ELIZABETH S. LORENC, PHD

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EDUCATION

University of California, Berkeley Helen Wills Neuroscience Institute — Berkeley, CA
PhD, Neuroscience — May 2018
Pre-Doctoral National Research Service Award, National Institute of Mental Health
National Science Foundation Graduate Research Fellowship Honorable Mention

Mount Holyoke College, — S Hadley, MA
BA, *summa cum laude*, Neuroscience and Behavior. GPA: 3.99/4.0 — May 2010
Sarah Williston Prize, 2008 – 2010
Bernice MacLean Award for Excellence in Biology, 2010
Mount Holyoke Leadership Award, 2006 – 2010

RESEARCH EXPERIENCE

Brown University — Providence, RI
Staff Scientist, Behavior & Neuroimaging Core, Neuroscience Dept. — 2022 – present

University of Texas, Austin — Austin, TX
Lewis-Peacock Lab Postdoctoral Research Fellow — 2018 – 2022
Used EEG to track moment-to-moment fluctuations in the strength of working memory representations and identify memory states that are particularly vulnerable to distraction. Employed fMRI neurofeedback [applying multivoxel pattern classifiers to real-time functional neuroimaging data] to manipulate the level of competition between items in working memory and modulate long-term retention/forgetting.

University of California, Berkeley — Berkeley, CA
D'Esposito Lab Graduate Student Researcher — 2012 – 2018
Used fMRI inverted encoding models and multivoxel pattern classification analyses to characterize working memory representations for complex images like human faces and investigate the effect of visual distractors on working memory representations.

Vanderbilt University — Nashville, TN
Tong Lab Research Analyst — 2010 – 2012
Independently designed, conducted, and analyzed a set of behavioral experiments demonstrating that face inversion selectively impairs visual working memory precision, not capacity.

Mount Holyoke College — S Hadley, MA
Neuroscience and Behavior Honors Thesis — 2009 – 2010
Investigated the involvement of the dorsal and ventral streams of visual perception in precision grasping and susceptibility to visual illusions, advised by Dr. Joseph Cohen.

Massachusetts Institute of Technology — Cambridge, MA
MIT Summer Research Program (MSRP) Intern — Summer 2009
Worked in the Gabrieli Lab in the Brain and Cognitive Sciences Department on an fMRI investigation of the neural development of source memory from age eight to adulthood.

Rensselaer Polytechnic Institute Cognitive Science Department — Troy, NY
Summer Researcher — Summer 2008

Worked with Dr. Mark Changizi on data collection and shaping of the theory that language has evolved to mimic the sound patterns of natural events, now published in his book Harnessed.

PUBLICATIONS

Mallett, R., **Lorenc, E. S.** & Lewis-Peacock, J. A. (2022). Working Memory Swap Errors Have Identifiable Neural Representations. *Journal of Cognitive Neuroscience*. Advance online publication. https://doi.org/10.1162/jocn_a_01831

Lu, H. Y., **Lorenc, E. S.**, Zhu, H., Kilmarx, J., Sulzer, J., Xie, C., Tobler, P. N., Watrous, A. J., Orsborn, A. L., Lewis-Peacock, J. A. & Santacruz, S. R. (2021). Multi-scale neural decoding and analysis. *Journal of Neural Engineering*, *18*(4), 045013. https://doi.org/10.1088/1741-2552/ac160f

Lorenc, E. S.*, & Sreenivasan, K. K.* (2021). Reframing the debate: The distributed systems view of working memory. *Visual Cognition*, 1-9. https://doi.org/10.1080/13506285.2021.1899091 *equal contributions

Lorenc, E. S., Mallett, R., & Lewis-Peacock, J. A. (2021). Distraction in Visual Working Memory: Resistance is Not Futile. *Trends in Cognitive Sciences*, *25*(3), 228–239. https://doi.org/10.1016/j.tics.2020.12.004

Lorenc, E. S.*, Vandenbroucke, A. R. E.*, Nee, D. E., de Lange, F. P., & D'Esposito, M. (2020) Dissociable neural mechanisms underlie currently-relevant, future-relevant, and discarded working memory representations. *Scientific Reports, 10*(1), 1-17. https://doi.org/10.1038/s41598-020-67634-x *co-first authors

Lorenc, E. S., Sreenivasan, K. K., Nee, D. E., Vandenbroucke, A. R. E., & D'Esposito, M. (2018). Flexible coding of visual working memory representations during distraction. *Journal of Neuroscience, 38*(23): 5267-5276. https://doi.org/10.1523/JNEUROSCI.3061-17.2018

