience, Dartmouth College, 2023-June 2026 (paused).

MS, Dartmouth College, 2025.

Thesis: Establishment of Face-Specific and General-Distortion Prosopometamorphopsia Types: A New Test, A Multiple Case Study, and Further Investigations.

BA, Psychology and Biochemistry (Honors), Wellesley College, 2019

Honors thesis (Biochemistry): Evaluating Anecdotal Lyme Disease Treatments for Borrelia-inhibitory Properties.

Psychology capstone: Public Comment, Private Blame: The Impact of Social Media on Group-Based Opinion.

Associate in Science, Naugatuck Valley Community College, 2010.

Summa cum laude.

Additional training

2024, ISTSS Institute: The Revised Clinician-Administered PTSD Scale for DSM-5 (CAPS-5-R): Guidelines for Standard Administration and Scoring, Boston, MA, September 25, 2024.

2023, AFNI fMRI data analysis bootcamp, Dartmouth College.

2022, ISTSS Institute: Child-Adult Relationship Enhancement (CARE): Reducing Mental Health Risk and Building Skills for Promoting Resilience in Children and Teens After Trauma.

2022, International Statistical Genetics Workshop (Boulder Statistical Genetic Methods for Human Complex Traits), Institute for Behavioral Genetics, University of Colorado Boulder.

Virtual workshop, June 6-9 and 13-16, 2022. Topics included twin and family models, structural equation modeling, gene-environment interaction, polygenic scores, and multivariate and longitudinal genetic analyses; software included R, OpenMx, PLINK, and GCTA.

2017, REU Leadership Program, Gordon Institute, Northeastern University.

2014, Emergency Medical Technician, MassBay Community College; National Registry of Emergency Medical Technicians certification, 2015 (historical).

1990-1991, Defense Language Institute Foreign Language Center (DLIFLC), U.S. Army; Persian Farsi.

Funding, honors, and awards

Funded contract: DoD Chemical and Biological Defense (CBD) Program SBIR Phase I (Topic CBD254-006), "Deploying Functionalized Nanodiamond Technology in a Low-Cost, Field Expedient, Multi-Wavelength Trace SERS Tactical Flex-Ticket Detection Platform." International FemtoScience.
Role: Principal Investigator and subject-matter expert; author of the technical volume.

Application submitted, LaunchTN FY27 SBIR/STTR Matching Fund (decision pending).
Submitted October 2026. Tactical Flex-Ticket project. Role: PI and subject-matter expert.

Full member, Sigma Xi Research Honor Society, 2026; **associate member**, 2019.

Elsevier/Vision Research Travel Award, Vision Sciences Society, 2021 and 2020 (competitive awardee).

ASBMB Certification Exam, with distinction, American Society for Biochemistry and Molecular Biology, 2019.

Invited member, Psi Chi Psychology Honor Society, 2019.

Invited member, Phi Theta Kappa Honor Society, 2010.

Board of Trustees Medal, Naugatuck Valley Community College, awarded at graduation, 2010.

National Defense Service Medal, 1991.

Publications and Presentations

2026

Wilmer, J. B., **Kerns, S. H.**, Widdup, L., & Nakayama, K. Graphs of averages provoke exaggerated and divergent interpretations; showing the data helps. Journal article, under review, Proceedings of the National Academy of Sciences (PNAS). Preprint: Wilmer, J. B., **Kerns, S. H.**, Widdup, L., & Nakayama, K. (2026). Graphs of averages exaggerate and sow disagreement. PsyArXiv. https://doi.org/10.31234/osf.io/4nyh5_v2

Fortner, S., Mello, A., Stehr, D., Kodiweera, C., Jung, H., **Kerns, S.**, Bujarski, K., Wager, T., & Duchaine, B. (2026). A case study of early-emerging prosopometamorphopsia. Journal article, Cognitive Neuropsychology, 1-20. Advance online publication. https://doi.org/10.1080/02643294.2026.2755076

Wang, Y., **Kerns, S. H.**, Brady, T. F., & Wilmer, J. B. (2026). Average-Blindness and Ensemble-Acuity: When Plotted Raw Data Conveys Averages Better Than Plotted Averages. Preprint, PsyArXiv. https://doi.org/10.31234/osf.io/2xrw3_v2

Wilmer, J. B., **Kerns, S. H.**, Widdup, L., & Nakayama, K. (2026). Graphs of averages exaggerate and sow disagreement. Preprint, PsyArXiv. https://doi.org/10.31234/osf.io/4nyh5_v2

