

Debbie M. Yee

Curriculum Vitae

October 2022

Contact

Cognitive, Linguistic, & Psychological Sciences
Brown University
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Providence, RI, 02906

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Education and Training

2019- Postdoctoral Research Fellow, Brown University
Advisors: Amitai Shenhav (Primary), Laura Stroud (Secondary)
2013-2019 Ph.D. in Psychological & Brain Sciences, Washington University in St. Louis
Advisor: Todd Braver
2013-2015 M.A. in Psychological & Brain Sciences, Washington University in St. Louis
2007-2011 B.S. in Brain & Cognitive Sciences, Massachusetts Institute of Technology

Honors and Awards

2022-2024 NIH Advancing Research Careers of Women and PEERs in Brain Science Award
2021-2023 NIH Computational Psychiatry Training Fellowship (T32)
2019 Teaching Citation, Washington University
2019 Mentorship/Collaboration Award, Scientific Research Network on Decision Neuroscience and Aging
2017 Outstanding Teaching Assistant Award, Psychological & Brain Sciences, WashU
2017 Summer School in Social Neuroscience and Neuroeconomics Fellow
2016 Kavli Summer Institute for Cognitive Neuroscience Fellow
2015, 2017 Reinforcement Learning & Decision-Making Student Travel Fellowship
2017-2019 NIH National Research Service Award Pre-Doctoral Fellowship (F31)
2016 NIH Aging and Development Training Fellowship (T32)
2014-2016 NIH Cognitive, Computational & Systems Neuroscience Training Fellowship (T32)
2014, 2015 National Science Foundation Graduate Research Fellowship, *Honorable Mention*
2010 MIT Undergraduate Research Opportunities Program Direct Funding
2007 Intel Science Talent Search, *Semifinalist*
2005 Siemens Competition, *Semifinalist*

Research Grants (Awarded)

NINDS/NIH – Advancing Research Careers of Women and PEERs in Brain Science Award

Investigating the role of serotonin in aversive motivation and mental effort allocation

Dates: 03/2022–03/2024; Direct Costs: \$25,000

Role: ARC Scholar (on R25-NS124530; MPIs: Lipscombe and Aizenman)

Brown University – Office of the Vice President Research Seed Award

Dissociating neurocomputational mechanisms underlying positive and negative motivations for cognitive effort persistence

Dates: 6/1/2020–6/30/2022; Direct Costs: \$49,000

Role: Co-PI (PI: Shenhav)

Mallinckrodt Institute Radiology/Washington University
Dopaminergic and neural mechanisms of incentive integration and motivated cognitive control
Dates: 12/2017–12/2018; Direct costs: \$22,749
Role: Co-wrote grant, planning/coordinating PET-MR pilot study and data collection (PI: Braver)

NIA/NIH – Scientific Research Network on Decision Neuroscience and Aging Pilot Award
Interactions of motivational incentives and cognitive control in older adult decision-making
Dates: 6/1/2017–8/31/2018; Direct Costs: \$30,000
Role: Subaward PI (on R24-AG054355; PI: Samanez-Larkin)

Research Grants (Submitted)

NIMH/NIH – K99/R00 Pathway to Independence Award
Neurocomputational mechanisms of serotonin, sustained stress, and mental effort allocation
Date Submitted: October 12, 2022

NIMH/NIH – F32 National Research Service Individual Predoctoral Fellowship
Neurocomputational mechanisms of positive and negative outcomes on mental effort allocation
Dates Submitted: December 8, 2019 ; August 8 2020; April 8, 2021 (scored 3x, but not funded)

Recent Preprints / Forthcoming

1. **Yee, D.M.**, Shapiro, K., Braver, T.S. Adolescents integrate the motivational value of monetary and liquid incentives to guide cognitive control allocation.

