

MICHAEL C. FREUND

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EDUCATION

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- Ph.D. in Cognitive Neuroscience**, Washington University in St. Louis (WUSTL) **2017–2023**
• [Cognitive, Computational, and Systems Neuroscience](#) and [Quantitative Data Analysis](#) tracks
- B.A.s in Psychology and Zoology**, University of Wisconsin–Madison (UW–Madison) **2013**

RESEARCH EXPERIENCE

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- Post-Doctoral Associate**, Brown University, *Cogn., Ling. & Psych. Sciences* (PI: [Dr. David Badre](#)) **2023–Present**
- Graduate Student Researcher**, WUSTL, *Psychological & Brain Sciences* (PI: [Dr. Todd Braver](#)) **2017–2023**
- Research Assistant**, Johns Hopkins University, *Neurology* (PI: [Dr. Nazbanou Nozari](#)) **2014–2017**
- Undergraduate Research Assistant**, UW–Madison, *Psychology* (PI: [Dr. Bradley Postle](#)) **2011–2013**
- Undergraduate Research Assistant**, UW–Madison, *Harlow Primate Laboratory* **2012**

PUBLICATIONS

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- 2024** **Freund, MC**, Chen, R, Chen, G, and Braver, TS *bioRxiv*
[Complementary benefits of multivariate and hierarchical models for identifying individual differences in cognitive control](#)
- Freund, MC** and Braver, TS *The SAGE Handbook of Cognitive and Systems Neuroscience*
[Neurocomputational Models of Task Representation \(Ch. 29\)](#)
- 2022** Etzel, JA, Brough, RE, **Freund, MC**, ..., Braver, TS *Scientific Data*
[The Dual Mechanisms of Cognitive Control dataset, a theoretically-guided within-subject task fMRI battery](#)
- 2021** Braver, TS, Kizner, A, Tang, R, **Freund, MC**, Etzel, JA *Journal of Cognitive Neuroscience*
[The Dual Mechanisms of Cognitive Control Project](#)
- Freund, MC**, Etzel, JA, Braver, TS *Trends in Cognitive Sciences*
[Neural coding of cognitive control: The representational similarity analysis approach](#)
- Freund, MC**, Bugg, JM, Braver, TS *Journal of Neuroscience*
[A Representational Similarity Analysis of Cognitive Control during Color-Word Stroop](#)
- 2018** **Freund, MC** and Nozari, N *Cognition*
[Is adaptive control in language production mediated by learning?](#)
- 2016** Nozari, N, **Freund MC**, Breining, B, Rapp, B & Gordon, B. *Language, Cognition, and Neuroscience*
[Cognitive control during selection and repair in word production](#)

TALKS

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- 2022** **Freund, MC** and Braver, TS *Psychonomics (NYC, USA)*
[Symposium talk] [Complementary benefits of multivariate and hierarchical models for identifying individual differences in cognitive control](#)
- 2022** **Freund, MC** and Braver, TS *Society for Neuroscience (San Diego, CA)*
[Nanosymposium talk] [Searching for the neural correlates of history-driven control with EEG decoding](#)
- Freund, MC** and Braver, TS *Control Processes (remote conference)*
[Datablitz] [Examining the psychometrics of control-related fMRI activity in frontoparietal cortex](#)
- Freund, MC** *Arizona State University Psych. Dept. (remote)*
[Invited tutorial] [An Introduction to Representational Similarity Analysis \(with Examples in Cognitive Control\)](#)
- 2019** **Freund, MC**, Braver, TS *Cognitive Neuroscience Society (San Francisco, CA)*
[Accepted datablitz] [A pattern-similarity analysis approach to cognitive control in color-word Stroop](#)

2016 Freund, MC and Nozari, N
[Accepted talk] Online regulation of language production

Psychonomics (Boston, MA)

Freund, MC and Nozari, N
[Accepted talk] Conflict-based regulation of control in language production

Cognitive Science Society (Philadelphia, PA)

SELECTED POSTERS

2024 Society for Neuroscience (Chicago, USA): *Shapes of rule structures learned under different gating policies*

2022 Org. Human Brain Mapping (Glasgow, UK): *Studying neural representations that support flexible distractor resistance*

2020 Org. Human Brain Mapping (remote): *A pattern-similarity analysis approach to cognitive control in color-word Stroop*

2016 International Workshop on Language Production (La Jolla, CA): *Domain-specific control in language production*

AWARDS AND HONORS

Winner of BRAINSTORM Challenge 2024
\$1.5k cash prize awarded to my team for *our project* examining correlates of associative memory encoding in sEEG data, by the Center for Computational Brain Science at Brown Univ.

