Joshua Satya Cetron | *Curriculum Vitae*

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Research interests: *computational and multivariate analysis of cognitive neuroimaging data (e.g., RSA, MVPA), neural basis of cognition and learning, applying neuroscience and psychology research to improve social, educational, and public health outcomes.*

Education

Harvard University, Cambridge, MA, *September 2018 - Present*
Doctoral Student, Department of Psychology
Advisor: Mina Cikara, Ph.D.

Dartmouth College, Hanover, NH, *September 2012 - June 2016*
B.A., Neuroscience, High Honors, Minors in Education and Spanish
Summa Cum Laude, Phi Beta Kappa, GPA: 3.92

Publications and Submitted Manuscripts

Cetron, J. S., Connolly, A. C., Diamond, S. G., May, V. V., Haxby, J. V., Kraemer, D. J. M. (2019). Decoding individual differences in STEM learning from functional MRI data. *Nature Communications*, 10(1), 2027. https://doi.org/10.1038/s41467-019-10053-y PDF

Cetron, J. S., Connolly, A. C., Diamond, S. G., May, V. V., Haxby, J. V., & Kraemer, D. J. M. (2019). Decoding individual differences in STEM learning from functional MRI data. Nature Communications,

Cetron, J. S., Connolly, A. C., Diamond, S. G., May, V. V., Haxby, J. V., Kraemer, D. J. M. (2019). Using the force: prior knowledge and experience shape neural representations of engineering concepts. *Submitted*. Preprint available at https://psyarxiv.com/ue5fa. Preprint DOI: 10.17605/OSF.IO/UE5FA.

Alfred, K. L., Hayes, J. H., **Cetron, J. S.**, Pizzie, R. G., Kraemer, D. J. M. (2019). Individual differences in encoded neural representations within cortical speech production network. *Submitted*. Preprint available at https://psyarxiv.com/8wcpv/. Preprint DOI: 10.31234/osf.io/8wcpv.

Current projects

Cetron, J. S. & Cikara, M. (2019). Understanding how opinions become represented as facts (and how to intervene). *In progress.*

Alfred, K. L., Connolly, A. C., **Cetron, J. S.**, Kraemer, D. J. M. (2019). Does the brain have a domain-general mechanism for representing mental models? *Manuscript in preparation.*

Hayes, J. C., Alfred, K. L., **Cetron, J. S.**, Pizzie, R. G., Kraemer, D. J. M. (2019). Individual differences in information processing predict distinct structural connectivity patterns. *Manuscript in preparation.*

Cetron, J. S., Hayes, J.C., Connolly, A. C., Diamond, S. G., May, V. V., Haxby, J. V., Kraemer, D. J. M. (2019). Comparing neural and behavioral representations of engineering concept learning for lab-based and computer-based instructional methods. *In progress.*

Peterson, E. M., Kolvoord, R. A., Kraemer, D. J. M., Weinberger, A. B., Uttal, D. H., Goldman, D., **Cetron, J. S.**, Green, A. E. (2019). A neural test of concept mastery in geoscience through evaluation of neural representations. *In progress.*

Nastase, S. A., Hayes, J. H., **Cetron, J. S.**, Green, A. E., Cross, E. S., Haxby, J. V., Kraemer, D. J. M. (2017). Decoding perceptual retrieval: the influence of retrieval modality and task difficulty. *Manuscript in preparation.*

Other Publications

Cetron, J. S., & Dartmouth College. (2016). *The role of motor regions in representing engineering concepts.* (Senior Honors Thesis). Retrieved from Dartmouth College Library. (Control No. ocn953695823).

Kean, L., Sen, S., Felder, M. A., Tangpricha, V., Adisa, O., JAMES-Herry, A., Buchanan, I., Ziegler, T., Alvarez, J., Beus, J., Worthington-White, D., Robertson, J., George, J., **Cetron, J.**, Ofori-Acquah, S. F., & Osunkwo, I. (2011). Evidence for Quantitative and Functional Immune Deviation in Pediatric Patients with Sickle Cell Disease. *Blood*, 118(21), 1054. Retrieved from http://www.bloodjournal.org/content/118/21/1054.

Conference Presentations

Cetron, J. S., Hayes, J.C., Connolly, A. C., Diamond, S. G., May, V. V., Haxby, J. V., Kraemer, D. J. M. (2019, March). Comparing neural and behavioral representations of engineering concept learning for lab-based and computer-based instructional methods. Poster presented at the 2019 annual meeting of the Cognitive Neuroscience Society, San Francisco, CA.

Cetron, J. S., Connolly, A. C., Diamond, S. G., May, V. V., Haxby, J. V., Kraemer, D. J. M. (2018, March). A neural score for engineering concepts: predicting STEM learning with multivariate pattern analysis of functional neuroimaging data. Poster presented at the 2018 annual meeting of the Cognitive Neuroscience Society, Boston, MA.

