

Adam Steel

CURRICULUM VITAE

Department of Psychology
University of Illinois Urbana-Champaign
Champaign, IL 61820

Appointments

January 2025 Assistant Professor, Psychology, *University of Illinois Urbana-Champaign*
Neuroscience Program, *University of Illinois Urbana-Champaign*
Beckman Institute, *University of Illinois Urbana-Champaign*
IMMERSE, *University of Illinois Urbana-Champaign*

Education

2019-2024 Post-doctoral Fellow, *Dartmouth College*
Advised by: Dr. Caroline Robertson

2014-2019 D. Phil in Biomedical Sciences, *University of Oxford*
Advised by: Dr. Chris I. Baker, *NIH*
Prof. Charlotte J. Stagg, *University of Oxford*

2012-2014 Post-Baccalaureate Fellow, *NIH*
Advised by: Eric Wassermann

2008-2012 BA, Honors in Neuroscience; English composition, *Vassar College*

Fellowships/Grants/Awards

2026-2028 BBRF Young Investigator Award (\$70,000), *Brain and Behavior Foundation*

2025-2026 UIUC-University of Birmingham BRIDGE Seed Grant (\$8,000), *University of Illinois*

2025 7T Seed Grant (\$25,000), *Beckman Institute for Advanced Science and Technology*

2024 Post-doctoral Fellow Award, *Cognitive Neuroscience Society*

2023-2024 Neukom CompX Grant (\$25,000), *Neukom Institute for Computational Science*

2021-2024 Fellow, Neukom Institute for Computational Science (\$205,000), *Dartmouth College*

2020 VSS Travel Award (fulfilled remotely), *Vision Science Society*

2017 Innovation Award, *International Biomedical Research Alliance*

2017 Graduate Research Award, *Lincoln College (Oxford)*

2014-2019 NIH-Oxford/Cambridge Scholar, *National Institutes of Health*

2012-2014 NIH Post-baccalaureate IRTA Fellowship, *National Institutes of Health*

Publications

Preprint publications (* indicates equal contribution)

Adam Steel*, Peter A. Angeli*, Caroline E. Robertson (2024). Retinotopic coding organizes the opponent dynamic between internally and externally oriented brain networks. *bioRxiv*. DOI: <https://doi.org/10.1101/2024.09.25.615084>

Peter A. Angeli*, **Adam Steel***, Caroline E. Robertson (2024). Positive and Negative Retinotopic Codes in the Human Hippocampus. *bioRxiv*. DOI: <https://doi.org/10.1101/2024.09.27.615397>

Peer-reviewed publications (* indicates equal contribution)

