

Sean Dae Houlihan

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<https://daeh.info>

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APPOINTMENTS


Postdoc.	Dartmouth College	2022–
	Fellow, Neukom Institute for Computational Science	2023–
	Program in Cognitive Science	
	Department of Psychological and Brain Sciences	
	Department of Computer Science	



EDUCATION

Ph.D.	Massachusetts Institute of Technology	2015–2022
	Department of Brain and Cognitive Sciences	
	Dissertation: <i>A computational framework for emotion understanding</i>	
	Advisors: Rebecca Saxe, Josh Tenenbaum, John Gabrieli	
	Committee: <i>Ibid.</i> , Luke Chang	
B.A.	University of Colorado, Boulder	2004–2008
	Molecular, Cellular, and Developmental Biology (Major)	
	Biochemistry (Major)	

AWARDS / HONORS / FELLOWSHIPS

2024	Glushko Dissertation Prize, Cognitive Science Society (CogSci)
2023	Best Dissertation Award, Society for Affective Science (SAS)
2023–	Neukom Institute for Computational Science Postdoctoral Fellowship
2019–2020	Friends of the McGovern Institute Fellowship
2018	Austen Riggs Scholar in Computational Psychiatry Award
2018	Cognitive Computational Neuroscience (CCN) Travel Award
2017–	Fellow at The Dalai Lama Center for Ethics and Transformative Values
2017	Angus MacDonald Award for Excellence in Undergraduate Teaching
2014	Mind and Life, Summer Research Institute Fellowship
2013	California Institute of Regenerative Medicine (CIRM), Bridges Award
2004–2008	University of Colorado Boulder, Honors Program
2004	M.R. Hellie Memorial Scholarship

- Aczel, B., Szaszi, B., Clelland, H. T., Kovacs, M., Holzmeister, F., Ravenzwaaij, D. van, Schulz-Kümpel, H., Hoffmann, S., Nilsson, G., Kosa, L., Torma, Z. A., Abdelfatah, Y., Aberson, C. L., Acar, O. A., Acem, E., Adamkovic, M., Adamovich, T., Adiasto, K., Ahnström, L., ... **Houlihan, S. D.**, ... Mikolajczak, G. (2026). Investigating the Analytical Robustness of the Social and Behavioural Sciences. *Nature*, 652(8108), 135–142. <https://doi.org/10.1038/s41586-025-09844-9>
- Miske, O., Abatayo, A. L., Daley, M., Dirzo, M., Fox, N., Haber, N., Hahn, K. M., Struhl, M. K., Mawhinney, B., Silverstein, P., Stankov, T., Tyner, A. H., Adamkovič, M., Alzahawi, S., Anafinova, S., Awtrey, E., Axze, E., Bailey, J., Bakker, B. N., ... **Houlihan, S. D.**, ... Errington, T. M. (2026). Investigating the Reproducibility of the Social and Behavioural Sciences. *Nature*, 652(8108), 126–134. <https://doi.org/10.1038/s41586-026-10203-5>
- Zhang, C., Ouyang, Z., Lee, K., Agarwal, N., **Houlihan, S. D.**, Vosoughi, S.*, & Lo, S.-Y.* (2025). Overcoming Multi-Step Complexity in Multimodal Theory-of-Mind Reasoning: A Scalable Bayesian Planner. *Proceedings of the 42nd International Conference on Machine Learning*, 267. <https://doi.org/10.48550/arXiv.2506.01301> [spotlight, top 2.6%]
- Kwon, M., **Houlihan, S. D.**, & Phillips, J. (2025). Cross-Cultural Emotion Concept Representation: A Comparison of English, Korean, and Large Language Model Representations. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 47, 2881–2888. <https://escholarship.org/uc/item/373553tb>
- Wu, S., **Houlihan, S. D.**, Meyer, M. L., & Phillips, J. (2025). Collective Emotions: Appraisal-based Similarity in Emotion Attributions to Individuals and Groups. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 47, 5357–5363. <https://escholarship.org/uc/item/6xm4w3p7>
- Lamba, A., **Houlihan, S. D.**, & Saxe, R. (2025). Solving Strategic Social Coordination via Bayesian Learning. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 47, 6117–6123. <https://escholarship.org/uc/item/9w07j1fr>
- Brewer, J. A., **Houlihan, S. D.**, Yetter, K. M., & Davis, J. H. (2025). Mindfulness and the Addictive Process: Psychological Models and Neurobiological Mechanisms. In B. D. Ostafin, M. D. Robinson, & B. P. Meier (Eds.), *Handbook of Mindfulness and Self-Regulation: Theoretical, Cognitive Neuroscience, Social-Personality, and Clinical Perspectives: Handbook of Mindfulness and Self-Regulation: Theoretical, Cognitive Neuroscience, Social-Personality, and Clinical Perspectives* (pp. 393–415). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-91451-5_17 
- Chen, T.*, **Houlihan, S. D.***, Chandra, K., Tenenbaum, J. B., & Saxe, R. (2024). Intervening on Emotions by Planning Over a Theory of Mind. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 46, 5887–5894. <https://escholarship.org/uc/item/4gz7c85c>
- Halchenko, Y. O., Goncalves, M., Ghosh, S., Velasco, P., Castello, M. V. O. di, Salo, T., Wodder, J. T., Hanke, M., Sadil, P., Gorgolewski, K. J., Ioanas, H.-I., Rorden, C., Hendrickson, T. J., Dayan, M., **Houlihan, S. D.**, Kent, J., Strauss, T., Lee, J., To, I., ... Kennedy, D. N. (2024). HeuDiConv – Flexible DICOM Conversion into Structured Directory Layouts. *Journal of Open Source Software*, 9(99), 5839. <https://doi.org/10.21105/joss.05839>
- Houlihan, S. D.**, Kleiman-Weiner, M., Hewitt, L. B., Tenenbaum, J. B., & Saxe, R. (2023). Emotion Prediction as Computation over a Generative Theory of Mind. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 381(2251), 20220047. <https://doi.org/10.1098/rsta.2022.0047>

