

Daphna Shohamy, PhD
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Columbia University, New York
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POSITIONS

2007–2013 Assistant Professor, Columbia University, Psychology
2013–2018 Associate Professor, Columbia University, Psychology and Zuckerman Mind, Brain, Behavior Institute
2018-present Professor, Columbia University, Psychology and Zuckerman Mind, Brain, Behavior Institute

EDUCATION & TRAINING

2004–2007 Postdoctoral Research Fellow, Department of Psychology, Stanford University
1997–2003 Ph.D., Rutgers University, Center for Neuroscience; Dissertation: *The Role of the Basal Ganglia in Learning and Memory: Evidence from Parkinson's Disease*.
Advisor: Mark A. Gluck
1992–1996 B.A., Tel-Aviv University; Double major in Psychology and Humanities

AWARDS & HONORS

2019 Brenda Milner Keynote Lecture, Montreal Neurological Institute
2017 Invited Special Lecture, Society for Neuroscience
2017 Elected Member, Dana Foundation
2017 Elected Member, International Neuropsychological Society
2016 McKnight Foundation, Memory and Cognitive Disorders Award
2014 Young Investigator Award, Cognitive Neuroscience Society
2013 Young Investigator Award, Society for NeuroEconomics
2012 Lenfest Distinguished Faculty Award, Columbia University
2011 Janet Spence Award for Transformative Early Career Contributions, APS
2010 National Science Foundation Career Development Award
2008 Young Investigator Award, NARSAD
2004 Postdoctoral Individual National Research Service Award; NIMH
2003 Dean's Dissertation Award for Best Dissertation, Rutgers University
1996-7 Lehrman Fellowship for Academic Excellence

RESEARCH SUPPORT

Current funding

2019-2023 Differentiating Reward Seeking and Loss Aversion with Reference-Dependent Learning Models, *NIH/NIMH RO1*, PI (Co-PI Nathaniel Daw)
2018-2022 Prioritization of memory reactivation for decision-making. CRCNS Collaborative Research. *National Science Foundation*, PI (Co-PI Nathaniel Daw)
2017-2020 Understanding How Curiosity Drives Learning
Templeton Foundation, Science of Virtue Award, PI of multi-center project
2017-2020 Mechanisms of Decision Making in Anorexia Nervosa: A Computational Psychiatry Approach, *Klarman Foundation* Research Grant, PI
2017-2021 Beholder's Share by Focusing on Brain Mechanisms in Response to Art
Dana Foundation, PI (Co-PI Eric Kandel)
2020-2025 Brain Research Apprenticeships in New York at Columbia (BRAINYAC)

NIH/NINDS R25, PI (w Paula Croxson)

Completed funding

2015-2020	Neural Mechanisms of Food Choice in Anorexia Nervosa NIH/NIMH R01, Co-PI (with Steinglass)
2014-2020	Computational and Neural Mechanisms of Memory-Guided Decisions NIH/NIDA R01, PI (Co-PI Daw)
2016-2019	How Episodic Memory Guides Decisions: Neural Mechanisms and Implications for Memory Loss McKnight Foundation Memory and Cognitive Disorders Award, PI
2016-2018	Zuckerman Public Outreach Dana Foundation, Co-PI (with Kandel)
2016-2017	Understanding the Effects of Aging on Curiosity and Learning: Neural and Cognitive Mechanisms, PI Columbia Aging Center Faculty Research Fellowship
2014-2016	A Role of Dopamine in Prospection Templeton Foundation, Science of Prospection Award, PI (Co-PI Foerde)
2011-2015	Goals vs. Habits in the Human Brain: Cognitive and Computational Mechanisms NIH – R01, PI
2010-2015	Integrating Neuroimaging and Patient Studies of Learning and Decision Making NSF Career Development Award, PI
2009-2013	Investigating Placebo Effects in Parkinson's Disease with Functional MRI Michael J. Fox Foundation, Co-PI (w Wager)
2009-2014	Learning to Avoid Pain: Computational Mechanisms and Application to Methamphetamine NIH/NIDA, Co-PI and PI of Subcontract (PI: Wager)
2009-2011	Using fMRI to Measure Negative Symptoms in Schizophrenia NIH/NIMH, Co-PI (PI: Smith)
2009-2010	Neural Systems of Learning and Memory in Addiction NIH/NIDA, PI
2009-2010	Neural Systems of Learning and Memory in Addiction NIH/NIDA, PI
2008-2010	The Cognitive Neuroscience of Learning and Motivation in Schizophrenia: Combining fMRI and Patient Studies; NARSAD Young Investigator Award

