DAVID BRAUN

Contact

Email	dave.braun@drexel.edu
Website	davebraun.net
GitHub	github.com/dbraun31
Google Scholar	scholar.google.com

Appointments

Drexel University — Philadelphia, PA
Postdoctoral Fellow — 2023 - Present
- Advisor: Aaron Kucyi

Lehigh University — Bethlehem, PA
Postdoctoral Fellow — 2020 - 2023
- Advisor: Catherine M. Arrington

Education

Lehigh University — Bethlehem, PA
Ph.D. Cognitive Psychology — 2014–2020
- Advisor: Catherine M. Arrington

Stockton University — Pomona, NJ
B.A. Psychology — 2009–2013

Highlighted Skills

Software Dev	Built a general command-line tool to convert EEG, fMRI, and behavioral data to standardized BIDS format (see Github repository).
Methods	EEG preprocessing and analysis (MNE Python), eye tracking (Tobii & Pupil Labs), Amazon Mechanical Turk / Prolific Crowd Sourcing
Analysis	Computational modeling, hierarchical Bayesian and Frequentist modeling (see a worked example in R), logistic regression, Principle Components Analysis, permutation-based cluster analysis, deep neural networks, clustering, ANOVA / t tests.
Computer	R, Python, Stan, LaTex, PsychoPy, JavaScript, E-Prime, Linux shell scripting, HTML / CSS, Excel, SPSS, Adobe Photoshop / Illustrator

Publications

Braun, D., Shareef-Trudeau, L., Rao, S., Cheesebrough, C., Kam, J., Kucyi, A. (2025). Neural sensitivity to the heartbeat is modulated by spontaneous fluctuations in subjective arousal during wakeful rest. *Journal of Neuroscience* (under review). *BioRxiv* https://doi.org/10.1101/2025.03.26.645574.

McAndrew, T., Gibson, G. C., **Braun, D.**, Srivastava, A, & Brown, K. (2024). Chimeric forecasting: An experiment to leverage human judgment to improve forecasts of infectious disease using simulated surveillance data. *Epidemics, 47*, 100756. https://doi.org/10.1016/j.epidem.2024.100756

Bounyarith, T., **Braun, D.**, & Kucyi, A. (2024). Examining the neural bases of spontaneous mental experiences with real-time fMRI. Peer Community in Registered Reports [Stage 1 Registered Report: In-Principle Accepted]. https://osf.io/sd4hu

Kucyi, A., Anderson, N., Bounyarith, T., **Braun, D.**, Shareef-Trudeau, L., Treves, I., ... & Hung, S. (2024). Individual variability in neural representations of mind wandering. *Network Neuroscience, 8*, 808-856. https://doi.org/10.1162/netn_a_00387.

McAndrew, T., Gibson, G. C., **Braun, D.**, Srivastava, A. & Brown, K. (2024). Chimeric Forecasting: An experiment to leverage human judgment to improve forecasts of infectious disease using simulated surveillance data. *Epidemics, 47*, 100756. https://doi.org/10.1016/j.epidem.2024.100756.

Mittelstadt, V., Mackenzie, I. G., **Braun, D.**, & Arrington, K. (2024). Reactive and proactive control processes in voluntary task choice. *Memory and Cognition, 52*, 419-429. https://doi.org/10.3758/s13421-023-01470-y

McAndrew, T., Codi, A., Cambeiro, J., Besiroglu, T., **Braun, D.**, Chen, E., Enrique Urtubey de Césaris, L., Luk, D. (2022). Chimeric forecasting: Combining probabilistic predictions from computational models and human judgment. *BMC Infectious Diseases, 22*, 1-17. https://doi.org/10.1186/s12879-022-07794-5.

