Megan E. Hillis, Ph.D.

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EDUCATION

Dartmouth College, Guarini School of Graduate and Advanced Studies **2019-2025**
Ph. D. in Cognitive Neuroscience
Dissertation Committee: Dr. David J. M. Kraemer (chair), Dr. Emily S. Finn, Dr. Jeremy R. Manning, & Dr. Rachel G. Pizzie
Dissertation: *Neural patterns reflect semantic representation in novice sign language learners*

Master of Science in Psychological and Brain Sciences
Thesis Committee: Dr. David J. M. Kraemer (chair) & Dr. Donna Coch
Thesis: *Overlapping semantic representations of sign and speech in novice sign language learners*

State University of New York at Geneseo **2015-2019**
Bachelor of Arts in Psychology with Honors, Minor in German Language
GPA: 3.94, summa cum laude
Thesis Advisor: Dr. Jeffrey Mounts
Honors Thesis: *The Dorsal Visual Stream and Object Recognition: Weighing the evidence for dorsal category sensitivity*

Freie Universität Berlin **Jan-May 2018**
European Studies Program, Berlin, Germany
Passed German Language proficiency course at the C1 level

RESEARCH

Dartmouth College **Aug 2019-present**
Cognitive Neuroscience of Learning Lab (PI: David J. M. Kraemer)
Postdoctoral Scholar and Lecturer (June 2025-present)
Graduate Researcher (Aug 2019-June 2025)

- Multidisciplinary research across Psychological & Brain Sciences, Education, and Computer Science departments focused on neural correlates of learning and understanding
- Developed stimuli and led data collection for multiple projects, including behavioral, virtual/mixed reality, mobile EEG, and fMRI paradigms.
- Used Python and R for multivariate data analysis, including with HPC systems
- Mentored undergraduate researchers in study design, data collection, and analysis

State University of New York at Geneseo **Oct 2016-May 2019**
Visual Attention Lab (PI: Jeffrey Mounts)
Undergraduate Research Assistant

- Led data collection multiple studies of behavioral human research focusing on magnocellular vs. parvocellular visual processing.
- Conducted original research project from experiment design to presentation of results
- Used SPSS, R, and Python-based software (PsychoPy) for stimulus creation and data analysis

PUBLICATIONS

Preprints:

Hillis, M. E., & Kraemer, D. J. M. (2025). Initial signs of learning: Decoding newly-learned vocabulary from neural patterns in novice sign language learners. *bioRxiv.* https://doi.org/10.1101/2025.04.11.648265

Cetron, J.S.*, **Hillis, M.E.***, Diamond, S. G., May, V. V., & Kraemer, D. J. M. (under review). First-class learning: Neural patterns reflect students' conceptual grasp following an introductory STEM lesson. *co-authors contributed equally to this work

Published:

Blanchet, J. B., **Hillis, M. E.**, Lee, Y., Shao, Q., Zhou, X., Balkcom, D., & Kraemer, D. J. M. (2025). Enhancing the Educational Potential of Online Movement Videos: System Development and Empirical Studies with TikTok Dance Challenges. *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems*, 1–19. https://doi.org/10.1145/3706598.3714062

Blanchet, J., **Hillis, M. E.**, Lee, Y., Shao, Q., Zhou, X., Kraemer, D. J. M., & Balkcom, D. (2023). LearnThatDance: Augmenting TikTok Dance Challenge Videos with an Interactive Practice Support System Powered by Automatically Generated Lesson Plans. *Adjunct Proceedings of the 36th Annual ACM Symposium on User Interface Software and Technology*, 1–4. https://doi.org/10.1145/3586182.3615801

Blanchet, J., **Hillis, M.E.**, Lee, Y., Shao, Q., Zhou, X., Kraemer, D.J.M., Balkcom, D. (2023) Automatic Generation and Teaching of Dance Lessons from Video. *Proceedings of the 24th International Workshop on Mobile Computing Systems* (145-145)

Hillis, M.E., Aubrey, B., Blanchet, J., Shao, Q., Balkcom, D., Zhou, X., & Kraemer, D. J. M. (2022) Overlapping semantic representations of sign and speech in novice sign language learners. *Proceedings of the Annual Meeting of the Cognitive Science Society*. 44 (44)

Alfred, K. A., **Hillis, M. E.**, & Kraemer, D. J. M. (2020) Individual differences in the neural localization of relational networks of semantic concepts. *Journal of Cognitive Neuroscience*, 3(33), 1-12

Shao, Q., Sniffen, A., Blanchet, J., **Hillis, M.**, Shi, X., Haris, T., Liu, J., Lamberton, J., Malzkuhn, M., Quandt, L., Mahoney, J., Kraemer, D., Zhou, X., & Balkcom, D. (2020). Teaching American Sign Language In Mixed Reality. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*. 4(4), 1-27

TALKS

Cognitive Science Weekly Speaker Series, Hanover, NH May 2025
Decoding newly learned vocabulary from neural patterns in novice sign language learners

Cognitive Science Weekly Speaker Series, Hanover, NH Oct 2022
Characterizing changes in knowledge and learning with multivariate fMRI

Cognitive Neuroscience Society Data Blitz, San Francisco, CA Mar 2022
Decoding knowledge of newly-learned language from neural representations of semantic meaning

GREAT Day Symposium, Geneseo, NY May 2019
The Dorsal Visual Stream and Object Recognition: Weighing the evidence for dorsal category sensitivity

POSTERS

Hillis, M.E., Kraemer, D.J.M. (2025) Neural patterns reflect quiz performance in novice sign language learners. *Cognitive Neuroscience Society*, Boston, MA, USA.

