

Rachit Dubey

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Experience & Education

- Jan 2023– Postdoctoral Research Fellow, MIT Sloan School of Management
- 2018–23 PhD, Computer Science, Princeton University
- 2015–18 MS, Education, University of California, Berkeley, 2018
- 2008– 12 BEng, Computer Science, Nanyang Technological University, Singapore, 2012

Publications

ARTICLES UNDER REVIEW

Kraft-Todd, G.*, **Dubey, R.***, Yoeli, E., Rand D., & Bhanot, S. (revise & resubmit). Public good messaging motivates the wealthy to reduce water consumption. *Nature Communications*. [[preprint](#)]

Dubey, R., Ho, M., Mehta, H., & Griffiths, T.L. (revise & resubmit). Aha! moments correspond to metacognitive prediction errors. *Nature Human Behavior*. [[preprint](#)]

Sukhov, N.*, **Dubey, R.***, Duke, A., & Griffiths, T.L. (under review). When to Keep trying and when to let go: Benchmarking optimal quitting. [[preprint](#)]

Dubey, R., Hardy, M., Griffiths, T.L., & Bhui R (under review). AI-generated visuals of car-free American cities help increase support for sustainable transport policies. [[preprint](#)]

JOURNAL ARTICLES

Dulberg, Z., **Dubey, R.**, Berwian, I., & Cohen, J. (2023). Having “multiple selves” helps learning agents explore and adapt in complex changing worlds. *Proceedings of the National Academy of Sciences*, 120(28), e2221180120

Dubey, R., Griffiths, T.L., & Dayan, P. (2022). The pursuit of happiness: A reinforcement learning perspective on habituation and comparisons. *PLOS Computational Biology*, 18(8), e1010316. [[See press coverage below](#)]

Dubey, R., Griffiths, T.L., & Lombrozo, T. (2022). If it’s important, then I’m curious: Increasing perceived usefulness stimulates curiosity. *Cognition*, 226, 105193.

Dubey, R.*, Mehta, H.*, & Lombrozo, T. (2021). Curiosity is contagious: A social influence intervention to induce curiosity. *Cognitive Science*, 45(2), e12937.

Dubey, R. & Griffiths, T.L. (2020). Understanding exploration in humans and machines by formalizing the function of curiosity. *Current Opinion in Behavioral Sciences*, 35, 118-124.

Dubey, R. & Griffiths, T.L. (2020). Reconciling novelty and complexity via a rational analysis of curiosity. *Psychological Review*, 127(3), 455. [[Featured as a spotlight article in Trends in Cognitive Science](#)]

CONFERENCE PUBLICATIONS

Note: In machine learning and artificial intelligence, conferences are competitively peer-reviewed and are the primary archival venue for published work.

Orchinik, R., **Dubey, R.**, Powell, D., Gershman, S., & Bhui, R. (2023). Learning About Scientists from Climate Consensus Messaging. In *Proceedings of the 45th Annual Conference of the Cognitive Science Society*.

Dulberg, Z., **Dubey, R.**, Berwian, I.M., & Cohen, J.D. (2022). Modularity benefits reinforcement learning agents with competing homeostatic drives. In *Proceedings of the 5th Multidisciplinary Conference on Reinforcement Learning and Decision Making*.

Dubey, R., Griffiths, T.L., & Lombrozo, T. (2019). If it's important, then I am curious: A value-based intervention method to induce curiosity. In *Proceedings of the 41st Annual Conference of the Cognitive Science Society*.

Dubey, R., Agrawal, P., Pathak, D., Griffiths, T. L., & Efros, A. A. (2018). Investigating human priors for playing video games. In *35th International Conference on Machine Learning (ICML)*.
[Long oral presentation: 8% acceptance rate]
[See press coverage below]

Mehta, H.*, **Dubey, R.***, & Lombrozo, T. (2018). Your liking is my curiosity: a social popularity intervention to induce curiosity. In *Proceedings of the 40th Annual Conference of the Cognitive Science Society*.

