Benjamin Lipkin

Curriculum Vitae
October 2021

Contact:

Mail	361 Washington St, Apt 1L, Cambridge, MA, 02139
Phone	(347) 306 – 5359
Email	lipkinb@mit.edu
Web	benlipkin.github.io

Education:

2016 – 2020 University of Michigan, Ann Arbor, MI

Degree: B.Sc. Neuroscience, High Honors
Informal Concentration: Computation & Cognition
Thesis: Decoding object color binding using multivariate pattern analysis.
Advisor: Dr. David Brang, PhD.

2012 – 2016 Bronx High School of Science, Bronx, NY

Research:

2020 – Present Fedorenko Lab, MIT, Cambridge, MA (full-time)

Working on a wide variety of projects using neuroimaging, behavioral and corpus analytic approaches, and computational modeling to investigate the neural representations and computations underlying language and other hierarchically structured processes in the human brain and in state-of-the-art deep learning models. Developed software along these goals using primarily Python, MATLAB, and R, among other tools.

2018 – 2020 Brang Lab, University of Michigan, Ann Arbor, MI (part-time + summer)

Processed and analyzed intraoperative electrocorticographic (ECoG) data from epilepsy and tumor patients to investigate articulation network dynamics and organization. Collected and analyzed fMRI data to assess predictive coding of visual information. Assisted in the creation, development, and maintenance of laboratory signal processing, statistical inference, and machine learning pipelines in MATLAB and Python.

2016 – 2018 Becker Lab, University of Michigan, Ann Arbor, MI (part-time + summer)

Carried out behavioral experiments in rats investigating estradiol-mediated modulation of basal ganglia dopamine circuitry during psychostimulant drug

administration. Assisted in animal surgery, immunohistochemistry, and statistical data analysis.

2014 – 2015 Kandel Lab, Columbia University, New York, NY (summer)

Used SDS-PAGE to screen compounds for their effects on the aggregation of RNA binding protein TIA-1 in vitro and in COS-7 cells. Analyzed FRET data to investigate stress granule formation.

Published Manuscripts and Preprints:

2021 Aabedi A*, **Lipkin B***, Kaur J, Kakaizada S, Reihl S, Young JS, Lee AT, Krishna S, Chang EF, Brang D, Hervey-Jumper SL. (in press). Functional alterations in cortical processing of speech in glioma-infiltrated cortex. *PNAS*. https://www.biorxiv.org/content/10.1101/2021.05.14.444263v1

2021 Malik-Moraleda S, Cucu T, **Lipkin B**, Fedorenko, E. (in press). The domain-general Multiple Demand system is more active in bilinguals than monolinguals during executive processing. *Neurobiology of Language*.

2021 Aabedi A, **Lipkin B**, Young JS, Krishna S, Kakaizada S, Kaur J, Berger M, Brang D, Hervey-Jumper SL. (2021). Spectro-temporal encoding of speech responses in glioma-infiltrated cortex. *Journal of Neurosurgery*, 132(2).

Manuscripts in Preparation:

2021 **Lipkin B**, Tuckute G, Affourtit J, Small H, Mineroff Z, Nieto-Castañón A, and Fedorenko E. (in prep). A probabilistic atlas for the Multiple Demand (MD) network based on data from 691 individuals performing a spatial working memory localizer task.

2021 **Lipkin B**, Tuckute G, Affourtit J, Small H, Mineroff Z, Kean H, Jouravlev O, Rakocevic L, Pitchett B, Siegelman M, Hoeflin C, Pongos A, Blank I, Kline M, Ivanova A, Shannon S, Nieto-Castañón A, and Fedorenko E. (in prep). LanA (Language Atlas): A probabilistic atlas for the language network based on data from >800 individuals.

2021 **Lipkin B**, Affourtit J, Small H, Mineroff Z, Nieto-Castañòn A, Fedorenko E. (in prep). In defense of individual-level functional neural markers: Evidence from large-scale fMRI datasets of functional 'localizers' for the language and the Multiple Demand networks.

2021 Regev T*, **Lipkin B***, Boebinger D, Paunov A, Norman-Haignere S, Kanwisher N, Fedorenko E. (in prep). Preserved functional organization of human auditory cortex in individuals missing temporal lobe from birth.

2021 Shain C, Kean H, **Lipkin B**, Affourtit J, Siegelman M, Mollica F, Fedorenko E. (in prep). Constituent length effects do not support syntactic abstraction in the human language network.

2021 Srikant S*, **Lipkin B***, Ivanova A, Fedorenko E, O'Reilly, UM. (under review). Representations of computer programs in the human brain. https://github.com/benlipkin/braincode

Invited Talks:

2020	Aabedi A, **Lipkin B**, Valdivia C. The neural encoding of speech errors in patients with perisylvian brain tumors. Berkeley Phonetics and Phonology Forum, Berkeley, CA.

Conference Presentations and Posters:

2021	Small H*, **Lipkin B***, Affourtit J, Pongos A, Fedorenko E. Differential selectivity of the left and right hemisphere language regions for non-linguistic processing. *Society for Neurobiology of Language.*
2019	**Lipkin B**, Plass J, Kakaizada S, Valdivia C, Sagher O, Hervey-Jumper SL, Brang D. Electrocorticographic recordings enable intraoperative language network mapping. *Society for Neuroscience*, Chicago, IL
2018	Quigley JA, **Lipkin B**, Lalani LK, Becker JB. G-protein coupled estradiol receptor 1 activation regulates drug preference and dopamine release in male rats. *Society for Neuroscience*, San Diego, CA.
2018	Quigley JA, Lalani LK, **Lipkin B**, Becker JB. Effects of ICI 182,780 on preference for cocaine in male rats. *International Behavioral Neuroscience Society*, Boca Raton, FL.

Awards:

2016 – 2020	University Honors.
2019	MCubed Scholars Research Fellowship.
2016	New York City Science & Engineering Fair Finalist.

Volunteer:

2018 – 2019	FEMMES Workshop Volunteer. University of Michigan, Ann Arbor, MI.
2017	Laboratory Tour Volunteer. University of Michigan, Ann Arbor, MI.
2016	Patient Care Volunteer. Eisenhower Center for TBI, Ann Arbor, MI.

Affiliations:

2020 – Present	Society for the Neurobiology of Language (SNL).
2019 – Present	Cognitive Neuroscience Society (CNS).
2018 – Present	Society for Neuroscience (SfN).

Selected Coursework & Technical Experience:

Mathematics	Vector Calculus, Linear Algebra, Differential Equations, Probability
Computer Science	Data Structures & Algorithms, Software Engineering, Machine Learning
Engineering	Dynamic Systems & Control, Signal Processing, Markov Decision Processes
Languages	Python, MATLAB, R, Bash/Zsh, Julia, C++, HTML/CSS, SQL
Libraries	PyTorch, Tensorflow, Scikit-Learn, NiLearn, SPM, Freesurfer

References:

Evelina Fedorenko, Ph.D.
Associate Professor, Brain & Cognitive Sciences
Massachusetts Institute of Technology
43 Vassar Street, Cambridge, MA 02139
evelina9@mit.edu

David Brang, Ph.D.
Assistant Professor, Psychology
University of Michigan, Ann Arbor
530 Church Street, Ann Arbor, MI 48109
djbrang@umich.edu

Shawn Hervey-Jumper, MD.
Associate Professor, Neurological Surgery
University of California, San Francisco
513 Parnassus Ave, San Francisco, CA 94143
Shawn.Hervey-Jumper@ucsf.edu