

James D. Howard, Ph.D.

Curriculum Vitae

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Department of Psychology
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Employment

2020-present	Assistant Professor Brandeis University, Waltham, MA
2015–2020	Postdoctoral Fellow Northwestern University, Chicago, IL Principal Investigator: Thorsten Kahnt, Ph.D.
2005–2009	Research Technician Northwestern University, Chicago, IL Principal Investigator: Jay Gottfried, M.D., Ph.D.
2003–2005	Research Technician Massachusetts General Hospital, Boston, MA Principal Investigator: Nikos Makris, M.D., Ph.D.

Education

2015	Ph.D., Neuroscience Northwestern University, Chicago, IL Principal Investigator: Jay Gottfried, M.D., Ph.D.
2002	B.S., Biomedical Engineering University of Akron, Akron, OH

Research Support

2020–2023	NARSAD Young Investigator Grant Brain & Behavior Research Foundation	PI: James Howard
2015–2017	NIH T32NS047987 Training Program in the Neuroscience of Human Cognition	PI: Ken Paller
2013–2015	NIH F31DC013500 Ruth L. Kirchstein National Research Service Award: Neural mechanisms of olfactory reward value processing in the human brain	PI: Jay Gottfried
2011–2013	NIH T32MH067564 Neurobiology of Information Storage Training Program	PI: Aryeh Routtenberg
2010–2011	NIH T32AG020418 Neuroscience in the Early Years	PI: Enrico Mugnaini

Publications

Manuscripts in Progress

Qiao X, Wolters L, Howard JD (2023) Mental representations mediate aversive learning in humans. *In revision.*

Howard JD, Edmonds D, Kahnt T (2023) Decoding identity information in ensemble prediction error responses in the human midbrain. *In preparation.*

Published Journal Articles

Howard JD, Kahnt T. (2021) To be specific: The role of orbitofrontal cortex in signaling reward identity. *Behav. Neurosci.*, 135(2): 210-217.

Howard JD, Kahnt T. (2021) Causal investigations into orbitofrontal control of human decision making. *Curr. Opin. Behav. Sci.* 38: 14-19.

Wang F, Howard JD, Voss JL, Schoenbaum G, Kahnt T. (2020) Targeted stimulation of an orbitofrontal network disrupts decisions based on inferred, not experienced outcomes. *J. Neurosci.* 40(45): 8726-8733.

Howard JD, Reynolds R, Smith DE, Voss JL, Schoenbaum G, Kahnt T. (2020) Targeted stimulation of human orbitofrontal networks disrupts outcome-guided behavior. *Current Biology.* 30(3): 490-498.

Stalnaker TA*, Howard JD*, Takahashi YK, Gershman SJ, Kahnt T*, Schoenbaum G*. (2019) Dopamine neuron ensembles signal the content of sensory prediction errors. *eLife.* 8: e49315.

*shared first or senior authorship

Bhutani S, Howard JD, Reynolds R, Zee PC, Gottfried JA, Kahnt T. (2019) Olfactory connectivity mediates sleep-dependent food intake in humans. *eLife.* 8: e49053

Suarez JA, Howard JD, (2019) Schoenbaum G, Kahnt T. Sensory prediction errors in the human midbrain signal identity violations independent of perceptual distance. *eLife.* 8: e43962

Bao X, Gjorgieva E, Shanahan LK, Howard JD, Kahnt T, Gottfried JA. (2019) Grid-like neural representations support olfactory navigation of a two-dimensional odor space. *Neuron.* 102(5): 1066-1075

Howard JD, Kahnt T. (2018) Identity prediction errors in the human midbrain update reward-identity expectations in the orbitofrontal cortex. *Nat. Commun.* 9(1): 1611.

Howard JD, Kahnt T. (2017) Identity-specific reward representations in orbitofrontal cortex are modulated by selective devaluation. *J. Neurosci.* 37(10): 2627-2638.

Howard JD, Kahnt T, Gottfried JA. (2016) Converging prefrontal pathways support associative and perceptual features of conditioned stimuli. *Nat. Commun.* 7: 11546.

Bao X, Raguet LL, Cole SM, Howard JD, Gottfried JA. (2016) The role of piriform associative connections in odor categorization. *eLife.* 5: e13732.

Howard JD, Gottfried JA, Tobler PN, Kahnt T. (2015) Identity-specific coding of future rewards in the human orbitofrontal cortex. *PNAS.* 112(16): 5195-200.