PUBLICATIONS

Original Research Articles

1. Biderman, N., Bakkour, A., & **Shohamy, D.** (2020). What are memories for? The hippocampus bridges past experience with future decisions. *Trends in Cognitive Science*, In press.
2. Sharp, M. E., Duncan, K., Foerde, K., & **Shohamy, D.** (2020). Dopamine is associated with prioritization of reward-associated memories in Parkinson's disease. *Brain*, In press.
3. Duncan, K., Semmler, A., & **Shohamy, D.** (2019). Modulating the use of multiple memory systems in value-based decisions with contextual novelty. *Journal of cognitive neuroscience*, 31(10), 1455-1467.
4. Bakkour, A., Palombo, D. J., Zylberberg, A., Kang, Y. H., Reid, A., Verfaellie, M., ... & **Shohamy, D.** (2019). The hippocampus supports deliberation during value-based decisions. *eLife*, 8.

5. Rouhani, N., Wimmer, G. E., Schneier, F. R., Fyer, A. J., **Shohamy, D.**, & Simpson, H. B. (2019). Impaired generalization of reward but not loss in obsessive–compulsive disorder. *Depression and anxiety*, 36(2), 121-129.
6. Braun, E.K., Wimmer, G.E., & **Shohamy D.** (2018). Retroactive and graded prioritization of memory by reward. *Nature Communication*, 9:4886.
7. Vikbladh, O., Meager, M., King, Blacmon, Devinsky, O., **Shohamy, D.**, Burgess, N., and Daw, N.D., Hippocampal contributions to model-based planning and spatial memory.. *Neuron*, In press.
8. Nasaleris, T., Bassett, D., Fletcher, A., Kording, K., Kriegeskorte, N., Nienborg, H., Poldrack, R.A., **Shohamy, D.**, and Kay, K. (2018) Cognitive computational neuroscience: A new conference for an emerging discipline. 2018.. *Trends in Cognitive Sciences*, 22:365-367.
9. *Gerraty, R.T., Davidow, J.D., Foerde, K., Galvan, A., Bassett, D.S., & Shohamy, D.* (2018). Dynamic flexibility in striatal-cortical circuits supports reinforcement learning. *Journal of Neuroscience*, 38:10.
10. *Duncan, K.D., Doll, B.B., Daw, N.D., & Shohamy, D.* (2018). More than the sum of its parts: A role for the hippocampus in configural reinforcement learning. *Neuron*, 98:645-657
11. *Foerde, K., Gianini, L., Wang, Y., Wu, P., Shohamy, D., Walsh, B. T., & Steinglass, J. E.* (2018). Assessment of test-retest reliability of a food choice task among healthy individuals. *Appetite*, 123, 352-356.
12. Bornstein, A.M., Khaw, M.W., **Shohamy, D.**, & Daw, N.D. (2017). Reminders of past choices bias decisions for reward in humans. *Nature Communications*, 8, 15958.
13. *Duncan, K.D., Shohamy, D.* (2016). Memory states influence value-based decisions. *Journal of Experimental Psychology: General*, 145(11),1420-1426.
14. *Davidow, J. Y., Foerde, K., Galván, A., & Shohamy, D.* (2016). An upside to reward sensitivity: The hippocampus supports enhanced reinforcement learning in adolescence. *Neuron*, 92(1), 93-99.
15. *Reinen, J. M., Van Snellenberg, J. X., Horga, G., Abi-Dargham, A., Daw, N. D., & Shohamy, D.* (2016). Motivational context modulates prediction error responses in schizophrenia. *Schizophrenia Bulletin*, 42(6), 1467-1475.
16. Van Snellenberg, J. X., Girgis, R. R., Horga, G., van de Giessen, E., Slifstein, M., Ojeil, N., Weinstein, J.J., Moore, H., Lieberman, J.A., **Shohamy, D.** & Smith, E. E. (2016). Mechanisms of working memory impairment in Schizophrenia. *Biological Psychiatry*, 80(8), 617-626.
17. Zaki, J., Kallman, S., Wimmer, G. E., Ochsner, K., & **Shohamy, D.** (2016). Social cognition as reinforcement learning: feedback modulates emotion inference. *Journal of Cognitive Neuroscience*, 28(9), 1270-1282.
18. *Foerde, K., Figner, B., Doll, B. B., Woyke, I. C., Braun, E. K., Weber, E. U., & Shohamy, D.* (2016). Dopamine modulation of intertemporal decision-making: Evidence from Parkinson disease. *Journal of Cognitive Neuroscience*, 28(5), 657-667.
19. *Marvin, C. B., & Shohamy, D.* (2016). Curiosity and reward: Valence predicts choice and information prediction errors enhance learning. *Journal of Experimental Psychology: General*, 145(3), 266.
20. *Sharp, M. E., Foerde, K., Daw, N. D., & Shohamy, D.* (2015). Dopamine selectively remediates' model-based reward learning: A computational approach. *Brain*, 139(2), 355-364.
21. *Foerde, K., Steinglass, J. E., Shohamy, D., & Walsh, B. T.* (2015). Neural mechanisms supporting maladaptive food choices in anorexia nervosa. *Nature neuroscience*, 18(11), 1571.
22. *Doll, B. B., Duncan, K. D., Simon, D. A., Shohamy, D., & Daw, N. D.* (2015). Model-based choices involve prospective neural activity. *Nature Neuroscience*, 18, 767-772.
23. *Steinglass, J., Foerde, K., Kostro, K., Shohamy, D., & Walsh, B. T.* (2015). Restrictive food intake as a choice—A paradigm for study. *International Journal of Eating Disorders*, 48(1), 59-66.
24. *Schmidt, L., Braun, E. K., Wager, T., & Shohamy, D.* (2014) Mind matters: Placebo enhances reward learning in Parkinson's disease. *Nature Neuroscience*, 17(12), 1793-1797.
25. *Roy, M., Shohamy, D., Daw, N.D., Jepma, M., Wimmer, G.E., & Wager, T.* (2014). Representation of aversive prediction errors in the human periaqueductal grey. *Nature Neuroscience*, 17(11), 1607-1612.
26. *Wimmer, G. E. Braun, E.K., Daw, N.D., & Shohamy, D.* (2014). Episodic memory encoding interferes with reward learning and decreases striatal prediction errors. *Journal of Neuroscience*, 34(45), 14901-14912.