- Houlihan, S. D.**, Ong, D., Cusimano, M., & Saxe, R. (2022). Reasoning about the Antecedents of Emotions: Bayesian Causal Inference over an Intuitive Theory of Mind. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 44, 854–861. <https://escholarship.org/uc/item/7sn3w3n2>
- Anzellotti, S., **Houlihan, S. D.**, Liburd Jr., S., & Saxe, R. (2021). Leveraging Facial Expressions and Contextual Information to Investigate Opaque Representations of Emotions. *Emotion*, 21(1), 96–107. <https://doi.org/10.1037/emo0000685>
- Houlihan, S. D.**, Tenenbaum, J. B., & Saxe, R. (2021). Linking Models of Theory of Mind and Measures of Human Brain Activity. In M. Gilead & K. N. Ochsner (Eds.), *The Neural Basis of Mentalizing: The Neural Basis of Mentalizing* (pp. 209–235). Springer International Publishing. https://doi.org/10.1007/978-3-030-51890-5_11 
- Saxe, R., & **Houlihan, S. D.** (2017). Formalizing Emotion Concepts within a Bayesian Model of Theory of Mind. *Current Opinion in Psychology*, 17, 15–21. <https://doi.org/10.1016/j.copsyc.2017.04.019>
- Lutterveld, R. van, **Houlihan, S. D.**, Pal, P., Sacchet, M. D., McFarlane-Blake, C., Patel, P. R., Sullivan, J. S., Ossadtchi, A., Druker, S., Bauer, C., & Brewer, J. A. (2017). Source-Space EEG Neurofeedback Links Subjective Experience with Brain Activity during Effortless Awareness Meditation. *Neuroimage*, 151, 117–127. <https://doi.org/10.1016/j.neuroimage.2016.02.047>
- Houlihan, S. D.**, & Brewer, J. A. (2016). The Emerging Science of Mindfulness as a Treatment for Addiction. In E. Shonin, W. V. Gordon, & M. D. Griffiths (Eds.), *Mindfulness and Buddhist-Derived Approaches in Mental Health and Addiction: Mindfulness and Buddhist-Derived Approaches in Mental Health and Addiction* (pp. 191–210). Springer International Publishing. https://doi.org/10.1007/978-3-319-22255-4_9 