Publications

*denotes shared authorship

†Project contains OSF directory and can be found here: <https://osf.io/argdf>

1. **Yee, D.M.**, Crawford, J.L., Braver, T.S. (in press). An fMRI Protocol for Scanning with Liquid Incentives in Humans. *STAR Protocols*.
2. †Vilgis, V., ***Yee, D.M.**, Silk, T., Vance, A. (2022). Distinct Neural Profiles of Verbal vs. Spatial Working Memory in Boys with ADHD and Boys with Persistent Depressive Disorder. *Cognitive, Affective, Behavioral Neuroscience*.
3. **Yee, D.M.**, Leng, X., Shenhav, A., Braver, T.S. (2022). Aversive Motivation and Cognitive Control. *Neuroscience and Biobehavioral Reviews*. 133 (104493).
4. Leng, X., **Yee, D.**, Ritz, H., Shenhav, A. (2021). Dissociable influences of reward and punishment on adaptive cognitive control. *PLOS Computational Biology*.
5. †**Yee, D.M.**, Crawford, J.L., Lamichhane, B., Braver, T.S. (2021). Dorsal Anterior Cingulate Cortex Encodes the Integrated Incentive Motivational Value of Cognitive Task Performance. *Journal of Neuroscience*. 41(16):3707-3720.
6. †Crawford, J., **Yee, D.M.**, Hallenback, H.W., Naumann, A., Shapiro, K., Thompson, R.J., Braver, TS. (2020). Dissociable effects of monetary, liquid, and social incentives and cognitive control. *Frontiers in Psychology*.
7. †**Yee, D.M.**, Adams, S., Beck, A., Braver, T.S. (2019). Age-Related Differences in Motivational Integration and Cognitive Control. *Cognitive, Affective, Behavioral Neuroscience*. 19(3):692-714.
8. **Yee, D.M.**, Braver, T.S. (2018). Interactions of Motivation and Cognitive Control. *Current Opinion in Behavioral Sciences*. 19:83-90.
9. †**Yee, D.M.**, Krug, M.K., Allen, A.Z., Braver, T.S. (2016). Monetary and Liquid Incentives Combine to Motivate Cognitive Task Performance. *Frontiers in Psychology*. 6:2037.

10. Solway, A., Diuk, C., Cordova, N., **Yee, D.**, Barto, A., Niv, Y., Botvinick, M.M. (2014). Optimal Behavioral Hierarchy. *PLoS Computational Biology*. 10(8)
11. Blackburne, L.K., Eddy, M., Kalra, P., **Yee, D.**, Sinha, P., Gabrieli, J.D.E. (2014). Neural Correlates of Letter Reversal in Children and Adults. *PLoS ONE*. 9(5)

Book Chapters

1. **Yee, D.M.**, Braver T.S. (2023). Neurocomputational Models of Cognitive Control. In R. Sun (Ed.), *The Cambridge Handbook of Computational Cognitive Sciences*. Cambridge University Press.
2. **Yee, D.M.**, Braver, T.S. (2020). Computational Models of Cognitive Control: Past and Current Approaches. In P. Series (Ed.), *Computational Psychiatry: A Primer* (pp. 83-104). MIT Press.

Manuscripts in Prep

*denotes shared authorship

1. *Prater Fahey, M., ***Yee, D.M.**, Leng, X., Tarlow, M., Shenhav, A., Disentangling influences of aversive motivation on control allocation across distinct motivational contexts.
2. ***Yee, D.M.**, *Hallenbeck, H.W., Thompson, R. Towards an integrative computational model of affect and decision-making: predictions and implications for major depressive disorder.
3. **Yee, D.M.**, Prater Fahey, M., Leng, X., Tarlow, M., Kim, J., Mundy, K., Shenhav, A. Associations between socioeconomic and positive vs. negative motivational influences on mental effort allocation.
4. **Yee, D.M.**, Prater Fahey, M., Leng, X., Tarlow, M., Mundy, K., Shenhav, A. Individual Differences in Anxiety and Depression Predict Distinct Strategies in Mental Effort Allocation

Chaired Conference Symposia

- 2022 *Apr* Neurocomputational Mechanisms of Motivational Influences on Decision-Making
Cognitive Neuroscience Society Meeting. (San Francisco, CA).
 Talk Title: *Reward and aversive motivation influence distinct effort strategies for cognitive control allocation.*