Braun, D. A., Ingram, D., Ingram, D., Khan, B., Marsh, J., & McAndrew, T. (2022). Crowdsourced perceptions and COVID-19: Improving computational forecasts of US national incident cases of COVID-19 with crowdsourced perceptions of human behavior. *JMIR Public Health Surveill, 8, 1-18.* http://dx.doi.org/10.2196/39336

Codi, A., Luk, D., **Braun, D. A.,** Cambeiro, J., Besiroglu, T. Chen, E., Enrique Urtubey de Cesaris, L., Bocchini, P., McAndrew, T. (2022). Aggregating human judgment probabilistic predictions of COVID-19 transmission, burden, and preventative measures. *American Journal of Public Health.* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9016644/

McAndrew, T., Majumder, M. S., Lover, A. A., Venkatramanan, S., Boccini, P., Besiroglu, T., Codi, A., **Braun, D. A.,** Dempsey, G., Abbott, S., Chevalier, S., Bosse, N. I., Cambeiro, J. (2022). Human judgment forecasts of human monkeypox transmission and burden in non-endemic countries. *Lancet Digital Health.* https://doi.org/10.1016/S2589-7500(22)00127-3

Marvel, C. J., Bates, J. E., Hambric, C. E., **Braun, D. A.**, Arrington, C. M., & Harmer, M. P. (2021). The Lehigh Presidential Nano-Human Interface Initiative: Covergence of materials and cognitive sciences. *MRS Bulletin.* https://doi.org/10.1557/s43577-021-00232-y

Braun, D. A. & Arrington, C. M. (2018). Assessing the role of effort and reward in task selection using a reward-based voluntary task switching paradigm. *Psychological Research*, 82, 54-64. https://doi.org/10.1007/s00426-017-0919-x

Fleck, J. I. & **Braun, D. A.** (2015). The impact of eye movements on a verbal creativity task. *Journal of Cognitive Psychology*, 27, 866-881. https://doi.org/10.1080/20445911.2015.1036057

Doctoral Dissertation

Braun, D. (2020). The effort economy: Investigating the relationship between effort intensity and effort cost. *Available from Dissertation & Theses Lehigh University; Proquest Dissertations & Theses Global. (2466233177).* https://www.proquest.com/dissertations-theses/effort-economy-investigating-relationship-between/docview/2466233177/se-2?accountid=12043

Funding

Graduate Student Research Grant (CAS): $700	Spring 2019
OPAM Travel Award: $350	Fall 2017
Doctoral Travel Grants for Global Opportunities: $750	Fall 2017
Dean's Summer Award: $5,000	Summer 2016
Strohl Grant: $4,000	Summer 2015

Braun, D., Shareef-Trudeau, L., Rao, S., Chesebrough, C., Kam, J. W. Y., Kucyi, A. (2025). State anxiety modulates the link between neural processing of heartbeats and spontaneous fluctuations in subjective arousal. Poster presented at *Cognitive Neuroscience Society Annual Meeting*, Boston, MA.

Bounyarith, T., **Braun, D.**, Kucyi, A. (2025). Examining the neural bases of spontaneous mental experiences with real-time fMRI. Data Blitz Talk presented at *Cognitive Neuroscience Society Annual Meeting*, Boston, MA.

Major, N., **Braun, D.**, Arrington, C. (2024). Security choice task: Balancing effort and concern in password selection. Poster presented at the annual meeting of the Psychonomic Society, New York, NY.

Braun, D., Shareef-Trudeau, L., Rao, S., Kucyi, A. (2024). A personalized approach to studying the subejctive experience of spontaneous thoughts using PCA and hierarchical clustering. Poster presented at Drexel's College of Arts and Sciences Research Day, Philadelphia, PA.

Braun, D., Arrington, C. M. (2022). Effort is relatively costly: Evidence for reference-dependent effort costs. Poster presented at the annual meeting of the Psychonomic Society, Boston, MA.

Major, N., **Braun, D.**, Spencer, E., Marvel, C., Arrington, C. M. (2022). Searching for boundaries: A novel visual search task. Poster presented at the annual meeting of the society for Object Perception, Visual Attention, and Visual Memory, Boston, MA.

Braun, D., Ingram, D., Ingram, D., Khan, B., Marsh, J., McAndrew, T. (2022, September). Incorporating crowdsourced perceptions of human behavior into computational forecasts of U.S. national incident cases of COVID-19. Poster presented at the annual meeting of the Modeling of Infectious Disease Agent Study (MIDAS) network, Boston, MA.

Braun, D. & Arrington, C. M. (2021, November). Effort economy: Investigating the relationship between effort intensity and effort cost. Poster presented at the annual meeting of the Psychonomic Society, online.

Braun, D. & Arrington, C. M. (2018, November). Every person has a price: How do individual differences in switch costs influence the ability to pursue reward while multitasking? Poster presented at the annual meeting of the Psychonomic Society, New Orleans, LA.