- Adam Steel**, Deepsari Prasad, Brenda D. Garcia, Caroline E. Robertson (2025). Relating scene memory and perception activity to functional properties, networks, and landmarks of posterior cerebral cortex - a probabilistic atlas. *Journal of Neuroscience*. DOI: <https://doi.org/10.1523/JNEUROSCI.0028-25.2025>
- Anna Mynick, **Adam Steel**, Adithi Jayaraman, Thomas L. Botch, Allie Burrows, & Caroline E. Robertson (2025). Memory-based predictions prime perceptual judgments across head turns in immersive, real-world scenes. *Current Biology*, 35(1), 121-130.e6. <https://doi.org/10.1016/j.cub.2024.11.024>
- Adam Steel***, Edward H. Silson*, Brenda D. Garcia, Caroline E. Robertson (2024). A retinotopic code structures perception and memory interactions. *Nature Neuroscience*. DOI: <https://doi.org/10.1038/s41593-023-01512-3>
- Adam Steel**, Brenda D. Garcia, Kala Goyal, Anna Mynick, Caroline E. Robertson (2023). Scene perception and visuospatial memory converge at the anterior edge of visually responsive cortex. *The Journal of Neuroscience*. 43(31): 5723-5737 DOI: <https://doi.org/10.1523/JNEUROSCI.2043-22.2023>
- Anna Mynick, **Adam Steel** (2023). Dissociating Hippocampal and Cortical Contributions to Predictive Processing. *The Journal of Neuroscience*. 43(2): 184-186 DOI: <https://doi.org/10.1523/JNEUROSCI.1840-22.2022>
- Adam Steel**, Brenda D. Garcia, Edward H. Silson, Caroline E. Robertson (2022). Evaluating the efficacy of multi-echo ICA denoising on model-based fMRI. *NeuroImage*. 264: 119723 DOI: <https://doi.org/10.1016/j.neuroimage.2022.119723>
- Adam Steel**, Madeleine M. Billings, Edward H. Silson, Caroline E. Robertson (2021). A network linking scene perception and spatial memory systems in posterior cerebral cortex. *Nature Communications*. 12:2632. DOI: <https://doi.org/10.1038/s41467-021-22848-z>
- Adam Steel**, Caroline Robertson, Jeff Taube (2020). Current promises and limitations of combined virtual reality and functional magnetic resonance imaging research in humans: A commentary on Huffman and Ekstrom (2019). *Journal of Cognitive Neuroscience*. DOI: https://doi.org/10.1162/jocn_a_01635
- Adam Steel**, Mark Mikkelsen, Richard A. E. Edden, Caroline E. Robertson (2020). Regional Balance between glutamate+glutamine and GABA+ in the resting human brain. *NeuroImage*. 220: 117112. DOI: <https://doi.org/10.1016/j.neuroimage.2020.117112>
- Adam Steel**, Chris I. Baker, Charlotte J. Stagg (2020). Intention to learn modulates the impact of reward and punishment on sequence learning. *Scientific Reports*. 10:8906. DOI: <https://doi.org/10.1038/s41598-020-65853-w>
- Edward H. Silson*, **Adam Steel***, Alexis Kidder, Adrian W. Gilmore, Chris I. Baker (2019). Distinct subdivisions of human medial parietal cortex are recruited differentially for memory recall of people and places. *eLife*. 8:e47391. DOI: <https://doi.org/10.7554/eLife.47391>

- Marcie King, Iris Groen, **Adam Steel**, Dwight Kravitz, Chris I. Baker (2019). Similarity judgments and cortical visual responses reflect different properties of object and scene categories in naturalistic images. *NeuroImage*. 197:368-382. DOI: <https://doi.org/10.1016/j.neuroimage.2019.04.079>
- Tim P. Lawrence, **Adam Steel**, Martynn Ezra, Mhairi Speirs, Pieter Pretorius, Gwenaëlle Douaud, Stamatios Sotiropoulos, Thomas Cadoux-Hudson, Uzay E. Emir, Natalie L. Voets (2019). MRS and DTI evidence of progressive posterior cingulate cortex and corpus callosum injury in the hyper acute phase after TBI. *Brain Injury*. DOI: <https://doi.org/10.1080/02699052.2019.1584332>.
- Adam Steel**, Edward H. Silson, Charlotte J. Stagg, Chris I. Baker. Differential impact of reward and punishment on functional connectivity after skill learning (2019). *Neuroimage*. 189:95-105. DOI: <https://doi.org/10.1016/j.neuroimage.2019.01.009>
- Adam Steel***, Cibu Thomas*, Aaron Trefler, Gang Chen, Chris I. Baker. Finding the baby in the bath water - evidence for task-specific changes in resting state functional connectivity evoked by training (2019). *Neuroimage*. 118:524-538. DOI: <https://doi.org/10.1016/j.neuroimage.2018.12.038>
- Edward H. Silson*, Adrian W. Gilmore*, Sarah E. Kalinowski, **Adam Steel**, Alexis Kidder, Alex Martin, and Chris I. Baker (2018). A posterior-anterior distinction between scene perception and scene construction in human medial parietal cortex. *The Journal of Neuroscience*, 1219-18; DOI: <https://doi.org/10.1523/JNEUROSCI.1219-18.2018>.
- Adam Steel**, Mark Chiew, Peter Jezzard, Natalie Voets, M. Albert Thomas, Charlotte Stagg, and Uzay E. Emir (2018). New metabolite cycled density-weighted concentric rings k-space trajectory (DW-CRT) enables 1H magnetic resonance spectroscopic imaging at 3 Tesla. *Scientific Reports*. 8:7792. DOI: 10.1038/s41598-018-26096-y
- Adam Steel**, Cibu Thomas, Chris I. Baker (2018). Effect of time of day on reward circuitry. A discussion of Byrne et al. 2017. *arXiv*. arXiv:1802.00753 [q-bio.NC]. <http://arxiv.org/abs/1802.00753>
- Mark Chiew, Wenwen Jiang, Brian Burns, Peder Larson, **Adam Steel**, Peter Jezzard, M. Albert Thomas, and Uzay E. Emir (2017). Density-Weighted Concentric Rings K-Space Trajectory for 1H Magnetic Resonance Spectroscopic Imaging at 7 Tesla. *NMR in Biomedicine*. 2018:31:e3838. DOI: 10.1002/nbm.3838
- Leonora Wilkinson, Phillip J. Koshy, **Adam Steel**, Devin Bageac, Selene Schintu, Eric M. Wassermann (2017). Motor cortex inhibition by TMS impairs cognitive non-motor procedural learning when immediate feedback is present. *Cortex*, 11/2017; 97. DOI: 10.1016/j.cortex.2017.10.001.
- Adam Steel**, Edward H. Silson, Charlotte J. Stagg, Chris I. Baker (2016). The impact of reward and punishment on skill learning depends on task demands. *Scientific Reports*. 6:36056. DOI: 10.1038/srep36056.
- Edward H. Silson, **Adam D. Steel**, & Chris I. Baker (2016). Scene-Selectivity and Retinotopy in Medial Parietal Cortex. *Frontiers in Human Neuroscience*. 10(412). DOI: 10.3389/fnhum.2016.00412