Conference Talks

- 2022 *Jul* Reward and aversive motivation influence distinct effort strategies for cognitive control allocation.
European Society for Cognitive and Affective Neuroscience. (Vienna, AT).
- 2021 *Apr* Psychiatric Symptom Dimensions are Associated with Positive and Negative Influences on Mental Effort. *Society for Affective Science*. (Online)
- 2020 *Mar* Interactions Between Motivation and Cognitive Control in Older Adult Decision-Making. *Scientific Research Network on Decision Neuroscience and Aging Conference*. (Honolulu, HI).
- 2019 *Mar* Neural Mechanisms of Motivational Incentive Integration and Cognitive Control. *Cognitive Neuroscience Society Data Blitz*. (San Francisco, CA).
- 2018 *Nov* Neural mechanisms of motivational integration and cognitive control: Implications for healthy aging. *48th Annual Meeting for the Society for Neuroscience*. (San Diego, CA)

Conference Papers

1. Grahek, I., Leng, X., Prater Fahey, M., **Yee, D.M.**, Shenhav, A. Empirical and Computational Evidence for Reconfiguration Costs during Within-Task Adjustments in Cognitive Control. *Cognitive Science Society*. (Toronto, Canada, July 2022)

2. **Yee, D.M.**, Leng, X., Prater Fahey, M., Tarlow, M., Shenhav, A. Psychiatric Symptom Dimensions are Associated with Positive and Negative Influences on Mental Effort. *Society for Affective Science*. (Online, April 15-17, 2021)
3. Leng, X., Ritz, H., **Yee, DM.**, Shenhav, A. Dissociable influences of reward and punishment on adaptive cognitive control. *Cognitive Science Society*. (Toronto, Canada, July 2020)

Conference Posters

*denotes shared authorship; #denotes trainee

1. *Prater Fahey, M., ***Yee, D.**, Leng, X., Tarlow, M., Shenhav, A. Disentangling influences of aversive motivation on control allocation across distinct motivational contexts. *Reinforcement Learning and Decision Making*. (Providence, RI, July 2022).
2. Grahek, I., Leng, X., Prater Fahey, M., **Yee, D.**, Shenhav, A. Empirical and Computational Evidence for Reconfiguration Costs during Within-Task Adjustments in Cognitive Control. *Cognitive Neuroscience Society Meeting*. (San Francisco, CA, April 23-26, 2022).
3. #Mundy, K., **Yee, D.M.**, Leng, X., Prater Fahey, M., Shenhav, A. Age-Related Differences in the Influence of Positive and Negative Incentives on Mental Effort. *Society for Affective Science Meeting*. (Virtual, April 2022).
4. **Yee, D.M.**, Tarlow, M., Leng, X., Prater Fahey, M., Shenhav, A. Investigating Dissociable Neural Mechanisms of Reward and Penalty Motivation in Mental Effort Allocation. *Symposium for Biology of Decision-Making*. (Online, May 9-12, 2021).
5. Leng, X., Ritz, H., **Yee, D.M.**, Shenhav, A. Dissociable influences of reward and punishment on adaptive cognitive control. *Cognitive Science Society*. (Toronto, Canada, July 2020)
6. Crawford, J.L., **Yee, D.M.**, Lamichhane, B., Di Rosa, E., Braver, T.S. Neural Mechanisms of Motivated Cognitive Control in Older Adults. *Organization for Human Brain Mapping*. (Montreal, Canada, June 26-30, 2020).
7. Leng, X., **Yee, D.M.**, Shenhav, A. Disentangling the influence of positive and negative incentives on cognitive effort. *Cognitive Neuroscience Society*. (Boston, MA, March 14-17, 2020)
8. Leng, X., **Yee D.M.**, Shenhav, A. The influence of positive and negative incentives on cognitive effort persistence. *7th International Symposium on Motivation and Cognitive Control*. (Berlin, Germany, Sept 16-18, 2019).
9. **Yee, D.M.**, Dean Wolf, C.K., Shenhav, A., Braver, T.S. A Hierarchical Drift Diffusion Model of Motivation-Cognitive Control Interactions. *Reinforcement Learning and Decision Making* (Montreal, CA, July 2019).
10. **Yee D.M.**, Braver, T.S. Neural Mechanisms of Motivational Incentive Integration and Cognitive Control. *7th International Symposium on Motivation and Cognitive Control*. (Berlin, Germany, Sept 16-18, 2019).
11. **Yee, D.M.**, Braver, T.S. Neural Mechanisms of Motivational Incentive Integration and Cognitive Control. *Cognitive Neuroscience Society Annual Meeting*. (San Francisco, CA, Mar 22-26, 2019).
12. Nauman, A.N., **Yee, D.M.**, Hallenback, H.W., Thompson, R.J., Braver, T.S. Motivational Integration and Cognitive Control: Dissociable Effects of Monetary, Liquid, and Social Incentives. *Society for Affective Science*. (Boston, MA, March 21-23, 2019).
13. Hallenback, H.W., **Yee, D.M.**, Nauman, A.N., Thompson, R.J., Braver, T.S. Depression and Motivation: Parsing Monetary, Social, and Liquid Incentives. *Society for Affective Science*. (Boston, MA, March 21-23, 2019).
14. Crawford, J.L., **Yee, D.M.**, Braver, T.S. Age-related changes in motivational integration and socio-emotional incentives. Dallas Aging and Cognition Conference. (Dallas, TX, Jan 27-28, 2019)