Dissertation Research Award Winner 2021
\$1k awarded towards dissertation project by WUSTL Psychological & Brain Sciences Department

T32 Fellow 2021–2022
Graduate stipend funded by NIH T32 Award to WUSTL Psychological & Brain Sciences

Cognitive, Computational, and Systems Neuroscience Pathway Fellow 2018–2019, 2020–2021
Graduate stipend funded by the McDonnell Center for Systems Neuroscience at WUSTL

SERVICE AND MENTORSHIP

Undergraduate Student Mentorship

- Kate Scanlan (Soph., Neuroscience & Sociology, Brown) 2023–Present
- Rowen Lee (Soph., Cognitive Neuroscience & Lit. Arts, Brown) 2023–Present
- Avery Schwartz (Sr., Psychology, Neuroscience, & Philosophy, WUSTL) 2021–2022
- Kevin Kotzbauer (Soph., Comp. Eng., WUSTL) 2022
- John Hanrahan (Jr., Psych., Neuro., & Philos.) 2022
- Robert Kimelman (Jr., Math, WUSTL) 2020
- Nicole Costales (Soph., Comp. Eng., WUSTL) 2020
- Matt Witzerman (Jr., Comp. Eng., WUSTL) 2019–2020

Peer Reviewer

2019–Present

- National Science Foundation Proposals (1, 2024); Nature Neuroscience (1); eLife (3); Journal of Neuroscience (3); Cognitive, Affective, & Behavioral Neuroscience (1); Neuroimage (1, pre-2023); Cerebral Cortex (1); Psychological Review (2); Cognition (1); Frontiers in Neuroimaging (1); Human Brain Mapping (2); Psychonomic Bulletin & Review (3); Perspectives on Psychological Science (1)

Cognitive, Computational, and Systems Neuroscience Pathway

2020–2022

Retreat Planning Committee Member

WUSTL

- Invited speakers for and led activities during a yearly research retreat.

Amazing Brain Carnival

Fall 2017–2023

'Cadaver brain' exhibit leader

STL, MO

- Lead members of public (all ages) through hands-on tours of gross human neuroanatomy.

Peer-Mentor Program

Fall 2013

Mentor

UW–Madison Psychology

- Assisted nine freshman in designing curricula, pursuing research opportunities, and exploring interests in psychology and neuroscience through regular individual and group meetings.

TEACHING

Hierarchical Linear Models

Teaching Assistant

Fall 2019

WUSTL

- On hierarchical (i.e., mixed-effect, multi-level) modeling; theory and implementation in R

Select Topics in Statistics

Teaching Assistant

Spring 2019

WUSTL

- On generalized linear models, resampling (permutation, bootstrap) methods, imputation, G-theory, item-response theory

COMPUTATIONAL AND PROGRAMMING SKILLS

Math and statistics	advanced Linear & Hierarchical Models, Modern Multivariate Statistics intermediate Linear Algebra, Calculus introductory Dynamical Systems, Recurrent Neural Networks
Languages, development	advanced R (base, tidyverse, data.table), intermediate Python (NumPy, Scikit-learn, pandas), MATLAB, shell, git, novice Julia, C++
Neural data analysis	tools AFNI, fMRIPrep, Nipy (nipy, nibabel, Nilearn), BrainIAK, MNE, techniques multivariate analysis of EEG and fMRI (decoding, encoding, RSA), fMRI timeseries models, ERP and EEG time-frequency analysis
Report generation	knitr/Sweave/RMarkdown, Jupyter, L ^A T _E X