Adam Steel, Sunbin Song, Devin Bageac, Kristine M. Knutson, Ziad S. Saad, Stephen J. Gotts, Eric M. Wassermann, Leonora Wilkinson (2015). Shifts in connectivity during procedural learning after motor cortex stimulation: A combined transcranial magnetic stimulation/functional magnetic resonance imaging study. *Cortex*. 74. DOI:10.1016/j.cortex.2015.10.004

Sunbin Song, Lúcia Garrido, Zoltan Nagy, Siawoosh Mohammadi, **Adam Steel**, Jon Driver, Ray J Dolan, Bradley Duchaine, Nicholas Furl (2015). Local but not long-range microstructural differences of the ventral temporal cortex in developmental prosopagnosia. *Neuropsychologia*. 78. DOI:10.1016/j.neuropsychologia.2015.10.010

Leonora Wilkinson, **Adam Steel**, Eric Mooshagian, Trelawny Zimmermann, Aysha Keisler, Jeffrey D Lewis, Eric M Wassermann (2015). Online feedback enhances early consolidation of motor sequence learning and reverses recall deficit from transcranial stimulation of motor cortex. *Cortex*. 7. DOI:10.1016/j.cortex.2015.06.012

Book Chapters

Adam Steel, Edward H. Silson (2022). Visual category-driven differences in memory. Ed: W. A. Bainbridge, T. F. Brady. *Visual memory*. Oxford, England: Routledge

Mentorship

2022-2023	Women in Science Program Supervisor (Nandhini Parthasarathy), <i>Dartmouth</i>
2022	Neukom Scholar supervisor (Kenna van Steyn), <i>Dartmouth</i>
2020-2021	Thesis advisor (Brenda Garcia; Best thesis award), <i>Dartmouth</i>
2019	Postdoctoral mentor (Madeleine Billings), <i>Dartmouth</i>
2017-2018	FHS (Thesis) Supervisor (Georgina James, St. Edmunds Hall), <i>Oxford</i>
2014	Summer internship Mentor (Caitlyn van Wicklin), <i>National Institutes of Health</i>
2013	Summer internship Mentor (Caitlyn van Wicklin), <i>National Institutes of Health</i>
2012	Summer internship Mentor (Angad Uppal), <i>National Institutes of Health</i>

Teaching

Fall 2025	Psych 403: "Memory and Amnesia", <i>University of Illinois Urbana-Champaign</i>
Spring 2025	Psych 220: "Images of Mind", <i>University of Illinois Urbana-Champaign</i>
2020-2023	Lecturer, PBS 81.11: "Real-world scene perception", <i>Dartmouth College</i>
2016	Tutor, FSL short course: "Neuroimaging methods and analysis", <i>University of Oxford</i>