Lorenc, E. S., Lee, T. G., Chen, A. J.-W., & D'Esposito, M. (2015). The effect of disruption of prefrontal cortical function with transcranial magnetic stimulation on visual working memory. *Frontiers in Systems Neuroscience,* 9:169. https://doi.org/10.3389/fnsys.2015.00169

Lorenc, E. S., Pratte, M. S., Angeloni, C. F., & Tong, F. (2014). Expertise for upright faces improves the precision but not the capacity of visual working memory. *Attention, Perception, & Psychophysics, 76*(7), 1975-1984. https://doi.org/10.3758/s13414-014-0653-z

Counterman, E. (2010, May). Influences of awkwardness and eccentric fixation on visuomotor susceptibility to pictorial illusions. Honors thesis and defense to the Mt Holyoke College Psychology Department, South Hadley, MA. URI: http://hdl.handle.net/10166/732

INVITED TALKS

"Shaping visual memories with real-time fMRI neurofeedback" (2023, February). Psychology Graduate Program, Mississippi State University. Starkville, MS.

"Dissociable neural mechanisms underlie currently-relevant, future-relevant, and discarded working memory representations". (2020, October). Collins Lab, Department of Psychology, UC Berkeley. Berkeley, CA.

PRESENTATIONS

Sanes, J.N., Worden, M.S., McEleney, F., Gonsalves, M.A., **Lorenc, E.S.**, Berson, D.M., Carpenter, L.L. (2023, September). Depressive disorders reduce light-induced responses in human prefrontal cortex. Poster presented at the International Brain Research Organization World Congress of Neuroscience, Granada, Spain.

Worden, M.S., McEleney, F., Gonsalves, M.A., **Lorenc, E.S.,** Berson, D.M., Carpenter, L.L., Sanes, J.N. (2022, November). Seasonal affective disorder and major depressive disorder reduce light-induced responses in human prefrontal cortex. Poster presented at the Society for Neuroscience Annual Meeting, San Diego, CA.

Lorenc, E. S., Bruning, A.L., Lewis-Peacock, J.A. (2021, September). Manipulating attention in working memory to shape long-term retention. Talk presented at the Dallas and Austin Area Memory Meeting, Austin, TX.

Lorenc, E. S., Oblak, E., Sulzer, J., Lewis-Peacock, J. (2019, October). Shaping visual memories with real-time fMRI neurofeedback. Poster presented at the Society for Neuroscience Annual Meeting, Chicago, IL.

Lorenc, E. S., D'Esposito, M. (2018, November). Respective roles of frontoparietal and stimulus-selective visual regions in visual working memory for complex objects. Talk presented at the Society for Neuroscience Annual Meeting, San Diego, CA.

Lorenc, E.S., Mallett, R., Lewis-Peacock, J.A. (2018, September). Mechanisms of visual working memory for complex stimuli. Talk presented at the annual Dallas and Austin Area Memory Meeting, Waco, TX.

Lorenc, E. S., D'Esposito, M. (2018, March). Neural mechanisms of precision in visual working memory. Poster presented at the Cognitive Neuroscience Society Annual Meeting, Boston, MA.

Lorenc, E. S., D'Esposito, M. (2017, May). Neural mechanisms of precision in visual working memory for faces. Poster presented at the Vision Sciences Society Annual Meeting, FL.

Nee, D. E., Vandenbroucke, A. R. E., **Lorenc, E. S.**, D'Esposito, M. (2016, November). Forward modeling in fMRI: efficacy and limits. Presenting author of poster at the Society for Neuroscience Annual Meeting, San Diego, CA.

Lorenc, E. S., Sreenivasan, K. K., Nee, D.E., Vandenbroucke, A. R. E., D'Esposito, M. (2016, May). Effects of distractors on visual working memory representations. Poster presented at the Vision Sciences Society Annual Meeting, St Pete's Beach, FL.

Lorenc, E. S., Sreenivasan, K. K., Nee, D. E., Vandenbroucke, A. R. E., D'Esposito, M. (2015, October). Distractor resistance for precise visual working memory. Poster presented at the Society for Neuroscience Annual Meeting, Chicago, IL.

Vandenbroucke, A. R. E., **Lorenc, E. S.**, Nee, D. E., de Lange, F. P., D'Esposito, M. (2015, October). The neural correlates of unattended working memory representations. Poster presented at the Society for Neuroscience Annual Meeting, Chicago, IL.