27. Gerraty, R. *, Davidow, J*, Wimmer, G. E., Kahn, I., & **Shohamy, D.** (2014). Transfer of learning related to intrinsic connectivity between hippocampus, ventromedial prefrontal cortex, and large-scale networks. *The Journal of Neuroscience*, 34(34), 11297-11303.
28. Van Snellenberg, J. X., Slifstein, M., Read, C., Weber, J., Thompson, J. L., Wager, T. D., **Shohamy, D.**, Abi-Dargham, A., & Smith, E. E. (2014). Dynamic shifts in brain network activation during supracapacity working memory task performance. *Human brain mapping*, 36(4), 1245-1264.
29. Insel, C., Reinen, J., Weber, J., Wager, T. D., Jarskog, L. F., **Shohamy, D.**, & Smith, E. E. (2014). Antipsychotic dose modulates behavioral and neural responses to feedback during reinforcement learning in schizophrenia. *Cognitive, Affective, & Behavioral Neuroscience*, 14(1), 189-201.
30. Reinen, J., Smith, E. E., Insel, C., Kribs, R., **Shohamy, D.**, Wager, T. D., & Jarskog, L. F. (2014). Patients with schizophrenia are impaired when learning in the context of pursuing rewards. *Schizophrenia research*, 152(1), 309.
31. Foerde, K., Race, E., Verfaellie, M., & **Shohamy, D.** (2013). A role for the medial temporal lobe in incremental feedback-driven learning: Evidence from amnesia. *Journal of Neuroscience*, 33:5698-704.
32. Kahn, I., & **Shohamy, D.** (2013). Intrinsic connectivity between the hippocampus, nucleus accumbens, and ventral tegmental area in humans. *Hippocampus*, 23(3), 187-192.
33. Wimmer, G.E. & **Shohamy, D.** (2012). Preference by association: How memory mechanisms in the hippocampus bias decisions. *Science*, 338: 270-273.
34. Foerde, K., Braun, E.K. & **Shohamy, D.** (2012). A tradeoff between feedback-based learning and episodic memory for feedback events: Evidence from Parkinson's disease. *Neurodegenerative Disorders*. 11:93-101.
35. Wimmer, G.E., Daw, N.D. & **Shohamy, D.** (2012). Generalization of value in reinforcement learning by humans. *European Journal of Neuroscience*, Special Issue: Beyond Simple Reinforcement Learning. 35(7), 1092-1104.
36. Ivleva, E., **Shohamy, D.**, Mihalakos, P., Morris, D.W., Carmody, T. & Tamminga, C.A. (2012). Memory generalization is selectively altered in the psychosis dimension. *Schizophrenia Research*, 138(1), 74-80
37. Foerde, K. & **Shohamy, D.** (2011). Feedback timing modulates brain systems for learning in humans. *Journal of Neuroscience*, 31(37), 13157-13167.
38. Wimmer, G.E. & **Shohamy, D.** (2011). The striatum and beyond: Hippocampal contributions to decision making. In M. Delgado, E.A. Phelps, & T.W. Robbins (Eds.), *Attention & Performance XXII* (pp. 281-309). Oxford: Oxford University Press.
39. Sadeh, T., **Shohamy, D.**, Levy, D.R., Reggev, N., & Maril, A. (2011). Cooperation between the hippocampus and the striatum during episodic encoding. *Journal of Cognitive Neuroscience*, 23(7), 1597-1608.
40. **Shohamy, D.** & Adcock, R.A. (2010). Dopamine and adaptive memory. *Trends in Cognitive Science*, 14(10), 464-472.
41. **Shohamy, D.**, Mihalakos, P., Chin, R., Thomas, B., Wagner, A.D., & Tamminga, C. (2010). Learning and generalization in schizophrenia: Effects of disease and antipsychotic drug treatment. *Biological Psychiatry*, 67(10), 926-932.
42. Djonlagic, I., Rosenfeld, A., **Shohamy, D.**, Myers, C.E., Gluck, M.A., & Stickgold, R. (2009). Sleep enhances category learning. *Learning and Memory*, 16(12), 751-755.
43. Meeter, M., **Shohamy, D.**, & Myers, C.E. (2009). Acquired equivalence changes stimulus representations. *Journal of Experimental Analysis of Behavior*, 91(1), 127-141.
44. **Shohamy, D.**, Myers, C.E., Hopkins, R.O., & Gluck, M.A. (2009). Distinct hippocampal and basal ganglia contributions to probabilistic learning and reversal. *Journal of Cognitive Neuroscience*, 21(9), 1821-1833.
45. **Shohamy, D.** & Wagner, A.D. (2008). Integrating memories in the human brain: Hippocampal midbrain encoding of overlapping events. *Neuron*, 60(2), 378-389.
46. Daw, N.D. & **Shohamy, D.** (2008). The cognitive neuroscience of motivation and learning. *Social Cognition, Special Issue: Cognitive Motivation and Motivated Cognition*, 26(5), 593-620.

