Rachit Dubey

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Academic Appointments

July 2025– Assistant Professor, Department of Communication, UCLA

2024– Postdoctoral Research Fellow, Department of Computer Science, Princeton University

2023–24 Postdoctoral Research Fellow, MIT Sloan School of Management

Education

2018–23 Ph.D. in Computer Science, Princeton University
Dissertation title: *The successes and failures of human drives*

2015–18 M.S. in Education, University of California, Berkeley

2008– 12 B.Eng. in Computer Science, Nanyang Technological University, Singapore

Awards

2024 The 2024 Society for the Neuroscience of Creativity Dissertation Award
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

Research Interests

General Areas: Computational Cognitive Science, Cognitive Psychology, Artificial Intelligence

Application Areas: Climate Change, Environmental Policy

Representative Publications

Liu, G., Snell, J., Griffiths, T.L., & **Dubey, R.** (in press). Binary climate data heightens perceived impact of climate change. *Nature Human Behavior.* (preprint)

Dubey, R., Hardy, M., Griffiths, T.L., & Bhui R. (2024). AI-generated visuals of car-free US cities help improve support for sustainable policies. *Nature Sustainability*, 7(4), 399-403. [paper]
Featured in Bloomberg, Washington Post, MIT Sloan Ideas Made to Matter

Dulberg, Z., **Dubey, R.,** Berwian, I., & Cohen, J. (2023). Having "multiple selves" helps learning agents explore and adapt in complex changing worlds. *PNAS* (paper)
Featured in Psychology Today, Princeton News, Tech Xplore

Dubey, R., Griffiths, T.L, & Dayan, P. (2022). The pursuit of happiness: A reinforcement learning perspective on habituation and comparisons. *PLOS Computational Biology* (paper)

Featured in Vox, Phys.Org, Neurologica, Deutschlandfunk, National Geographic

Dubey, R. & Griffiths, T.L. (2020). Reconciling novelty and complexity via a rational analysis of curiosity. *Psychological Review* (paper)

Featured as a **spotlight article** in Trends in Cognitive Science

Published Articles

20. Liu, G., Snell, J., Griffiths, T.L., & **Dubey, R.** (in press). Binary climate data heightens perceived impact of climate change. *Nature Human Behavior.* (preprint)

19. Orchinik, R., **Dubey, R.,** Gershman, S., Powell, D., & Bhui, R. (2024). Learning from and about scientists: Consensus messaging shapes perceptions of climate change and climate scientists. *PNAS Nexus*, 3(11), page485 [link]

18. Bhui R. & **Dubey, R.** (2024). Why context should matter. *Decision*, 11(4), 557–567 [link]

17. **Dubey, R.,** Hardy, M., Griffiths, T.L., & Bhui R. (2024). AI-generated visuals of car-free US cities help improve support for sustainable policies. *Nature Sustainability*, 7(4), 399-403. [link]

16. 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. [link]

15. 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.* [link]

14. **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. [link]

13. 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.* [link]

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

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

10. **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. [link]

9. **Dubey, R.** & Griffiths, T.L. (2020). Reconciling novelty and complexity via a rational analysis of curiosity. *Psychological Review*, 127(3), 455. [link]

8. **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.* [link]

7. **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).* [link] [**Long oral presentation: 8%** acceptance rate]

6. 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.* [link]

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

4. **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).* [link]

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

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

1. **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.* [link]

Working Papers

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

3. **Dubey, R.**, Ho, M., Mehta, H., & Griffiths, T.L. (under revision). Aha! moments correspond to metacognitive prediction errors. [preprint]

2. Sukhov, N.*, **Dubey, R.*,** Duke, A., & Griffiths, T.L (under revision). When to keep trying and when to let go: Benchmarking optimal quitting. *Journal of Experimental Psychology: General* [preprint]

1. Dulberg, Z., **Dubey, R.,** & Cohen, J. (under revision). Adapting to loss: A normative account of grief. *Psychological Review* [preprint]

Book Chapters

1. 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

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

Teaching

Princeton

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

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)

Invited Talks

2024 Department of Psychology Colloquium, University of Michigan
Department of Communication Colloquium, University of California, Los Angeles
Summerfield Lab, University of Oxford
School of Informatics Colloquium, University of Edinburgh
School of Sustainability Colloquium, Arizona State University
Department of Psychology Colloquium, Purdue University

2023 Department of Psychology Colloquium, NYU
Climate & Sustainability Consortium, MIT
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 Psychology Colloquium, University of California, Berkeley
Computational Psychiatry Journal Club, Max Planck Institute for Biological Cybernetics
Symposium on Insight, Society for the Neuroscience of Creativity
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, Tubingen, Germany
Active Child workshop, University of Gottingen, Germany

2020 Affective Brain Lab seminar, UCL
PDP seminar, Princeton University

2019 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 using AI to improve support for sustainable policies.

Bloomberg: The images that boost support for sustainable transportation.

Washington Post: How to transform city streets
MIT Sloan Ideas Made to Matter: Sustainable policies get a boost from AI-generated visuals

Press related to work on multiple selves.
Media Coverage: *Psychology Today*, *Tech Xplore*, *Princeton News*

Press related to work on happiness and machine learning.

Vox: How to deal with feelings of not being "good enough"
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*

Reviewing

Journal: Trends in Cognitive Science (x1), Nature Human Behavior (x2), Nature Communications (x1), Psychological Review (x3), Cognition (x5), Cognitive Science (x3), Open Mind (x3), Memory and Cognition (x1), Cognition and Emotion (x1), Journal of Artificial Intelligence Research (x1), Transactions in Image Processing (x1)

Conference proceedings: Neural Information Processing Systems (x3), International Conference on Machine Learning (x3), International Conference on Learning Representations (x3), Cognitive Science Society (x4)

Conference Service

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

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

Service

Editor, Application Statement Feedback Program (2022-)

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)