Educational training

2020	Syllabus Design Workshop, <i>Dartmouth Center for Advancement of Learning (DCAL)</i>
2020	Future Faculty Teaching Workshop (Student-centered approaches), <i>DCAL</i>

Editorial positions

2020-current Reviewing editor, *Frontiers in Human Neuroscience*

Journal Reviewer

Neuron, Nature Communications, Current Biology, eLife, NeuroImage, Cerebral Cortex, Imaging Neuroscience, PLOS Computational Biology, Human Brain Mapping, Journal of Neurophysiology, Scientific Reports, Journal of Cognitive Neuroscience, Cerebral Cortex Communications, PLOS One,

Brain Stimulation, BMC Neuroscience, Experimental Brain Research, Experimental Brain and Behavior, Brain and Behavioral Research, Neuromodulation, Neurocase

Leadership/Outreach

2020-2023 Co-Founder, *Innovators in Cognitive Neuroscience*, <https://innovatorsincogneuro.github.io>
 2019-2022 Organizer, *Dartmouth Brain Imaging Center FMRI Brown Bag Seminar Series*
 2020-2022 Volunteer, *Skype-A-Scientist*
 2020 Moderator, *Neuromatch 2020 2.0*
 2016-2017 MCR (Graduate student association) Secretary, *Lincoln College (Oxford)*
 2009-2010 Student Fellow, *Vassar College*

Media interviews/appearances

Feb. 2022 “New map of meaning in the brain changes ideas about memory.” *Quanta magazine*.
<https://www.quantamagazine.org/new-map-of-meaning-in-the-brain-changes-ideas-about-memory-20220208/>
 Dec. 2022 “How the brain distinguishes perceptions from memories.” *Quanta magazine*.
<https://www.quantamagazine.org/how-the-brain-distinguishes-memories-from-perceptions-20221214/>

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Presentation Sessions

Invited talks

February 2026	University of Michigan (John Jonides)
October 2025	Purdue University (Darryl Schneider)
August 2025	Johns Hopkins University (Fred Barrett)
June 2025	University College London (Nadine Dijkstra)
May 2025	Northwestern University (Rodrigo Braga)
April 2025	UIUC Undergraduate Neuroscience Club (Nadia Laplanche)
April 2025	University of British Columbia, Canada (Daniela Palombo)
February 2025	McGill University (Nathan Spreng)
January 2024	NYU (Biyu He)
May 2023	BIU Vision Science Series (Sharon Gilaie-Dotan)
September 2022	University College London (Hugo Spiers)
November 2021	University of Chicago (Wilma Bainbridge)
January 2021	UC Davis (Charan Ranganath)
March 2020	MIT (Nancy Kanwisher)
April 2018	Dartmouth College (Caroline E. Robertson)
April 2018	University of Pennsylvania (Danielle Bassett)
April 2018	Columbia University (Daphna Shohamy)
March 2018	Johns Hopkins University (Marina Bedny)
June 2017	University of Pittsburgh (Vishnu Murty)
February 2017	University of East Anglia (George Malcolm)
December 2016	University of Birmingham (Joseph Galea)

Conference presentations

Steel, A. (December 2025). Orchestrating cognition: Linking Voxel-Scale Neural Coding to Global Network Dynamics. University of Illinois-University of Birmingham Symposium on Network Neuroscience. Birmingham, UK

Steel, A. (April 2025). Retinotopic coding is a ubiquitous scaffold for perceptual and mnemonic interactions in the human brain. Symposium. Cognitive Neuroscience Society Annual meeting. Boston, Massachusetts.

Steel, A. (November 2024). Retinotopically-specific, top-down activity structures perception and memory cortical interactions in the resting brain. Nanosymposium. Society for Neuroscience annual meeting. Chicago, Illinois.

Steel, A. (May 2023). *A retinotopic reference frame structures perception-memory interactions*. Talk. Vision Science Society Meeting. St. Petes Beach, Florida.