47. Vadhan, N.P., Myers, C.E., Rubin, E., **Shohamy, D.**, Foltin, R.W., & Gluck, M.A. (2008). Stimulus-response learning in long-term cocaine users: Acquired equivalence and probabilistic category learning. *Drug and Alcohol Dependence*, 93(1-2), 155-162.
48. Nagy, H., Keri, S., Meyers, C.E., Benedek, G., **Shohamy, D.** & Gluck, M.A. (2007). Cognitive sequence learning in Parkinson's disease and amnesic mild cognitive impairment: Dissociation between sequential and non-sequential learning of associations. *Neuropsychologia*, 45(7), 1386.
49. **Shohamy, D.**, Myers, C.E., Geghman, K.D., Sage, J., & Gluck, M.A. (2006). L-Dopa impairs learning, but spares generalization, in Parkinson's disease. *Neuropsychologia*, 44(5), 774-784.
- Meeter, M., Myers, C.E., **Shohamy, D.**, Hopkins, R.O., & Gluck, M.A. (2006). Strategies in probabilistic categorization: Results from a new way of analyzing performance. *Learning & Memory*, 13(2), 230-239.
50. **Shohamy, D.**, Myers, C.E., Grossman, S., Sage, J., & Gluck, M.A. (2005). The role of dopamine in cognitive sequence learning: Evidence from Parkinson's disease. *Behavioral Brain Research*, 156(2), 191-199.
51. Shohamy, D., Myers, C.E., Grossman, S., Sage, J., Gluck, M.A., & Poldrack, R.A. (2004). Cortico-striatal contributions to feedback-based learning: Converging data from neuroimaging and neuropsychology. *Brain*, 127(Pt 4), 851-859.
52. Hopkins, R.O., Myers, C.E., **Shohamy, D.**, Grossman, S., & Gluck, M.A. (2004). Impaired probabilistic category learning in hypoxic subjects with hippocampal damage. *Neuropsychologia*, 42(4), 524-535.
53. **Shohamy, D.**, Myers, C.E., Onlaor, S., & Gluck, M.A. (2004). Role of the basal ganglia in category learning: How do patients with Parkinson's disease learn? *Behavioral Neuroscience*, 118(4), 676-686.
54. Aron, A.R., **Shohamy, D.**, Clark, J., Myers, C.E., Gluck, M.A., & Poldrack, R.A. (2004). Human midbrain sensitivity to cognitive feedback and uncertainty during classification learning. *Journal of Neurophysiology*, 92(2), 1144-1152.
55. Myers, C.E., **Shohamy, D.**, Gluck, M.A., Grossman, S., Onlaor, S., & Kapur, N. (2003). Dissociating medial temporal and basal ganglia memory systems with a latent learning task. *Neuropsychologia*, 41(14), 1919-1928.
56. Myers, C.E., **Shohamy, D.**, Gluck, M.A., Grossman, S., Kluger, A., Ferris, S., Golomb, J., Schnirman, G., & Schwartz, R. (2003). Dissociating hippocampal versus basal ganglia contributions to learning and transfer. *Journal of Cognitive Neuroscience*, 15(2), 185-193.
57. Gluck, M.A., **Shohamy, D.**, & Myers, C.E. (2002). How do people solve the "Weather Prediction" task? Individual variability in strategies for probabilistic category learning. *Learning and Memory*, 9(6), 408-418.
58. Poldrack, R.A., Clark, J., Pare-Blagoev, E.J., **Shohamy, D.**, Creso Moyano, J., Myers, C., & Gluck, M.A. (2001). Interactive memory systems in the human brain. *Nature*, 414(6863), 546-550.
59. **Shohamy, D.**, Allen, M.T., & Gluck, M.A. (2000). Dissociating entorhinal and hippocampal involvement in latent inhibition. *Behavioral Neuroscience*, 114(5), 867-874.