Braun, D. & Arrington, C. M. (2017, November). Perceiving the rewarded reality: How incentives influence perception of objects in reward-based voluntary task switching. Poster presented at the annual meeting of the society for Object Perception, Visual Attention, and Visual Memory.

Arrington, C. M. & **Braun, D.** (2017, September). Voluntary task switching in context: The role of higher-level task instructions on task selection processes. Oral presentation at the European Society of Cognitive Psychology, Potsdam, Germany.

Braun, D. & Arrington, C. M. (2017, September). A cost-benefit mechanism underlying task selections in reward-based voluntary task switching (rVTS). Poster presented at the European Society of Cognitive Psychology, Potsdam, Germany.

Braun, D. & Arrington, C. M. (2017, March). The value of knowing when to switch: The influence of cognitive control on goal-driven behavior. Poster presented at the International Convention of Psychological Science, Vienna, Austria.

Braun, D. & Arrington, C. M. (2016, November). The value of knowing when to switch: Investigating the interaction of value and control. Poster presented at the annual meeting of the Psychonomic Society, Boston, MA.

Braun, D., Weaver, S., Arrington, C. M., Reiman, K., & Wylie, G. (2016, March). Sequence complexity and context: The role of expectation in planning and execution of task sequences. Poster presented at the annual meeting of the Cognitive Neuroscience Society, New York, NY.

Arrington, C. M., **Braun, D.**, & Reiman, K. M. (2015, November). Bottom-up and top-down effects of visual attention on task selection during voluntary task switching. Oral presentation at the annual meeting of the Psychonomic Society, Chicago, IL.

Braun, D., & Arrington, C. M. (2015, November). Raising the value of task switching: Task selection and performance under variable reward structures during voluntary task switching. Poster presented at the annual meeting of the Psychonomic Society, Chicago, IL.

Reiman, K. M., **Braun, D.**, & Arrington, C. M. (2015, March). Choosing to look or looking to choose: Eye tracking in voluntary task switching. Poster presented at the inaugural International Convention of Psychological Science, Amsterdam, The Netherlands.

Braun, D. & Arrington, C. M. (2015, March). Strategic switching: Reward structure influences selection in a dynamic decision making environment. Oral presentation at the annual meeting of the Eastern Psychological Association, Philadelphia, PA.

Braun, D., Fleck, J. I., Moench, E., & Ford, J. (2013) The effect of bilateral and unilateral eye-movements on creative thought. Poster presented at the annual convention of the Association for Psychological Science, Washington DC.

Colloquia Presentations

Braun, D. (2025, Spring). Introduction to Machine Learning. Guest lecture given to Research Methods II (Master's level). Drexel University.

Braun, D. (2024, Fall). Memory overview and short term memory. Guest lecture given to Cognitive Psychology (Undergraduate course). Drexel University.

Braun, D. (2022, Fall). Effort is relatively costly: Prospect theory and evidence for reference-dependent effort costs. Invited talk given to the laboratory of Amitai Shenhav at Brown University.

Braun, D. (2022, Spring). Open science: Transparency, reproducibility, integrity. Presentation to Institute for Data, Intelligent Systems, and Computation, Lehigh University.

Braun, D. (2022, Spring). The effort economy: Follow up investigations on a strange phenomenon. Presentation to Psychology Cognition and Language Meeting Group. Lehigh University.

Braun, D. (2019, Spring). Keeping it simple: Investigating how reward is processed during motivated allocation of cognitive control. Presentation to Psychology Department Brown Bag Colloquium, Lehigh University.

Braun, D. (2018, Fall). Sensitive switchers: Are people sensitive to their switch costs when making choices in Rewarded Voluntary Task Switching? Presentation to Cognition and Language Meeting Group. Lehigh University.

Braun, D. & Ungson, N. D. (2017, Fall). Pre-Registration and Open Science Framework: What is it? Who is it? Why is it? Where is it? Presentation to Psychology Department Brown Bag Colloquium, Lehigh University.

Braun, D. (2016, Fall). The value of knowing when to switch: The influence of cognitive control on goal-driven behavior. Presentation to Psychology Department Brown Bag Colloquium, Lehigh University.