Kerns, S., & Wilmer, J. Behind the Bar: Stars, Means, and the Multiple Faces of the Bar-Tip Limit Error. Talk, Applied Vision Science (AVS) Meeting, Visualization & User Interface Design session, St. Pete Beach, FL, May 20, 2026, 1:30 pm. Presenter: **S. Kerns**. https://www.appliedvisionscience.org/talk-sessions/

Wilmer, J., et al. Graph miscommunication: How averages distort understanding, and individual values clarify it. Talk, Applied Vision Science (AVS) Meeting, Visualization & User Interface Design session, May 20, 2026, 2:00 pm. Presented by Jeremy Wilmer; **S. Kerns** co-author. https://www.appliedvisionscience.org/talk-sessions/

Mello, A. V. R. G., Stehr, D., **Kerns, S.**, Kodiweera, C., Bujarski, K., & Duchaine, B. Visual Distortions Reveal Dissociable Reference Frames Underlying Face and Object Recognition in the Ventral Visual Pathway. Talk 22.23, VSS 2026, Face and Body Perception: Mechanisms session, May 16, 2026, 11:15 am. Presented by Antonio Mello; **S. Kerns** co-author. https://vss-2026-conclar.pages.dev/people/sarah-kerns

Wilmer, J., **Kerns, S.**, Widdup, L., & Nakayama, K. Graphs of Averages Exaggerate and Sow Disagreement. Talk 21.26, VSS 2026, Perceptual Organization: Segmentation and Grouping session, May 16, 2026, 9:30 am, Talk Room 2. Presented by Jeremy Wilmer; **S. Kerns** co-author. https://vss-2026-conclar.pages.dev/people/sarah-kerns

Wilmer, J., **Kerns, S.**, & Nakayama, K. Graphed Averages Sow Disagreement: The Average Reading of an Average is Atypical. Invited symposium talk in "The quest for 'the average person' in vision science: Promise and pitfalls" (organizers J. Wilmer & M. Herzog), VSS 2026, Talk Room 2, May 15, 2026, 2:05 pm. Presented by Jeremy Wilmer; **S. Kerns** co-author. https://www.visionsciences.org/symposia/

Data-visualization panel (hosted by a separate organization at VSS 2026). Panel.

2025

Kerns, S. H. (2025). Establishment of Face-Specific and General-Distortion Prosopometamorphopsia Types: A New Test, A Multiple Case Study, and Further Investigations. Master's thesis, Dartmouth College. Dartmouth Digital Commons. Also posted as a preprint, PsyArXiv, November 2025. https://doi.org/10.31234/osf.io/peqkc_v1

Wilmer, J. B., & **Kerns, S. H.** (2025). The Uniformity Fallacy: A second common, severe misinterpretation of bar graphs of averages. Peer-reviewed conference proceedings, 47th Annual Meeting of the Cognitive Science Society (CogSci 2025). https://escholarship.org/uc/item/00s8z754

Wang, Y., **Kerns, S. H.**, Brady, T. F., & Wilmer, J. B. (2025). The Paradox of Certainty: When graphed ensembles convey averages better than graphed averages. Peer-reviewed conference proceedings, 47th Annual Meeting of the Cognitive Science Society (CogSci 2025). https://escholarship.org/uc/item/2kh4v05s

Wilmer, J., & **Kerns, S.** Caricature Effect in Data Visualization. Invited demo presentation, VSS 21st Annual Demo Night (demo 16), St. Pete Beach, FL, May 19, 2025. https://www.visionsciences.org/2025-demo-night-2/

Wilmer, J. B., **Kerns, S. H.**, & Nakayama, K. Graphs of Averages Exaggerate and Sow Disagreement. Invited panel presentation; panel speaker and co-organizer (with J. Wilmer, Y. Wang, O. Jiang), Hands-on Data Visualization Brown Bag, VSS 2025 satellite event, St. Pete Beach, FL, May 18, 2025. https://www.visionsciences.org/2025-data-visualization-satellite/

Kerns, S., Mello, A., & Duchaine, B. Two cases of prosopometamorphopsia whose distortions are face-specific in daily life and in testing with 510 object categories. Poster, VSS 2025, St. Pete Beach, FL. Journal of Vision, 25(9), 2911. https://doi.org/10.1167/jov.25.9.2911

Wilmer, J. B., Awrang Zeb, T. B., **Kerns, S. H.**, & Nakayama, K. Visualized averages produce polarized sentiment. Poster, VSS 2025, St. Pete Beach, FL. Journal of Vision, 25(9), 2468. https://doi.org/10.1167/jov.25.9.2468

Wang, Y., Brady, T. F., **Kerns, S. H.**, & Wilmer, J. B. The Paradox of Certainty: Graphed Ensembles Convey Averages Better than Graphed Averages. Poster, VSS 2025, St. Pete Beach, FL. Journal of Vision, 25(9), 2563. https://doi.org/10.1167/jov.25.9.2563 Same project as the CogSci 2025 paper above.