INVITED TALKS (SELECTED)

2026	Stanford Psychophysiology Laboratory (Prof. James Gross); Stanford
2025	Computation and Decision-Making Lab (Prof. Mark Ho); NYU
2024	Cognition Colloquium; University of California, Berkeley
2024	Awards Symposium; Conference of the Cognitive Science Society
2024	Awards Symposium; Conference of the Society for Affective Science
2022	Consortium for Interacting Minds; Dartmouth College
2022	Machine Common Sense Working Group; IBM-MIT-Harvard
2021	Center for Brain Minds and Machines Annual Retreat; MIT
2018	Morality Lab (Prof. Liane Young); Boston College
2017	Cognitive Lunch; MIT
2016	Biology Department; Berkeley City College
2016	Consciousness Hacking SF (San Francisco, CA)
2016	Peabody Essex Museum (Salem, MA)
2016	SinhaLab (Prof. Pawan Sinha), MIT

CONFERENCE PRESENTATIONS (ORAL)

- Houlihan, S. D.**, Ong, D. C., Cusimano, M., & Saxe, R. (November 2023). *Inferring Others' Decisions by Reasoning About Their Emotions* [Conference presentation]. New England Research on Decision Making (NERD), Harvard University, Cambridge, MA.
- Houlihan, S. D.**, Ong, D. C., Cusimano, M., & Saxe, R. (July 2022). *Reasoning About the Antecedents of Emotions: Bayesian Causal Inference over an Intuitive Theory of Mind* [Conference presentation]. 44th Annual Conference of the Cognitive Science Society (CogSci), Toronto, Canada.
- Houlihan, S. D.**, Ong, D. C., & Saxe, R. (April 2022). *Reasoning About Emotions, Expressions, And Events: Bayesian Causal Inference over an Intuitive Theory* [Conference presentation]. Society for Affective Science (SAS) Conference, Remote. **[Top Ranked Abstract]**
- Houlihan, S. D.**, Kleiman-Weiner, M., Tenenbaum, J. B., & Saxe, R. (October 2019). *A Generative Model of Context-Based Emotion Reasoning* [Conference presentation]. Interdisciplinary Advances in the Development of Emotion Understanding Pre-conference, at the Biennial Meeting of the Cognitive Development Society (CDS), Louisville, KY.
- Houlihan, S. D.**, Kleiman-Weiner, M., Tenenbaum, J. B., & Saxe, R. (September 2018). *Modeling Emotion Attribution as Inverse Inference in an Intuitive Theory of Mind* [Conference presentation]. Conference on Cognitive Computational Neuroscience (CCN), Philadelphia, PA. **[CCN Student Travel Award]**
- Houlihan, S. D.**, Kleiman-Weiner, M., Tenenbaum, J. B., & Saxe, R. (May 2018). *Emotion Attribution as Bayesian Inference in an Intuitive Theory of Mind* [Conference presentation]. Symposium, "Predictive Social Cognition: Neural and Computational Approaches to Understanding How Perceivers Glimpse the Social Future," at the 30th Association for Psychological Science (APS) Annual Convention, San Francisco, CA.