Braun, D. (2016, Spring). Should I stay or should I go: Investigating the task specific nature of reward sensitivity when making task selections. Presentation to Psychology Department Brown Bag Colloquium, Lehigh University.

Braun, D. (2015, Fall). The neural effort engaged during encoding of planned action sequences: An fMRI investigation. Presentation to Cognition and Language Meeting Group, Lehigh University.

Braun, D. (2015). Strategic switching: Reward structure influences selection in a dynamic decision making environment. Presentation to Psychology Department Brown Bag Colloquium, Lehigh University.

Braun, D. (2014, Spring). Eye Movements and Creativity. Presentation to Cognition and Language Meeting Group, Lehigh University.

TEACHING EXPERIENCE

Population Health Data Science Algorithms Lab   Spring 2022
Head Instructor

Participant Pool Coordinator   Spring 2020
Graduate Assistant

Statistical Analysis of Behavioral Data   Spring 2019
Teaching Assistant

Statistical Analysis of Behavioral Data   Fall 2018
Teaching Assistant

Research Methods   Spring 2018
Teaching Assistant

Cognitive Psychology   Fall 2017
Teaching Assistant

Cognitive Neuroscience   Summer 2017
Head Instructor

Cognitive Neuroscience   Spring 2017
Teaching Assistant

Human Neuroscience   Fall 2016
Teaching Assistant

Experimental Methods and Lab   Spring 2016
Teaching Assistant

Cognitive Psychology   Fall 2015
Teaching Assistant

Statistical Analysis of Behavioral Data   Spring 2015
Teaching Assistant

Introduction to Psychology   Fall 2014
Teaching Assistant

PROFESSIONAL SERVICE

Drexel University Department of Psychological and Brain Sciences   Summer 2024
Reviewed NSF GRFP submissions for graduate students

Journal of Experimental Psychology: General   Summer 2023
Ad Hoc Reviewer

Journal of Cognition   Fall 2020
Ad Hoc Reviewer

Cognition and Emotion   Fall 2017
Ad Hoc Reviewer

Psychological Research   Fall 2016
Ad Hoc Reviewer

EPA Annual Conference Fall 2016
Submission Reviewer

PLOS One Spring 2016
Reviewer

EPA Annual Conference Fall 2015
Submission Reviewer

Lehigh University Graduate Student Senate Fall 2015–Spring 2016
Unit Representative

LVAIC Undergraduate Psychology Conference Spring 2015
Poster Session Coordinator

Fellowships

Participant July 29 - August 9, 2024
[Neurohackademy](#) *Remote*
- Selected (15% acceptance rate) among 400 scientists to participate in a two-week summer school on neuroimaging and data science, involving hands-on lectures on topics such as reproducibility, analysis of event-locked timeseries data, and designing libraries in Python. Completed a group-based project predicting self-reported emotional state from brain data (with HCP dataset) using machine learning.

Participant July 10 - July 28, 2023
[Neuromatch: Computational Neuroscience](#) *Remote*
- Participated in a three-week workshop using Python programming to practice topics such as machine learning, dynamical systems, and stochastic processes.

Data Science Fellow September 2019–November 2019
[The Data Incubator](#) *New York, NY*
- Selected ($< 2\%$ admittance rate) among 3000+ scientists and engineers with advanced degrees for skills in statistics, data analysis, and programming to participate in a rigorous, eight-week data science fellowship.

Research Assistant Summers 2015 & 2016
[The Kessler Foundation](#) *West Orange, NJ*
- Scheduled, administered informed consent, and collected fMRI data from participants in a research hospital setting. Programmed R scripts to streamline efficiency of data processing.

Media Coverage

The Brown and White, Lehigh University Spring 2022
[A peek into Lehigh research: Developing metal superalloys](#) *Bethlehem, PA*

Community & Leadership

Volunteer November 2020 – September 2023
[One Earth Sangha](#): A Buddhist response to climate crisis. *Remote*
- Facilitating EcoDharma teachers by outlining areas of confusion around climate crisis.
- [Conducted interview](#) with mindfulness teacher on how to skillfully have conversations around climate crisis.

Founder and Instructor Fall 2016–Fall 2017
A workshop to teach graduate students how to use R to analyze data. *Lehigh University*
- Drafted materials and exercises for a semester-long introduction to the R programming language.