- Howard JD, Gottfried JA. (2014) Configural and elemental coding of natural odor mixture components in the human brain. *Neuron*. 84: 857-69.
- Hauner KK, Howard JD, Zelano C, Gottfried, JA. (2013) Stimulus-specific enhancement of fear extinction during slow-wave sleep. *Nat. Neurosci*. 16: 1553-55.
- Wu KN, Tan BK, Howard JD, Conley DB, Gottfried JA. (2012) Olfactory input is critical for sustaining odor quality codes in human orbitofrontal cortex. *Nat. Neurosci*. 15: 1313-9.
- Vilares I, Howard JD, Fernandes HL, Gottfried JA, Kording KP. (2012) Differential representations of prior and likelihood uncertainty in the human brain. *Curr. Biol*. 22: 1641-8.
- Li W, Lopez L, Osher J, Howard JD, Parrish TB, Gottfried JA. (2010) Right orbitofrontal cortex mediates conscious olfactory perception. *Psych. Science*. 39: 287-92.
- Li W, Howard JD, Gottfried JA. (2010) Disruption of odour quality coding in piriform cortex mediates olfactory deficits in Alzheimer's disease. *Brain*. 133: 2714-26.
- Hodge SM, Makris N, Kennedy DN, Caviness VS, Howard JD, McGrath L, Steele S, Frazier JA, Tager-Flusberg H, Harris GJ. (2010) Cerebellum, language, and cognition in autism and specific language impairment. *J. Autism Dev. Disord*. 40: 300-316.
- Howard JD, Plailly J, Grueschow M, Haynes JD, Gottfried JA. (2009) Odor quality coding and categorization in human posterior piriform cortex. *Nat. Neurosci*. 12: 932-938.
- Li W, Howard JD, Parrish TB, Gottfried JA. (2008) Aversive learning enhances perceptual and cortical discrimination of indiscriminable odor cues. *Science*. 319: 1842-1845.
- Plailly J, Howard JD, Gitelman DR, Gottfried JA. (2008) Attention to odor modulates thalamocortical connectivity in the human brain. *J. Neurosci*. 28: 5257-5267.
- Frazier JA, Breeze JL, Papadimitriou G, Kennedy DN, Hodge SM, Moore CM, Howard JD, Rohan MP, Caviness VS, Makris N. (2007) White matter abnormalities in children with and at risk for bipolar disorder. *Bipolar Disorders*. 9: 799-809.
- Cannistraro PA, Makris N, Howard JD, Wedig MM, Hodge SM, Wilhelm S, Kennedy DN, Rauch SL. (2007) A diffusion tensor imaging study of white matter in obsessive-compulsive disorder. *Depression and Anxiety*. 24: 440-446.

Abstracts and Conference Presentations

Oral Presentations

Howard JD, Reynolds R, Smith DE, Voss JL, Schoenbaum G, Kahnt T. Targeted stimulation of human orbitofrontal networks disrupts odor reward-guided behavior. Annual meeting of the Association for Chemoreception Sciences. Bonita Springs, FL, 2019

Howard JD. Identity prediction errors in the human midbrain update reward-identity expectations in the orbitofrontal cortex. Annual Computational and Systems Neuroscience (Cosyne) meeting workshop. Breckenridge, CO, 2018.

Howard JD, Kahnt T. Reward identity and value prediction errors differentially update task state representations in human orbitofrontal cortex and amygdala. Annual meeting of the Society for Neuroscience. Washington, D.C., 2017.

Howard JD, Kahnt T. Food odors reinforce behavior in a value-based choice task. Annual meeting of the Society for Neuroscience. Chicago, IL, 2015.

Howard JD, Gottfried JA, Tobler PN, Kahnt T. Neural circuitry underlying expected food odor value in humans. Annual meeting of the Association for Chemoreception Sciences. Bonita Springs, FL, 2015.

Howard JD, Haynes JD, Gottfried JA. Distributed neural representations of odor quality in human piriform cortex. Annual meeting of the Society for Neuroscience. Atlanta, GA, 2006.

Poster Presentations

Howard JD, Edmonds DS, Kahnt T. Disentangling the content of sensory prediction errors in the human midbrain. Annual meeting of the Society for Neuroscience. Virtual meeting, 2021

Howard JD, Stalnaker TA, Schoenbaum G, Kahnt T. Decoding the content of olfactory prediction errors in the human midbrain. International Symposium on Olfaction and Taste. Virtual meeting, 2020.

Howard JD, Reynolds R, Smith DE, Voss JL, Schoenbaum G, Kahnt T. Targeted stimulation of human orbitofrontal networks disrupts outcome-guided behavior. Fourth Quadrennial Meeting on Orbitofrontal Cortex Function. Paris, France, 2019.

Howard JD, Stalnaker TA, Schoenbaum G, Kahnt T. Midbrain fMRI ensemble patterns encode the identity of sensory prediction errors in humans. Annual meeting of the Society for Neuroscience. Chicago, IL, 2019.

Howard JD, Reynolds R, Smith DE, Voss JL, Schoenbaum G, Kahnt T. Targeted non-invasive stimulation of human orbitofrontal networks disrupts outcome-guided behavior. Annual meeting of the Society for Neuroscience. San Diego, CA, 2018.

Howard JD, Kahnt T. Odor Identity Expectations in Human Orbitofrontal Cortex are Updated by Sensory Prediction Errors. Annual meeting of the Association for Chemoreception Sciences. Bonita Springs, FL, 2018.

Howard JD, Kahnt T. Reward identity prediction error signaling in human orbitofrontal cortex. Annual meeting of the Cognitive Neuroscience Society. San Francisco, CA, 2017.