2022

Kerns, S. H., & Germine, L. Exploring the childhood trauma monolith: A large-scale multivariate analysis of childhood adversity. Poster, International Society for Traumatic Stress Studies (ISTSS) Annual Meeting, Atlanta, GA, November 2022.

Kerns, S., Awrang Zeb, T. B., & Wilmer, J. Does the classic flanker task miss the target? Adding spatial jitter reveals a doubling of effect size. Poster, VSS 2022. Journal of Vision, 22(14), 4453. https://doi.org/10.1167/jov.22.14.4453

Wilmer, J., & **Kerns, S.** How bar graphs deceive: Readout-based measurement reveals three fallacies. Poster, VSS 2022. Journal of Vision, 22(14), 3968. https://doi.org/10.1167/jov.22.14.3968

Lee, J. Y., **Kerns, S.**, & Wilmer, J. Bar graphs of mean values produce inflated and variable estimates of effect size. Poster, VSS 2022. Journal of Vision, 22(14), 4432. https://doi.org/10.1167/jov.22.14.4432

Wilmer, J., & **Kerns, S. H.** The Caricature Effect in Graphical Communication. Invited demo presentation, VSS 2022 Demo Night. https://www.visionsciences.org/2022-demo-night/

Co-organizer (with J. Wilmer). Data Visualization Micro-Talk Event, VSS 2022 satellite event, St. Pete Beach, FL, May 14, 2022. https://www.visionsciences.org/2022-vss-data-visualization-satellite/

2021

Kerns, S. H., & Wilmer, J. B. (2021). Two graphs walk into a bar: Readout-based measurement reveals the Bar-Tip Limit error, a common, categorical misinterpretation of mean bar graphs. Peer-reviewed journal article, Journal of Vision, 21(12), 17. https://doi.org/10.1167/jov.21.12.17

Kerns, S., & Wilmer, J. The Bar-Tip Limit Error: A common, qualitative misinterpretation of bar graphs of means revealed by the DDoG method. Poster, VSS 2021. Journal of Vision, 21(9), 2602. https://doi.org/10.1167/jov.21.9.2602

2020

Wilmer, J., & **Kerns, S. H.** The Caricature Effect in Graphical Communication. Demo presentation, VSS 2020 Demo Night. Co-presenter: **S. Kerns**.

Kerns, S., Kim, H., Grinspoon, E., Germine, L., & Wilmer, J. Toward a Science of Effect Size Perception: the Case of Introductory Psychology Textbooks. Poster, VSS 2020. Journal of Vision, 20(11), 1185. https://doi.org/10.1167/jov.20.11.1185 Presenter: **S. Kerns**.

Kerns, S. H., & Wilmer, J. B. Amplified Differences: Systematic Overestimation of Effect Size in Bar Graphs. Poster presentation (poster 64), Eastern Psychological Association (EPA) 91st Annual Meeting, June 17, 2020.

2019

Kerns, S. (2019). Evaluating Anecdotal Lyme Disease Treatments for Borrelia-inhibitory Properties. Honors thesis, Wellesley College. Wellesley College Digital Repository. https://repository.wellesley.edu/object/ir858 Research conducted with the Antimicrobial Discovery Center, Northeastern University.

Kerns, S. H., Gladstone, S., Kallon, H., Muller, S., & Wilfert, T. Public Comment, Private Blame: The Impact of Social Media on Group-Based Opinion. Invited panel presentation of the psychology capstone (PSYC 310R, Fall 2018), Psychology Panel, Ruhlman Conference, Wellesley College, 2019. Presenter: **S. Kerns**. Also given as a video presentation. Accompanying paper: Perception and Externalization of Group-Based Criticism and Praise (PSYC 310R, Fall 2018).

Kerns, S. H. Evaluating Anecdotal Lyme Disease Treatments in Search of Borreliacidal Compounds. Invited panel presentation, Biochemistry Panel, Ruhlman Conference, Wellesley College, 2019.

2018

Kerns, S. H. (2018). Perception and Externalization of Group-Based Criticism and Praise. Psychology capstone research paper, PSYC 310R, Fall 2018, Wellesley College. Unpublished. Presented as "Public Comment, Private Blame: The Impact of Social Media on Group-Based Opinion," Ruhlman Conference, Wellesley College, 2019.

Kerns, S. H. (2018). Effects of Covalent Attachment on Albumin-Teicoplanin Binding in the Context of Drug-Delivery. Poster, Ruhlman Conference, Wellesley College.

