

Ian Ballard

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Academic History

University of California, Riverside Assistant Professor, Psychology Department Affiliate Member of the Neuroscience Graduate Training Program	2023 - present
University of California, San Diego Postdoctoral Researcher, Cognitive Science Department	2023 - 2023
University of California, Berkeley Postdoctoral Researcher, Helen Will Neuroscience Institute	2018 - 2023
Stanford University Ph.D., Neurosciences	2012 - 2018
Duke University B.S., Theoretical Neuroscience	2007 - 2011

Submitted Manuscripts

▲ *First, corresponding or senior author*

- Ballard I.C., Furman, D.J., Berry, A.S., White, R.L., Jagust, W.G., D'Esposito, M. A dopaminergic basis of behavioral control. **BioRxiv**. (Under Review) 2025. ▲
- Kim H., Ballard I.C, Leong, Y.C. A neurocomputational account of motivated seeing. (In Revision) 2025.
- Ballard I.C., Pappas, I., Furman, D.J., Berry, A.S., Frederick B., White, R.L., Jagust, W.G., D'Esposito, M. Temporal fMRI Dynamics Map Dopamine Physiology. **BioRxiv**. (Under Review) 2024. ▲

Publications

▲ *First, corresponding or senior author*

- Schuman, I., Wang, J., Ballard, I.C., Lapate, R.C. 2025. "Willing to Wait: Anorexia Nervosa Symptomatology Is Associated with Higher Future Orientation and Reduced Intertemporal Discounting." **Scientific Reports** 15 (1): 4508 (2025).
- Piriyajitakonkij, M., Itthipuripat, S., Ballard, I.C*. and Pappas, I*. What Makes a Face Look Like a Hat: Decoupling Low-level and High-level Visual Properties with Image Triplets. *In Press*. **Proceedings of the European Conference on Computer Vision** (2024). ▲
*Co-senior author
- Ballard, I.C., Nix, K., D'Esposito, M.D. Ballard, Ian C., Michael Waskom, Kerry C. Nix, and Mark D'Esposito. "Reward Reinforcement Creates Enduring Facilitation of Goal-Directed Behavior." **Journal of Cognitive Neuroscience**, April, 1–16 (2024). ▲

- Elliott, B., Mohyee, R., Ballard, I.C., Olson, I., Ellman, L., Murty, V.P. In Vivo Structural Connectivity of the Reward System Along the Hippocampal Long-Axis. **Hippocampus**, 34(7), 327–341 (2024).
- Lapate, R., Ballard, I.C., Heckner, M., D'Esposito, M.D. Emotional context sculpts action goal representations in the lateral frontal pole. **The Journal of Neuroscience**, 42 (8): 1529–41 (2022).
- Shen, X., Ballard, I.C., Smith, D., Murty, V.P. Decision uncertainty during hypothesis testing has distinct influences on memory accuracy and memory confidence. **Learning and Memory**. 29 (4): 93–99 (2022).
- McDougle, S.D., Ballard, I.C., Baribault, B., Bishop, S., Collins, A.D.E. Executive function assigns value to novel goal-congruent outcomes. **Cerebral Cortex**, 32 (1): 231–47 (2021).
- Radulescu, A., Niv, Y., Ballard, I.C. Holistic Reinforcement Learning: The Role of Structure and Attention. **Trends in Cognitive Sciences**, 23(4): 278–92 (2019). ▲
- Ballard, I.C., Wagner, A.D., McClure, S.M. Hippocampal Pattern Separation Supports Reinforcement Learning. **Nature Communications**, 10(1): 1073 (2019). ▲
- Ballard, I.C., McClure, S.M. Joint Modeling of Choice and Reaction Times Improves Parameter Identifiability in Reinforcement Learning Models. **Journal of Neuroscience Methods**, 317(4): 37–44 (2019). ▲
- Diehl, M., Steele, V., Lempert, L., Parr, A., Ballard, I.C., Smith, D. Toward an Integrative Perspective on the Neural Mechanisms Underlying Persistent Maladaptive Behaviors. **European Journal of Neuroscience**, 48(3): 1870–83 (2018).
- Ballard, I. C., Aydogan, G., Kim, B. & McClure, S.M. Causal Evidence for the Dependence of the Magnitude Effect on Dorsolateral Prefrontal Cortex. **Scientific Reports**, 8(1), 16545 (2018). ▲
- Ballard, I. C. Kim, B., Aydogan, G., Liatsis, A., Cohen, J.D., McClure, S.M. More Is Meaningful: The Magnitude Effect in Intertemporal Choice Depends on Self-Control. **Psychological Science**, 28(10), 1443–1454 (2017). ▲
- Ballard, I.C., Miller, E., Piantadosi, S.T., Goodman, N., McClure, S.M. Beyond Reward Prediction Errors: Human Striatum Represents Rule Values During Categorization Learning. **Cerebral Cortex**, 19(3), 1-11 (2017). ▲
- Murty, V.P*, Ballard, I.C*, Adcock, R.A. Hippocampus and Prefrontal Cortex Predict Distinct Timescales of Activation in the Human Ventral Tegmental Area. **Cerebral Cortex**, 27(2), 1660– 1669 (2017). ▲
*Co-first author
- Ballard, I.C., Hennigan, K., McClure, S.M. (2017) Mere Exposure: Preference for Novel Drinks Reflected in Human Ventral Tegmental Area. **Journal of Cognitive Neuroscience**, 29, 793–804 (2017). ▲
- Murty, V. P., Ballard, I. C., Macduffie, K. E., Krebs, R. M. & Adcock, R. A. Hippocampal networks habituate as novelty accumulates. **Learning & Memory**, 20, 229–235 (2013).
- Ballard, I.C.*, Murty, V.P.*, Carter R.M., MacInnes J.J., Huettel S.A., Adcock R.A. Dorsolateral prefrontal cortex drives mesolimbic dopaminergic regions to initiate motivated behavior. **Journal of Neuroscience**, 31(28), 10340-6. (2011). ▲