Dubey, R., & Griffiths, T. L. (2017). A rational analysis of curiosity. In *Proceedings of the 39th Annual Conference of the Cognitive Science Society*.

Dubey, R.*, Peterson, J.*, Khosla, A., Yang, M. H., & Ghanem, B. (2015). What makes an object memorable?. In *Proceedings of the IEEE International Conference on Computer Vision (ICCV)*.

Dubey, R., Dave, A., & Ghanem, B. (2014). Improving saliency models by predicting human fixation patches. In *Asian Conference on Computer Vision*.

Dave, A.*, **Dubey, R.***, & Ghanem, B. (2012). Do humans fixate on interest points?. In *21st IEEE International Conference on Pattern Recognition*.

Dubey, R., Ni, B., & Moulin, P. (2012). A depth camera based fall recognition system for the elderly. In *International Conference on Image Analysis and Recognition*

Book Chapters

Soon, C. S., **Dubey, R.**, Ananyev, E., & Hsieh, P. J. (2017). Approaches to understanding visual illusions. In *Computational and cognitive neuroscience of vision*, (pp. 221-233). Springer, Singapore.

Technical Reports

Dubey, R.*, Grant E.*, Luo, M.*, Narasimhan, K., & Griffiths, T. L. (2020). Connecting context-specific adaptation in humans to meta-learning. *arXiv: 2011.13782*

Awards

2021	Princeton Energy and Climate Scholars fellowship
2020	Best reviewer award for the 37 th International Conference on Machine Learning, ICML, 2020 [ranked top 10%]
2020	Best reviewer award for the 34 th conference on Neural Information Processing Systems, 2020 [ranked top 8.5%]
2017	Graduate School of Education Fellowship Award, Block Grant Award
2016	Outstanding Graduate Student Instructor Award, University of California, Berkeley
2016	Marascuilo Fellowship Award
2016	Graduate School of Education Fellowship Award, Block Grant Award

Teaching Experience

PRINCETON

2019	Graduate Student Instructor, COS 360: Computational Models of Cognition (Fall 2019) [Department of Computer Science's nomination for the 2020 Teaching Award]
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UC BERKELEY

- 2018 *Graduate Student Instructor, CogSci 131: Computational Models of Cognition (Spring 2018)*
2016 *Graduate Student Instructor, CogSci 131: Computational Models of Cognition (Fall 2016)*
[Outstanding Graduate Student Instructor Award]
2016 *Graduate Student Instructor, CogSci 1: Introduction to Cognitive Science (Summer 2016)*

Mentoring

- 2023– Grace Liu, masters student in Computer Science, Princeton University
2022– Lucas Irwin, undergraduate in Computer Science, Princeton University
[George A. Miller Thesis Award in Cognitive Science]
2022– Nikolay Sukhov, PhD student in Physics, Princeton University
2021– Zachary Dulberg, PhD student in Neuroscience, Princeton University
2022– Dhara Kumari Yu, masters student in CS, Stanford → PhD student in Psychology, UC Berkeley
2021–22 Yosi Hatekar, undergraduate in Computer Science, University of Toronto
2021–22 Ayush Chakravarty, undergraduate in CS, UC Davis → M.S. student in Symbolic Systems, Stanford
2020–21 Michael Luo, undergraduate in Computer Science, UC Berkeley → PhD student, UC Berkeley
2020–21 Jean Luo, undergraduate in Psychology, Princeton University → PhD student, USC
2020–21 Nimra Nadeem, undergraduate in Computer Science, Princeton University
2017–19 Hermish Mehta, undergraduate in EECS, UC Berkeley
2017–18 Madeleine Lee, undergraduate in Psychology, UC Berkeley