Hillis, M.E., Shao, Q., Lee, Y., Blanchet, J., Zhou, X., Balkcom, D., & Kraemer, D.J.M. (2024) Using biosignals to predict cognitive load in an adaptive learning task. *International Mind, Brain, and Education Society*, Leuven, Belgium.

Hillis, M.E., Aubrey, B., Blanchet, J., Shao, Q., Balkcom, D., Zhou, X., & Kraemer, D. J. M. (2024). Neural decoding of semantic representations from novice sign language learners reflects newly-acquired vocabulary. *Cognitive Neuroscience Society*, Toronto, Ontario CAN.

Hillis, M.E., Aubrey, B., Blanchet, J., Shao, Q., Balkcom, D., Zhou, X., & Kraemer, D. J. M. (2023). Decoding knowledge of newly-learned language from neural representations of semantic meaning. *Cognitive Neuroscience Society*, San Francisco, CA, USA.

Hillis, M.E., Aubrey, B., Blanchet, J., Shao, Q., Balkcom, D., Zhou, X., & Kraemer, D. J. M. (2022) Overlapping semantic representations of sign and speech in novice sign language learners. *Cognitive Science Society*, Toronto, Ontario CAN

Hillis, M.E., Aubrey, B., Blanchet, J., Shao, Q., Balkcom, D., Zhou, X., & Kraemer, D. J. M. (2022). Sign and speech share semantic representation in novice sign language learners. *International Mind, Brain, and Education Society*, Montreal, Quebec CAN

Alfred, K., **Hillis, M.E.**, & Kraemer, D. (2020) Individual Differences in Patterns of Semantic Distance. *Society for the Neuroscience of Creativity*, Boston MA, USA

Mounts, J., Edwards, A., Matyasovszky, G., **Hillis, M.E.** & Nguyen, A. (2017) *The Effects of Endogenous Attention on Spatial and Temporal Processing*. GREAT Day Symposium, Geneseo NY, USA

TEACHING

Dartmouth College – Sole Instructor
- Modeling Mind and Behavior (COGS 50.08) Anticipated Fall 2025

Dartmouth College Teaching Apprenticeships and Lectures
- Major Seminar in Cognitive Science (Guest Lecturer) Fall 2022, Spring 2025

- Principles of Human Brain Mapping with fMRI (TA, Lab Instructor) Spring 2022
- Introduction to Neuroscience (TA, Guest Lecturer) Fall 2021
- Laboratory in Psychological Science (TA, Guest Lecturer, Lab Instructor) Summer 2020 & 2021

Girl Scouts of Northeastern New York

- Nature Education Specialist (designed & led STEM programs for scouts aged 5-18) Summer 2019

PROFESSIONAL ACTIVITIES AND SERVICE

Workshops and Trainings Attended

- Methods In Neuroscience at Dartmouth (MIND) Summer School Aug 2023
- Cognitive Science Preconference: Deep Learning for Brain Encoding and Decoding Jul 2022
- DCAL Future Faculty Teaching Series (8-week workshop) Jan-Mar 2021
- Software Carpentry Workshop in Python and Git Dec 2019

Dartmouth College Service

- Graduate Research Roundtable (Co-organizer) 2021-22
- Psychological and Brain Sciences Social Committee (Volunteer) Ad Hoc, 2021-25
- PBS Dept. Graduate Peer Mentor 2021-23
- PBS Dept. Working Group Advisory Committee (Member) 2021

AWARDS & SOCIETIES

Edward Curry Scholarly Achievement Award Awarded 2019
Edgar Fellows – Geneseo Merit Scholars Inducted 2016
Phi Eta Sigma – First Year Honor Society Inducted 2016
Phi Beta Kappa – Honor Society Inducted 2019
Psi Chi – Psychology Honor Society Inducted 2019

SKILLS

Programming & Analysis:	Python (7 years' experience) R (3 years' experience) fMRI analysis tools including AFNI, FSL, fMRIprep, FreeSurfer
Languages:	English (native) German (C1 Effective Operational Proficiency)
Other:	OpenBCI mobile biosensing devices Experimental design and implementation with PsychoPy, Qualtrics, Google Office Tools (including Google Apps scripting), Amazon Mechanical Turk Adobe Photoshop