Commentaries, invited reviews, and book chapters

60. **Shohamy, D.** & Schultz, W. Learning and Decision Making. Introduction to edited section, in M. Gazzaniga and R. Mangun, ed., *The Cognitive Neurosciences VI*, Cambridge: MIT Press.
61. Shadlen, M. & **Shohamy, D.** (2016). Decision making and sequential sampling from memory. *Neuron*, 90(5), 927-939.
62. **Shohamy, D.**, & Daw, N. D. (2015). Integrating memories to guide decisions. *Current Opinion in Behavioral Sciences*, 5, 85-90.
63. Sharp, M., Foerde, K., Daw, N., & **Shohamy, D.** (2015). Learning processes in Parkinson's disease and healthy aging (I3-5C). *Neurology*, 84(14 Supplement), P6-063.
64. Doll, B. B., **Shohamy, D.**, & Daw, N. D. (2014). Multiple memory systems as substrates for multiple decision systems. *Neurobiology of learning and memory*, 117, 4-13.
65. **Shohamy, D.** & Turk-Browne, N. Mechanisms for widespread hippocampal involvement in cognition. (2013). *Journal of Experimental Psychology: General*. Commentary and preface to special section on *Dialogues with Neuroscience*, 142(4), 1159-1170.

66. **Shohamy, D.** & Daw. N.D. Habits and reinforcement learning. Chapter in M. Gazzaniga and R. Mangun, ed., *The Cognitive Neurosciences V*, Cambridge: MIT Press. In Press.
67. *Wimmer, G.E. & Shohamy, D.* Dopamine and the cost of aging. (2013). *Nature Neuroscience*. 16(5):519-521.
68. Roy, M., **Shohamy, D.**, & Wager, T.D. (2012). Ventromedial prefrontal-subcortical systems and the generation of affective meaning. *Trends in Cognitive Sciences*, 16(3), 147-156.
69. **Shohamy, D.** (2011). Learning and motivation in the human striatum. *Current Opinion in Neurobiology*, 21(3), 408-414.
70. *Foerde, K. & Shohamy, D.* (2011). The role of the basal ganglia in learning and memory: Insight from Parkinson's disease. *Neurobiology of Learning and Memory*, 96(4), 624-36.
71. Wilbrecht, L. & **Shohamy, D.** (2010). Neural circuits can bridge systems and cognitive neuroscience. *Frontiers in Human Neuroscience*, 3, 81.
72. **Shohamy, D.** & Wagner. A.D. (2009). Integrative encoding. *American Journal of Psychiatry*, 166(3), 284.
73. Preston A.R., **Shohamy, D.**, Tamminga, C.A., & Wagner, A.D. (2005). Hippocampal function, declarative memory, and schizophrenia: anatomic and functional neuroimaging considerations. *Current Neurology and Neuroscience Reports*, 5(4), 249-256
74. Wilbreth, L. & **Shohamy, D.** (2010). Neural circuits can bridge systems and cognitive neuroscience. *Frontiers in Human Neuroscience*, 3, 81.
75. **Shohamy, D.**, Myers, C.E., Kalanithi, J., & Gluck, M.A. (2008). Basal ganglia and dopamine contributions to probabilistic category learning.