Lorenc, E. S., Lee, T. G., Chen, A., D'Esposito, M. (2015, September). Disruption of prefrontal cortical function with TMS disrupts goal-directed visual processing. Poster presented at the University of California, Berkeley Annual Neuroscience Conference, Tahoe, CA.

Lorenc, E. S., Lee, T. G., Chen, A., D'Esposito, M. (2015, June). Disruption of prefrontal cortical function with TMS disrupts goal-directed visual processing. Poster presented at the Organization for Human Brain Mapping Meeting, Honolulu, HI.

Counterman, E., & Tong, F. (2012, May). Face inversion impairs precision, but not capacity, of visual working memory. Poster presented at the 2012 Vision Sciences Society meeting, Naples, FL.

Counterman, E. (2010, April). Influences of awkwardness and eccentric fixation on visuomotor susceptibility to pictorial illusions. Talk presented at Senior Symposium, Mount Holyoke College, South Hadley, MA.

Counterman, E., Ofen, N., Chai, X., Gabrieli, J. (2009, August). An Investigation of the Neural Development of Source Memory from Childhood to Adulthood. Poster presented at the Massachusetts Institute of Technology MSRP Poster Session, Cambridge, MA.

TEACHING & MENTORSHIP

Guest Lecturer on Working Memory for UT Austin Principles of Cognitive Neuroscience Graduate Course — 2021

Guest Lecturer on Probability for UT Austin Psychological Methods & Statistics Undergraduate Course — 2020

UT Austin Undergraduate Research Mentor — 2019 – present
Aanika D. (highschooler), Alec Fumurescu, Alexandra Epstein, Aayushi Sangani, Phillip Taboada

UC Berkeley Undergraduate Research Apprentice Program — 2015 – 2018
Paige Mumford, Josephine Tseng, Ann Lai, Andrea Liu, Sijing Ye, Rasika Sudharshan

NIH Bridges to the Baccalaureate Program — Summer 2016
Guided a local community college student through his first research experience, in preparation for his ultimate transfer to a 4-year school.

Applied Statistics for Neuroscience Co-operative Course — 2014
Revised and re-organized course materials after the first iteration of the course

Graduate Student Instructor, Developmental Psychology, Professor Fei Xu — 2014
Presented 3 one-hour weekly lectures for 75 undergraduate students, one guest lecture for the entire 250-student class, and held weekly office hours

Graduate Student Instructor, Psychology of Sleep, Professor Matthew Walker 2013
Gave 3 one-hour lectures and one office hour per week for 75 undergraduate students

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LEADERSHIP & SCIENCE OUTREACH

Real-time Neurofeedback Journal Club 2020 – present
Lead a biweekly/monthly interdepartmental meeting at UT Austin to discuss relevant literature and share experiment proposals and research results.

Frontiers for Young Minds 2016 – present
Facilitate scientific manuscript reviews by middle- and high school students.

Dell Medical School Health Science Summer Camp summer 2019
Introduced students to human neuroscience with a "brain decoding and neurofeedback" booth, with an interactive neurofeedback demo using a low-cost Muse EEG headset.

Mind & Brain Day 2012 – 2018
About once a semester, created a daylong event at a local elementary or middle school designed to teach and excite young students about neuroscience. Recruited ~20 graduate student and post doc volunteers to run interactive neuroscience booths.

Brain Lunch 2013 – 2016
Organized a weekly seminar series for the UC Berkeley Helen Wills Neuroscience Institute, including research talks, journal clubs, and professional development panels.

Bay Area Scientists In Schools (BASIS) 2012 – 2016
Led monthly neuroscience and vision lessons in area elementary school classrooms.

Expanding your Horizons 2013 – 2014
Member of organizing committee for science conference for middle school girls at UC Berkeley.

PROFESSIONAL CONTRIBUTIONS

Ad hoc reviewer for:
Attention, Perception, & Psychophysics; Brain Sciences; Cerebral Cortex; Cognition; Cortex; Current Directions in Psychological Science; eNeuro; Frontiers for Young Minds; Journal of Cognition; Journal of Neuroscience; NeuroImage; Neuroscience; Quarterly Journal of Experimental Psychology; Scientific Reports; Trends in Cognitive Sciences; Visual Cognition

Professional memberships:
Phi Beta Kappa, Society for Neuroscience, Vision Sciences Society, Cognitive Neuroscience Society, Sigma Xi Scientific Research Society, Psi Chi National Psychology Honor Society

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