CONFERENCE PRESENTATIONS (POSTERS)

- Houlihan, S. D.**, Jacoby, N., & Chang, L. J. (March 2025). *Learning a Mental Model of Emotion Through Bayesian Hypothesis Revision* [Poster presentation]. Society for Affective Science (SAS) Conference, Portland, OR.
- Houlihan, S. D.**, Xiao, G., & Phillips, J. (August 2024). *Contextual Dependence of the Knobe Effect: Reversals under Counterfactual Contrasts* [Poster presentation]. Conference on Cognitive Computational Neuroscience (CCN), Cambridge, MA. https://2024.ccneuro.org/pdf/442_Paper_authored_hxp-authored.pdf
- Houlihan, S. D.**, Tenenbaum, J. B., & Saxe, R. (November 2023). *Expressions in Context: A Neuro-Symbolic Approach to Building Stimulus-Computable Models of Emotion Understanding* [Poster presentation]. Princeton Summit on Affective Science (PSAS), Princeton, NJ.
- Houlihan, S. D.**, Kleiman-Weiner, M., Tenenbaum, J. B., & Saxe, R. (July 2019). *Emotion Attributions Echo the Structure of People's Intuitive Theory of Psychology* [Poster presentation]. 41st Annual Conference of the Cognitive Science Society (CogSci), Montreal, Canada.
- Houlihan, S. D.**, Kleiman-Weiner, M., Tenenbaum, J. B., & Saxe, R. (October 2018). *Formalizing People's Intuitive Theory of Emotions as a Probabilistic Program* [Poster presentation]. International Conference on Probabilistic Programming (PROBPROG), Boston, MA.
- Houlihan, S. D.**, Kleiman-Weiner, M., Tenenbaum, J. B., & Saxe, R. (September 2018). *A Generative Model of People's Intuitive Theory of Emotions: Inverse Planning in Rich Social Games* [Poster presentation]. Duality's End: Computational Psychiatry and the Cognitive Science of Representation, Stockbridge, MA. **[Erikson Institute Travel Award]**

- Houlihan, S. D.**, Kleiman-Weiner, M., Tenenbaum, J. B., & Saxe, R. (July 2018). *A Generative Model of People's Intuitive Theory of Emotions: Inverse Planning in Rich Social Games* [Poster presentation]. 40th Annual Conference of the Cognitive Science Society (CogSci), Madison, WI.
- Houlihan, S. D.**, Kleiman-Weiner, M., Tenenbaum, J. B., & Saxe, R. (March 2018). *Reverse-Engineering Emotional Intelligence: Generative Models of an Intuitive Theory of Emotions* [Poster presentation]. MIT Intelligence Quest (MITIQ), Cambridge, MA.
- Anzellotti, S., **Houlihan, S. D.**, & Saxe, R. (September 2017). *Nonlinear Statistical Dependence Outperforms Linear Dependence in Bayesian Inferences About the Neural Networks Underlying Simulated fMRI Data* [Poster presentation]. Conference on Cognitive Computational Neuroscience (CCN), New York City, NY. http://ccneuro.org/2017/abstracts/abstract_3000117.pdf
- Houlihan, S. D.**, & Saxe, R. (April 2017). *Modeling Emotion Attributions as Inference in an Intuitive Theory of Mind* [Poster presentation]. Wisconsin Symposium on Emotion, Madison, MI.
- Houlihan, S. D.**, Lutterveld, R. van, Pal, P., Sacchet, M. D., McFarlane-Blake, C., Patel, P. R., Bauer, C., & Brewer, J. A. (February 2015). *Source-Estimated EEG Neurofeedback for Effortless Awareness Meditation* [Poster presentation]. Real-time Functional Imaging and Neurofeedback Conference, Gainesville, FL.
- Amin, N., **Houlihan, S. D.**, & Kaufer, D. (November 2014). *The Role of Stress Hormones in Prosociality in Rats* [Poster presentation]. Science of Compassion Conference, San Francisco, CA.
- Houlihan, S. D.**, Lutterveld, R. van, Pal, P., McFarlane-Blake, C., Patel, P., Garrison, K. A., Whitfield-Gabrieli, S., & Brewer, J. A. (November 2014). *Multimodal Real Time Neurofeedback to Dissect Default Network Function Related to Meditation, Addiction and Stress* [Poster presentation]. Basic Research/Graduate School of Biomedical Sciences Retreat, University of Massachusetts Medical School, Amherst, MA.
- Houlihan, S. D.**, Taravosh-Lahn, K., Hamilton, J., Francis, D., & Kaufer, D. (July 2014). *Hippocampal White-Matter Remodeling Due to Early Life Environment* [Poster presentation]. CIRM Bridges Trainee Conference, California Institute of Regenerative Medicine, Burlingame, CA.