Steel, A. (May 2020). The place memory network: an interface between spatial memory and scene perception. *Neuromatch 2020 2.0*. Short talk. Video presentation: <https://youtu.be/nsXHrDDrJkw?t=15230>

Steel, A., Billings, M. M., Robertson, C. E. (May 2020). *The place memory network: A network of brain areas supporting perception and memory of familiar places*. V-VSS.

Steel, A., Robertson, C. E. (November 2019). *Balance of excitation and inhibition in the human brain*. International Symposium on GABA and Advanced MRS. Symposium presentation. Salt Lake City, Utah.

Steel, A., Wilkinson, L., Mooshagian, E., Zimmermann, T., Keisler, A., Lewis, J.D., Wassermann, E.M (November 2014). *Reduction of primary motor cortex cTBS excitability predicts benefit of feedback for retention of sequence learning*. Nanosymposium presentation. Society for Neuroscience meeting in Washington, DC.

Poster sessions

Steel, A., Tang, N., Panek., D, Scrivener, C., Silson, E. H. (November 2025). Bifurcation of scene perception and memory processes in superior parietal cortex. Society for Neuroscience Annual Meeting. San Diego, CA

Steel, A., Prasad, D., Garcia, B. D., Robertson, C. E. (May 2025). Topography of scene memory and perception activity in posterior cortex – a publicly available resource. Vision Science Society Meeting. St. Pete's Beach, Florida.

Steel., A., Angeli, P., Silson, E.H., Robertson., C. E. (May 2024). *Inverted visual coding across category-selective visual areas*. Vision Science Society Meeting. St. Pete's Beach, Florida.

Steel., A., Angeli, P., Silson, E.H., Robertson., C. E. (March 2024). *Inverted visual coding across category-selective visual areas*. Cognitive Neuroscience Society Meeting. Toronto, Canada

- Steel, A., Silson, E. H., Garcia, B. D., Robertson, C. E. (November 2023). *Inverted visual coding at the cortical apex in neurotypical and autistic people*. Society for Neuroscience Annual Meeting. Poster. Washington, DC
- Steel, A., Silson, E. H., Garcia, B. D., Robertson, C. E. (August 2023). *A retinotopic reference frame structures perception-memory interactions*. Cognitive Computational Neuroscience. Poster. Oxford, United Kingdom
- Steel, A., Silson, E. H., Garcia, B. D., Robertson, C. E. (March 2023). *A retinotopic reference frame structures perceptual-mnemonic interactions*. Poster presentation. Cognitive Neuroscience Society Meeting. San Francisco, CA.
- Steel, A., Silson, E. H., Garcia, B. D., Robertson, C. E. (November 2022). *A retinotopic reference frame structures perceptual-mnemonic interactions*. Poster presentation. Society for Neuroscience Annual Meeting. San Diego, CA.
- Steel, A., Garcia, B. D., Mynick, A., Goyal K., Robertson, C. E. (April 2022). *Representation of visuospatial context in posterior cerebral cortex*. Poster presentation. Cognitive Neuroscience Society Meeting. San Francisco, CA.
- Steel, A., Billings, M. M., Robertson, C. E. (May 2020). *Distinct neural substrates for scene perception and imagery*. *Cognitive Neuroscience Society Annual Meeting*. Virtual poster. [Video presentation: https://www.youtube.com/watch?v=e-v7w5vzntQ](https://www.youtube.com/watch?v=e-v7w5vzntQ)
- Steel, A., Silson, E., Kidder, A., Gilmore, A. W., Baker, C. I. (May 2019). *Recall of people and places reveals regions showing distinct effects of category and familiarity in high-level cortex*. Poster presentation. Visual Science Society Annual Meeting.
- Steel, A., Silson, E., Baker, C. I. (November 2018). *Distinct subdivisions in medial parietal cortex revealed by functional connectivity with category-selective ventral temporal cortex*. Poster presentation. Meeting of the Society for Neuroscience. San Diego, CA.
- Steel A., Chiew, M., Jezard, P., Voets, N., Thomas, M. A., Stagg, C. J. , Emir, U. E.. (June 2018). *New metabolite cycled density-weighted concentric rings k-space trajectory (DW-CRT) enables 1H magnetic resonance spectroscopic imaging at 3 Tesla in a clinically feasible timeframe*. Poster presentation. ISMRM. Paris, France.
- Steel, A., James, G., Chiew, M., Thomas, M. A., Emir, U. E., Stagg, C. J. (June 2018). *Regional GABA levels assessed by magnetic resonance spectroscopic imaging predict motor behaviors*. Poster presentation. Organization for Human Brain Mapping. Singapore, Singapore.
- Steel, A., Silson, E. H., Baker, C. I. (May 2018). *Functional connectivity to ventral temporal cortex reveals category selectivity in medial parietal areas*. Poster presentation. Visual Sciences Society Meeting. St. Pete's Beach, FL.
- Steel, A., Silson, E., Stagg, C. J., Baker, C. I. (April 2018). *Intentionality modulates the impact of reward and punishment on performance during sequence learning*. Poster presentation. Cognitive Neuroscience Society Meeting. Boston, MA.