Invited Talks

- 2023 Department of Psychology Colloquium, University of California, San Diego
Department of Psychology Colloquium, Georgia Institute of Technology
Departments of Computer Science and Psychology Colloquium, University of British Columbia
Department of Communication Colloquium, University of California, Los Angeles
Computational Psychiatry Journal Club, Max Planck Institute for Biological Cybernetics
Symposium on Insight, Society for the Neuroscience of Creativity
Department of Psychology Colloquium, University of California, Berkeley
Causality in Cognition Lab, Stanford University

2022 Consciousness and AI seminar, Future of Humanity Institute, University of Oxford
Symposium on Intrinsic Rewards, Society for Neuroeconomics
Concepts and Categories (ConCats) Seminar, NYU

2021 Climate Psychology and Action Lab, University of California, San Diego
PDP seminar, Princeton University
Schulz lab, Max Planck Institute for Biological Cybernetics, Tübingen, Germany
Active Child workshop, University of Göttingen, Germany

2020 Affective Brain Lab seminar, UCL
2019 PDP seminar, Princeton University Princeton Alumni Association Club

Kidd Lab, University of California, Berkeley
Graduate Cognitive Science Seminar, University of Rutgers, New Brunswick
Curiosity, Explanation, & Exploration Workshop, Princeton University

2018 Cognition Colloquium, University of California, Berkeley

Media coverage

Press related to work on multiple selves.

Media Coverage: [Psychology Today](#), [Tech Xplore](#), [Princeton News](#)

Press related to work on happiness and machine learning.

DailyMail (UK): [Our brains are programmed to keep wanting more](#)

Medical News Today: [Humans desire to want more may serve an important purpose](#)

Neurologica: [The Psychology of FOMO](#)

Phys Org: [RL-based simulations show human desire to always want more may speed up learning](#)

Radio interview: [Deutschlandfunk \(German\)](#)

This study was also featured as the top post on [reddit r/science](#)

Press related to work on curiosity.

BBC: [Curiosity: the neglected trait that drives success.](#)

The British Psychological Society: [To stimulate curiosity in a topic, explain how it benefits society](#)

Press related to work on human priors and artificial intelligence.

Media Coverage: [MIT Technology Review](#), [HiTech News](#), [Import AI](#)

Expository articles and videos: [Arxiv Insights](#), [Two Minute papers](#), [Severely Theoretical](#)

In other languages: [Polish](#), [German](#)

Ad Hoc Reviewing

Journal: Trends in Cognitive Science, Nature Human Behavior, Psychological Review, Cognition, Cognitive Science, Memory and Cognition, Cognition and Emotion, Journal of Artificial Intelligence Research, Transactions in Image Processing

Conference proceedings: Neural Information Processing Systems, International Conference on Machine Learning, International Conference on Learning Representations, Cognitive Science Society

Conference Service

Organizer “Combating the climate crisis with cognitive science” workshop, CogSci 2021.

Panelist “Object Representations for Learning and Control” workshop, NeurIPS 2021.

Co-organizer “Curiosity, Explanation, and Exploration” workshop, Princeton 2019.

Diversity, equity, & inclusion

Editor, Application Statement Feedback Program (2022-)

Member of Divest MIT, Divest Princeton, Citizens Climate Lobby, and Food & Water watch

Volunteer scientist, Skype A Scientist (2021-)

Volunteer software developer, CareGiver Saathi (2021)

[Developed an app with the NGO to locate oxygen, medicines, and beds during India’s worst COVID wave.]

[My app was used by over 10,000 people to find critical life-saving resources during this period.]

Founder and Team lead, Zero Waste Princeton (2019-21)

[Led a group of 30+ students to research and develop strategies to reduce Princeton’s food & plastic waste.]

Research Consultant, Yellowstone Ecological Research Center (2019-21)

References

Dr. Thomas L. Griffiths

Henry R. Luce Professor of Information Technology, Consciousness and Culture

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Dr. Peter Dayan

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Department of Computational Neuroscience, Max Planck Institute for Biological Cybernetics

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Dr. Jonathan D. Cohen

Robert Bendheim and Lynn Bendheim Thoman Professor in Neuroscience

Princeton Neuroscience Institute, Princeton University

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