TEACHING EXPERIENCE (FULL TERM, SOLE INSTRUCTOR)

Dartmouth College

COGS 50.09: *Computational Models of Social Cognition*
2024 Winter, 2025 Winter, 2026 Winter

TEACHING EXPERIENCE (WORKSHOPS)

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| 2025 | <i>Building computational models of social cognition in memo</i> – Tutorial given at the 2025 Annual Meeting of the Cognitive Science Society (CogSci) in San Francisco, CA. Organizers: Kartik Chandra, Sean Dae Houlihan, Max Kleiman-Weiner. |
| 2025 | <i>Bayesian models of emotion understanding</i> – Methods Roundtable facilitated at the Society for Affective Science (SAS) Conference in Portland, OR. |
| 2024 | <i>Bayesian Theory of Mind Models</i> – Methods Workshop given at the Society for Affective Science (SAS) Conference in New Orleans, LA. |

TEACHING EXPERIENCE (OTHER)

Harvard University

TA – HST583: *Functional Magnetic Resonance Imaging, Data Acquisition and Analysis*
2017 Fall

Massachusetts Institute of Technology

TA – 9.46: *Neuroscience of Morality*
2016 Fall **[Award for excellence in undergraduate teaching]**

MIT Educational Studies Program (ESP)

Instructor – S10607: *The Neuroscience of Meditation*
2016 IAP

Instructor – S9746: *The Neuroscience of Meditation*
2015 IAP

Summer Schools

TA – *Methods In Neuroscience At Dartmouth (MIND)* at Dartmouth College
2023 Summer

TA – *Brains, Minds, and Machines Summer Course, CBMM* (a NSF STC) at Woods Hole
2017 Summer

Berkeley City College

Co-instructor – Bio 230A: *Scientific Instrumentation I*
2012 Spring, 2012 Fall

TA – Bio 230B: *Scientific Instrumentation II*
2012 Spring

TA – Bio 33: *Applied Immunology*
2012 Spring

TA – Bio 10: *Introduction to Biology*
2012 Spring

TA – Bio 34: *Genetics*
2012 Fall

TA – Bio 1A: *General Biology*
2009 Spring, 2009 Fall, 2009 Summer, 2008 Fall

TA – Bio 10: *Introduction to Biology*
2008 Fall

National Outdoor Leadership School (NOLS)

Instructor – *Rocky Mountain Lightweight Backpacking Seminar*
2011 Summer

PROFESSIONAL SERVICE

2024, 2025	Awards Committee Member – Society for Affective Science (SAS)
2023	Editor – Application Statement Feedback Program (ASFP; supports PhD applicants who identify as an underrepresented minority)
2019–2021	Mentor – MIT BCS Research Scholars Program (post-baccalaureate program for individuals from disadvantaged backgrounds)
2017	Mentor – MIT Summer Research Program (aims to broaden participation in research by supporting students from diverse backgrounds)
Ad Hoc Reviewer	Cognition, Open Mind, Developmental Psychology, IEEE Transactions on Affective Computing, Topics in Cognitive Science (topiCS), CogSci, CCN

PRESS

2023	Society for Affective Science Newsletter, “Understanding emotions: How do we predict what others are feeling?” by Dr. Marissa Ogren
2023	MIT News, “Computational model mimics humans’ ability to predict emotions” by Anne Trafton