- Steel, A., Silson, E., Stagg, C. J., Baker, C. I. (June 2017). *Opposing effects of reward and punishment on motor skill learning*. Poster presentation. Organization for Human Brain Mapping meeting in Vancouver, British Columbia, Canada.
- Steel, A., Silson, E., Stagg, C. J., Baker, C. I. (May 2017). *Reward and punishment differentially recruit cerebellum and hippocampus to support skill stabilization*. Poster presentation. Conference of the Neural Control of Movement. Dublin, Ireland.
- Steel, A., Silson, E., Stagg, C. J., Baker, C. I. (April 2017). *Opposing effects of reward and punishment on motor skill learning*. Poster presentation. British Neuroscience Association Festival of Neuroscience, Birmingham, UK.
- Steel, A., Silson, E., Stagg, C. J., Baker, C. I. (April 2017). *Reward and punishment differentially recruit cerebellum and hippocampus to support skill stabilization*. Poster presentation. Thomas Willis Day, University of Oxford, Oxford, UK.
- Steel, A., Thomas, C., Gang, C., Trefler, A., Baker, C. I. (March 2017). *Measuring the impact of short term training on brain networks using resting-state connectivity*. Poster presentation. Cognitive Neuroscience Society Meeting in San Francisco, California.
- Steel, A., Silson, E., Stagg, C. J., Baker, C. I. (November 2016). *Impact of reward and punishment on the neural correlates of sequence learning*. Poster presentation. Meeting of the Society for Neuroscience in San Diego, California.
- Steel, A., Silson, E., Stagg, C. J., Baker, C. I. (June 2016). *Impact of reward and punishment on motor skill learning*. Poster presentation. Organization for Human Brain Mapping meeting in Geneva, Switzerland.
- Steel, A., Silson, E., Stagg, C. J., Baker, C. I. (June 2016). *Impact of reward and punishment on motor skill learning*. Poster presentation. NIH OxCam colloquium in Cambridge, UK.
- Steel, A., Silson, E., Stagg, C. J., Baker, C. I. (April 2016). *Dissociating the impact of reward and punishment on performance and retention of skilled behaviors*. Poster presentation. Cognitive Neuroscience Society Annual Meeting in New York, NY.
- Steel, A., Silson, E., Stagg, C. J., Baker, C. I. (November 2015). *Impact of feedback valence during skill learning on dynamic and static functional connectivity*. Poster presentation. Society for Neuroscience meeting in Chicago, IL.
- Steel, A., Silson, E., Stagg, C. J., Baker, C. I. (June 2015). *Feedback improves sequence performance and decreases global connectivity after learning*. Poster presentation. NIH OxCam colloquium in Cambridge, UK.
- Steel, A., Silson, E., Stagg, C. J., Baker, C. I. (June 2015). *Feedback improves sequence performance and decreases global connectivity after learning*. Poster presentation. Organization for Human Brain Mapping meeting in Honolulu, HI.

Bell, A., Steel, A. (May 2012). *Cabin Fever: Effects of group housing on stress induced frustration*.
Mid-Hudson Valley Life Sciences Conference, New Paltz, NY.

Extra curricular activities and interests

Marathon and ultra marathon running 2013-present

Lincoln College Boat Club, University of Oxford 2015-May 2018

Vassar College Rugby 2008-2012