15. **Yee, D.M.**, Braver, T.S. Neural Mechanisms of Motivational Incentive Integration and Cognitive Control. *Society for Neuroeconomics Annual Meeting*. (Philadelphia, PA, Oct 5-7, 2018)
16. **Yee, D.M.**, Braver, T.S. Neural Mechanisms of Motivational Incentive Integration and Cognitive Control. *Eighth International Symposium on Biology of Decision Making*. (Paris, France, May 24-26, 2018)
17. **Yee, D.M.**, Braver, T.S. Reward and Punishment Effects on the Integration of Monetary and Liquid Incentives on Cognitive Control: Effects of Age. *Cognitive Aging Conference*. (Atlanta, GA, May 3-6, 2018)
18. **Yee, D.M.**, Dean Wolf, C., Braver, T.S. Reinforcement and Punishment Effects on Incentive Integration and Motivated Cognitive Control. *25th Annual Cognitive Neuroscience Society Meeting*. (Boston, MA, March 24-27, 2018)
19. **Yee, D.M.**, Braver, T.S. Reinforcement and Valence Effects on Incentive Integration and Motivated Cognitive Control. *Multi-Disciplinary Conference on Reinforcement Learning and Decision Making*. (Ann Arbor, MI, June 11-14, 2017)
20. **Yee, D.M.**, Adams, S., Weiss, J., Braver, T.S. Motivation-Cognition Interactions in Older and Younger Adults. *Association for Psychological Science*. (Boston, MA, May 25-27, 2017)
21. **Yee, D.M.**, Adams, S., Weiss, J., Braver, T.S. Motivation-Cognition Interactions in Older and Younger Adults. *The Society for Affective Science*. (Boston, MA, April 27, 2017)
22. **Yee, D.**, Braver, T. Monetary and Liquid Incentives Combine to Modulate Cognitive Task Performance. *56th Annual Meeting of The Psychonomic Society*. (Chicago, IL, November 21, 2015)
23. **Yee, D.**, Braver, T. Monetary and Liquid Incentives Combine to Modulate Cognitive Task Performance. *Society for Neuroeconomics Annual Meeting*. (Miami, FL, September 25, 2015)
24. Oksanen, K., **Yee, D.**, Koller, J., Black, K., Braver, T. Applying simultaneous PET/MR to Explore Relationships Between Task-Evoked BOLD Signals and Dopamine. *Organization of the Human Brain Mapping Meeting*. (Honolulu, HI, June 15, 2015).
25. Botvinick, M. M., Diuk, C., **Yee, D.**, Cheong, J., Weinstein, A., Niv, Y. & Barto. A. A general form for state-space representations in frontal and temporal cortex. *44th Annual Meeting of the Society for Neuroscience*. (Washington D.C., November 18, 2014).
26. Solway, A., Diuk, C., Cordova, N., **Yee, D.**, Barto, A., Niv, Y., Botvinick, M. Optimal Task Decomposition. *Multi-Disciplinary Conference on Reinforcement Learning and Decision Making Meeting*. (Princeton, NJ, October 25, 2013).
27. Diuk, C., **Yee, D.**, Ribas-Fernandes, J., Cordova, N., Schapiro A., Niv, Y., Botvinick., M. Divide and Conquer: Task Decomposition in Humans. *42nd Annual Meeting of the Society for Neuroscience*. (New Orleans, LA, October 16, 2012).
28. Blackburne, L.K., Eddy, M., Kalra, P., **Yee, D.**, Del Tufo, S., Sinha, P., Gabrieli, J.D.E. Neural Correlates of Letter Reversal in Children and Adults. *19th Annual Cognitive Neuroscience Society Meeting*. (Chicago, IL, April 2, 2012).
29. Blackburne, L.K., Palti, D., Perea, M., Kim, J., Huang, C., **Yee, D.**, Gabrieli, J.D.E. Attention and Reading Skill Modulate Selectivity of the Left Occipitotemporal Region. *Organization of Human Brain Mapping Meeting*. (Barcelona, Spain, June 6, 2010).
30. Blackburne, L.K., Palta, D., Perea, M., Kim, J., Huang, C., **Yee, D.**, Gabrieli, J.D.E. Functional Connectivity of Left Fusiform to Phonological Processing Regions Increases with Reading Skill. *39th Annual Meeting of the Society for Neuroscience*. (Chicago, IL, October 20, 2009).