2017

Kerns, S. H. Science Writ Small: Antibiotic Research, Immersive Education, and Saving the World. Invited talk, Tanner Conference, Wellesley College, 2017.

Manuscripts in Preparation

Kerns, S. H., & Wilmer, J. B. Behind the Bar: Stars, Means, and the Multiple Faces of the Bar-Tip Limit Error. Manuscript in draft.

Kerns, S. H. Dissociating Face and Ovoid Processing in the Fusiform Face Area Using Prosopometamorphopsia. Manuscript in draft (secondary data collection).

Kerns, S. H., Awrang Zeb, T. B., Mulligan, J., & Wilmer, J. B. Displaced reliability: How flanker reliability was lost and then found. Manuscript in preparation.

Teaching and instruction

Undergraduate and Postbaccalaureate Research Mentor, Dartmouth College, 2023-2025; Wellesley College, 2026-present.

Teaching Assistant, PSYC 11: Laboratory in Psychological Science, Dartmouth College, Spring 2025 and Fall 2025.

Curriculum development manager and content creator, TeLLab2 online teaching platform for data skills and analysis (Wellesley College; tellab.org), 2020-2022.

Development of pedagogical framework, building of teaching modules in experimental design and data visualization, including Stroop, Flanker, and reasoning tasks, creation and optimization of experimental paradigms, grant preparation. **Kerns, S. H.**, & Wilmer, J. B. (2021-2022). TELLab modules, test innovations, and curriculum material.

K-13 teacher and curriculum developer: decades of teaching and creating curricula for elementary, middle, and high school students.

Service

Board of Health, Northfield, MA, 2026-present.

Steward, GOLD (graduate student union), Dartmouth College, October 2025-present.

Conservation Commission, Commissioner, Northfield, MA, 2022-present.

Trustee, GOLD (graduate student union), Dartmouth College, October 2025-November 2026.

Selectboard, Northfield, MA, 2023-2026.

Open Space Committee, Northfield, MA, 2022-2026.

Graduate Student Representative, 2023-2025.

Participant and Guest Lecturer, Graduate Women in Science and Engineering (GWISE) Program, 2023-2024.

Boy Scout instructor, 2018-2023.

Science, public health, conservation among others; merit-badge instruction.

Election Clerk, Millis, MA, 2020-2021.

Copy Editor, Wellesley College Journal of Science, 2016-2017.

Treasurer, Davis Scholar Class Council, 2015-2016.

Leadership Officer and **Deputy Commander for Cadets**, Civil Air Patrol, 2010-2012.

U.S. Army (Desert Storm).

Peer review

IEEE Transactions on Visualization and Computer Graphics, 2026.

Memory & Cognition, 2023-2024.

Conferences Attended

CBRNe Convergence, Knoxville Convention Center, Knoxville, TN, November 3-5, 2026.

Computational Psychiatry Conference, Yale University, New Haven, CT, July 14-16, 2026.

Applied Vision Science (AVS) Meeting, TradeWinds Island Resorts, St. Pete Beach, FL, May 20, 2026.

Vision Sciences Society (VSS) Annual Meeting, St. Pete Beach, FL, 2026.

MODVIS 2026: Computational and Mathematical Models in Vision (VSS satellite workshop), St. Pete Beach, FL, May 13-14, 2026.

Vision Sciences Society (VSS) Annual Meeting, St. Pete Beach, FL, 2025.

International Society for Traumatic Stress Studies (ISTSS) Annual Meeting, Boston, MA, September 25-28, 2024.

International Society for Traumatic Stress Studies (ISTSS) Annual Meeting, Atlanta, GA, November 9-12, 2022.

Vision Sciences Society (VSS) Annual Meeting, St. Pete Beach, FL, 2022.

Vision Sciences Society (VSS) Annual Meeting, 2021.

Vision Sciences Society (VSS) Annual Meeting, June 19-24, 2020.

Eastern Psychological Association (EPA) 91st Annual Meeting, June 17-18, 2020.

Media

Science Friday, NPR radio interview, "Can You Read a Bar Graph?", April 2022.
https://www.sciencefriday.com/segments/bar-graph/

Research Interests

The neuroscience of learning, memory, and forgetting—particularly how what is learned and what is lost shape trauma-related disorders, including PTSD and CPTSD.

Applications of functionalized nanodiamonds, from drug delivery to chemical and biological threat detection.

Data visualization and graph interpretation: changing the world one graph at a time.

Construct validity in psychophysics.

Cross-disciplinary understanding of Borrelia and Lyme disease.

Last updated: November 13, 2026