Howard JD, Kahnt T. General and specific modulation of reward identity representations in human OFC after satiety. Annual meeting of the Society for Neuroscience. San Diego, CA, 2016.

Howard JD, Kahnt T. Sensory-specific satiety modulates neural representations of expected food odor rewards in humans. Annual meeting of the Association for Chemoreception Sciences. Bonita Springs, FL, 2016.

Howard JD, Kahnt T. Devaluation modulates identity-specific outcome representations in the human brain. Third Quadrennial Meeting on Orbitofrontal Cortex Function. Paris, France, 2015.

Howard JD, Kahnt T, Gottfried JA. Reward-related modulation of conditioned stimulus representations after associative learning. Annual meeting of the Association for Chemoreception Sciences. Bonita Springs, FL, 2014.

Howard JD, Kahnt T, Gottfried JA. Reward-related modulation of conditioned stimulus perception after associative learning. Annual meeting of the Cognitive Neuroscience Society. Boston, MA, 2014.

Gottfried JA & Howard JD. Elemental encoding of olfactory reward value in human orbitofrontal cortex. Annual meeting of the Society for Neuroscience. New Orleans, LA, 2012.

Howard JD & Gottfried JA. Behavioral significance of natural odor mixture components in the human brain. International Symposium on Olfaction and Taste. Stockholm, Sweden, 2012.

Howard JD & Gottfried JA. Reward devaluation of natural food odors and their components in the human brain. Annual meeting of the Society for Neuroscience. Washington D.C., 2011.

Howard JD & Gottfried JA. Reward-related representations of Natural Food Odors in the Human Brain. Annual Meeting of the Association for Chemoreception Sciences. St.Petersburg, FL, 2011.

Howard JD, Plailly J, Grueschow M, Haynes JD, Gottfried JA. Odor object coding and categorization in human posterior piriform cortex. Annual meeting of the Association for Chemoreception Sciences. Sarasota, FL, 2009.

Howard JD, Li W, Gottfried JA. Olfactory probes of limbic dysfunction in Alzheimer's Disease. International Symposium on Olfaction and Taste. San Francisco, CA, 2008.

Howard JD, Parrish T, Plailly J, Haynes JD, Gottfried JA. Multivariate pattern analysis of odor quality in human piriform cortex. Annual meeting of the Organization for Human Brain Mapping. Chicago, IL, 2007.

Howard JD, Parrish T, Plailly J, Haynes JD, Gottfried JA. Multivariate pattern analysis of odor quality in human piriform cortex. Annual meeting of the Association for Chemoreception Sciences. Sarasota, FL, 2007.

Invited talks

2022	Harvard University: Cognition, Brain, & Behavior Seminar
2022	Brown University: Social-Cognitive Seminar Series
2020	University of Zürich: Neuroeconomics Seminar
2020	University of New Mexico: Cognition, Brain, & Behavior Seminar
2017	Princeton University: PDP Seminar

Department talks

2016	Cognitive Brain Mapping Group, Northwestern University
2015	Cognitive Brain Mapping Group, Northwestern University

Awards and Honors

2019	ACheMS Polak Young Investigator Award
2018	ACheMS Polak Postdoctoral Travel Award
2016	Office of Postdoctoral Affairs Travel Award
2014	Interdepartmental Neuroscience Program Travel Award
2014	ACheMS Travel Award

Society Memberships

Society for Neuroscience
Association for Chemoreception Sciences
Cognitive Neuroscience Society

Ad Hoc Reviewer

Nature Communications; Nature Human Behavior; Journal of Neuroscience; Trends in Cognitive Science; NeuroImage; Human Brain Mapping; Scientific Reports; Behavioral Neuroscience; European Journal of Neuroscience; Cognitive, Affective, and Behavioral Neuroscience; Chemical Senses; Perception; Chemosensory Perception; Neuropsychologia; Brain Structure & Function; Brain Imaging & Behavior; Cerebral Cortex; PLOS ONE; Cognitive, Affective, and Behavioral Neuroscience; Appetite; Experimental Brain Research

Courses Taught

2021, Spring	NPSY 170a: Decision Neuroscience
2021, Fall	PSYC 10a: Introduction to Psychology
2022, Spring	NPSY 170a: Decision Neuroscience
2022, Fall	PSYC 10a: Introduction to Psychology
2023, Spring	NPSY 170a: Decision Neuroscience

Mentoring Experience

Primary advisor to 3 PhD students, 3 Masters student, and 2 undergraduate students completing research honors theses from 2020-2023

Brandeis University Service

Psychology graduate admissions committee: 2021, 2022
Neuroscience graduate committee: 2023
Undergraduate Research and Creative Collaborations (URCC) Advisory Group: 2022-2023
Summer Undergraduate Research Fellowship Proposal Committee: 2023
Dissertation committees
Neuroscience program rotation report reader
Brandeis University Faculty Ambassador
Senior Honors Thesis reader
Faculty participant in the Provost's Teaching Innovation Grant