Invited Articles

Weston, S.J., Yee, D. Why You Should Become a User: A Brief Introduction to R. *The Observer* (29)3, Association for Psychological Science. (March 2017).

Open Datasets

Etzel, J., Yee, D., Lamichhane, B., Jeffers, M., Di Rosa, E., Crawford, J., An, H., Braver, T. (2018). Multiband Acquisition Dataset. <https://openneuro.org/datasets/ds001399/versions/00002>

Invited Talks

*forthcoming

- 2022 Oct *Cognition, Brain, and Behavior Research Seminar, Harvard University (Cambridge, MA)
- 2022 Oct *Aging Well Lab (PI: Seaman), University of Texas Dallas (Dallas, TX)
- 2022 Jan Neuroscience Research Group, University of Denver (Denver, CO)
- 2021 Oct Cognitive Colloquium, Purdue University (West Lafayette, IN)
- 2021 Sep Cognitive / Cognitive Neuroscience Seminar, University of Michigan (Ann Arbor, MI)
- 2021 Jul Otto Lab Meeting, McGill University (Toronto, CN)
- 2020 Oct Cognitive & Affective Neuroscience Lab (PI: Kensinger), Boston College (Boston MA)
- 2019 Sep Social and Cognitive Seminar, Brown University (Providence, RI)
- 2018 May Cognitive, Computational, and Systems Neuroscience Retreat (St. Louis, MO)
- 2017 Oct Shenhav Lab Meeting, Brown University (Providence, RI)
- 2017 Nov Washington University Neuroscience Retreat (St. Louis, MO)

Teaching Experience and Certifications

- 2019 Completed Teaching Citation at Washington University
- 2014-2017 Co-Instructor, Annual Introductory R & Advanced R workshops
Workshop materials can be found here: <https://debyeeneuro.com/r-tutorials/>
- 2016-2017 Teaching Assistant, Psych 5066 & 5067: Graduate Quantitative Methods I & II
- 2018 Fall Guest Lecturer, Cognitive Neuroscience
- 2019 Spring Guest Lecturer, Advanced Cognitive Neuroscience
- 2022 Spring Guest Lecturer, Maladaptive decision making: circuits and mechanisms