Samanez-Larkin, G.R., Mata, R., Radu, P.T., Ballard, I.C., Carstensen, L.L., McClure, S.M. Age differences in striatal delay sensitivity during intertemporal choice in healthy adults. *Frontiers in Neuroscience*, 5, 126. (2011).

Select Conference Presentations

Peixoto, D. and **Ballard, I.C.** *Attention compensates for reduced reinforcement learning in older adults*. Accepted Poster. (CNS 2025).

Shen, K., Pappas, I., Itthipuripat, S., Keerativittayayut, R., Pamarapa, C., Chunharas, C., **Ballard, I.C.** Hierarchical prefrontal contributions to perceptual decision-making Accepted Datablitz Talk. (CNS 2025).

Chang, J., **Ballard, I.C.** *Large Language Model Shows Human-Like Decision Making Biases*. Poster. MSRIIP Undergraduate Research Conference (2024)

Shin, G., **Ballard, I.C.** *Balancing Patience and Impulsivity: Artificial Intelligence Strategies for Human-like Economic Decision-Making*. Poster. R'Psych UCR Undergraduate Research Conference (2024)

Grants

NIMH F32 Postdoctoral Ruth L. Kirschstein NRSA (PI) 2020 - 2023

NSF Graduate Research Fellowship Program (PI) 2012 - 2015

Professional Activities

Invited Talks

UCSF CSRTTP Meeting (2025) • UCI Cognition Colloquium (2024) • UCSD Neuroeconomics Conference (2024) • Computational Psychiatry Seminar Mount Sinai (2023) • Brown University Shenhav Lab Meeting (2022) • UC Davis Memory Meeting (2022) • NYU Concepts and Categories Series (2022) • UCSB Cognitive Psychology Colloquium (2021) • UCLA Cognitive Psychology Forum (2021) • Memory and Context Meeting (2021) • Brown University Feldman Hall Lab Meeting (2021) • Columbia University Psychology Colloquium (2020) • Stanford University SPANLab Meeting (2020) • ASU Cognitive Brown Bag (2020)

Conference Talks

Cognitive Neuroscience Society (2025) • Brain Informatics (2024) • American Psychological Association (2024) • Cognitive Neuroscience Society Symposium (2022) • Cognitive Neuroscience Society (2020/21/23) • Cognitive Computational Neuroscience (2017) • Interdisciplinary Symposium on Decision Neuroscience (2017) • Society for Neuroeconomics Spotlight (2016) • Society for Neuroscience Nanosymposium (2015)

Conference Organization

Created, organized and led COSYNE Workshop: *Hippocampal computations and interactions supporting learning and decision-making* (2018)

Ad Hoc Reviewing

Nature Human Behavior • Nature Machine Intelligence • Psychological Review • Nature Communications • Current Biology • Cerebral Cortex • Cognition • Journal of Cognitive Neuroscience • Scientific Reports • Communications Psychology • Hippocampus • Neuroimage • Social Cognitive and Affective Neuroscience • PLOS Computational Biology • PLOS One • Brain Imaging and Behavior • Memory and Cognition • Bulletin of Mathematical Biology • Journal of Mathematical Psychology • Journal of Economic Psychology

Teaching

Advanced Topics in Cognition (UCR; <i>graduate; instructor</i>)	2025
Psychology and AI (UCR; <i>undergraduate; instructor</i>)	2024
Cognition and Cognitive Neuroscience (UCR; <i>graduate; instructor</i>)	2024
The Nervous System (Stanford; <i>medical school; teaching assistant</i>)	2014 - 2018
Learning and Memory (Stanford; <i>undergraduate; teaching assistant</i>)	2016
Developmental Psychology (Stanford; <i>undergraduate; teaching assistant</i>)	2014

Mentorship

PhD Students

Daniel Peixoto (current)

Postdoctoral Scholars

Karen Shen (current)

Lab Manager

Shannan Chen (current)

Master's Thesis Supervision

Corrina Laube. (*Now professor*) • Anna Moretti

Undergraduate Senior Thesis Supervision

Sheena Horiki

Fellowships and Awards

Kavli Summer Institute in Cognitive Neuroscience	2016
Neuroeconomics Society Summer School	2015
Stanford Mind Brain and Computation Fellowship	2013
Duke University Scholars Full Tuition Merit Scholarship	2007