Undergraduate Mentoring

At Washington University in St. Louis

- 2014-2015 Harold Lee (*Mind Brain Behavior*)
- 2015-2016 Jessica Weiss (*Honors Thesis*)
- 2015-2016 Carolyn Dean Wolf (*Independent Study*)
- 2015-2016 Rachel Lilenbaum
- 2015-2018 Katie Shapiro (*Independent Study; SURA Awardee*)
- 2016-2017 Marisa Gong (*Mind Brain Behavior*)
- 2016-2017 Aaditya Manirajan (*Honors Thesis; SURA Awardee*)
- 2017 Sarah Finlay (*visiting student from Dartmouth*)
- 2018 Casey Mason (*SURA Awardee*)
- 2018 Sara Hendrix

At Brown

- 2020- Kaitlyn Mundy (*Honors Thesis; UTRA Awardee*)
- 2021- Sam Nevins

Professional Memberships

Association for Psychological Science • Association for Women in Science • Cognitive Neuroscience Society • Psychonomics • Society for Affective Science • Society for Neuroeconomics • Society for Neuroscience

Organization of Scientific Meetings

2020, 2022 *Organizer*, Growing Up in Aging Neuroscience Symposium, Brown University

Ad Hoc Journal Reviewer

*With Principal Investigator

Neuroscience Brain and Behavioral Sciences • Cognitive Affective & Behavioral Neuroscience • Social Cognitive and Affective Neuroscience • Developmental Cognitive Neuroscience • Frontiers in Human Neuroscience • Journal of Psychiatry & Neuroscience • Neurobiology of Learning and Memory • NeuroImage • Neuroscience and Biobehavioral Review • Scientific Reports • Cerebral Cortex* • Nature Communications* • Journal of Neuroscience*

Psychology Affective Science • Collabra • International Journal of Developmental Sciences • Journal of Experimental Psychology: General • Journal of Gerontology • Motivation and Emotion • Neuropsychologia • PLOS One • Psychological Research • Psychology and Aging • Psychonomic Bulletin & Review • Social and Personality Compass • Quarterly Journal of Experimental Psychology

Additional Training

2020 Carney Computational Modeling Workshop, *Brown University, Providence, RI*
2019 Harmonization Workshop, Scientific Research Network on Decision Neuroscience and Aging, *Miami, FL*
2018 Computational Psychiatry Workshop, *San Diego, CA*
2017 AFNI Bootcamp
2016 Computational Psychiatry Course, *Translational Neuromodeling Unit, Zurich, CH*
2013-2014 Cognitive, Computational, & Systems Neuroscience Pathway, *WUSTL, St. Louis*

University and Community Service

2022- Brown Neuro Cognitive and Systems Neuroscience Journal Club, Co-Organizer
2021 CLPS Dept “How to Join a Research Lab”, *Panelist*
2021- Carney Brain Science External Postdoc Seminar, *Speaker Selection Committee*
2021 CLPS Professional Development Series: The Postdoc, *Panelist*
2020-2021 CLPS Diversity & Inclusion Plan Committee, *Dept Culture Subcommittee Chair*
2017 Washington University NIH Fellowship Writing Workshop Mentor
2015-2018 Cognitive Computational Systems Neuroscience, *Steering Committee*
2014-2016 Psychology Grad Student Association, *Diversity Committee*
2014-2017 Association for Women in Science – St. Louis Chapter, *President*
2011-2018 MIT Educational Counselor (*Regional Chair from 2015-2018*)

Advisory Boards

2022-2027 *Advisory Board Committee*, Scientific Research Network on Decision Neuroscience and Aging (SRNDNA)

Public Outreach

2018 Teen Science Café Network Conference Panel: Understanding the Motivations of Scientist-Presenters, *Panelist* (2018)
2018 Teen Science Cafe, *St. Louis Science Center, Academy of Science STL, Cahokia HS*

Press Releases & Media

“How we decide to love”, *Carney Conversations* (Feb 2022)

“Sum of incentives dictate efforts”, *Washington University Newsroom* (April 2021)

Pre-Doctoral Research Experiences

2011-2013 Research Specialist, Princeton University (PI: Matthew Botvinick)

2009-2010 Research Assistant, Massachusetts Institute of Technology (PI: John Gabrieli)

Other skills

Programming: R (expert), Matlab (expert), bash/tcsh (expert), Python (beginner)

Languages: English (native), French (intermediate, conversational), Chinese (conversational)