Hayes, J. C., Alfred, K. L., **Cetron, J. S.**, Pizzie, R. G., Kraemer, D. J. M. (2018, March). Individual differences in information processing predict distinct structural connectivity patterns. Poster presented at the 2018 annual meeting of the Cognitive Neuroscience Society, Boston, MA.

Alfred, K. L., Connolly, A. C., **Cetron, J. S.**, Kraemer, D. J. M. (2017, March). Does the brain have a domain-general mechanism for representing mental models? Poster presented at the annual meeting of the Cognitive Neuroscience Society, San Francisco, CA.

Cetron, J. S., Connolly, A. C., Diamond, S. G., May, V. V., Kraemer, D. J. M. (2016, May). The role of motor regions in representing engineering concepts. Poster presented at the inaugural meeting of the Psychonomics Society International, Granada, Spain.

Cetron, J. S., Connolly, A. C., Diamond, S. G., May, V. V., Kraemer, D. J. M. (2016, April). The role of motor regions in representing engineering concepts. Poster presented at the annual meeting of the Cognitive Neuroscience Society, New York, NY.

Selected Honors, Awards, & Research Funding

National Science Foundation Graduate Research Fellow
National Science Foundation, 2019 - Present
2019 recipient of the NSF Graduate Research Fellowship award for research program in progress under the title: Understanding how opinions become represented as facts (and how to intervene).

Presidential Scholar, Graduate School of Arts and Sciences
Harvard University, Cambridge, MA, September 2018 - Present
Selected by the Harvard Graduate School of Arts and Sciences to receive the Presidential Scholarship Award in special recognition of a commitment to public service and intellectual excellence. Nominated by the Harvard Department of Psychology.

High Honors Award, Neuroscience Honors Thesis
Dartmouth College, Hanover, NH, June 2016
Senior Undergraduate Neuroscience Honors Thesis awarded High Honors by the Department of Psychological and Brain Sciences.

Citations for Meritorious Performance
Dartmouth College, Hanover, NH, 2014 - 2016
On four unique occasions, received formal personal commendations from faculty for exceptional contributions to an academic course, each in a distinct department. Faculty remarks are recorded on students' official undergraduate transcripts.

James O. Freeman Presidential Scholar
Dartmouth College, Hanover, NH, January 2015 - June 2015
Funded undergraduate research assistantship for two academic terms of research with a faculty mentor. Awarded to third-year student applicants in the top 40% of their class.

Kaminsky Family Fund Award Grant Researcher
Dartmouth College, Hanover, NH, Fall 2014, Summer 2015
Dartmouth College Dean of the Faculty Undergraduate Research Grant recipient, sponsored for two separate academic terms.

Rufus Choate Scholar
Dartmouth College, Hanover, NH, 2012 - 2013, 2013 - 2014
Annual award recognizing students in the top 5% of their class each academic year.

Sophomore Science Scholar
Dartmouth College, Hanover, NH, September 2013 - March 2014
Undergraduate research assistantship for two academic terms with a faculty mentor. Awarded to second-year student applicants conducting research in the sciences.

Skills

Computational Skills
Programming Languages: R, Python (including SciPy and NumPy), Unix (bash), Markdown, Slurm cluster computing, some JavaScript (jsPsych).
Computational Tools & Software: RStudio, iPython, Jupyter, PsychoPy, Git, Atom, Slurm, Qualtrics, jsPsych.

Statistical Skills
Analyses: standard and generalized linear fixed-effects, mixed-effects, and additive modeling, multivariate cluster analysis (standard and bootstrapped hierarchical clustering, density-based clustering), dimensionality reduction (multidimensional scaling, principal components analysis), support vector machine classification.

Neuroimaging Skills
Functional MRI Scanning: Scanner operation and safety training (Philips 3.0 T Achieva Intera, Siemens PRISMA 3T).
Neuroimaging Analysis Tools: AFNI (AFNI bootcamp certified), SUMA, FSL, FreeSurfer, PyMVPA.
Neuroimaging Analysis Procedures: General linear modeling (subject- and group-level), whole-brain searchlight multivariate pattern analysis (MVPA), representational similarity analysis (RSA).

Other Skills
Media Processing: Audio editing, recording, and mastering (Logic Pro X), image manipulation (GIMP), video editing (DaVinci Resolve, Final Cut Express).
Engineering: Electronics soldering, basic circuit wiring, basic woodworking, amateur luthier.
Language Skills: Fluent in Spanish.
Musical Training: 15+ years of musical instrument, independent songwriting, and performance experience.

Research Experience

Doctoral Student, Harvard Intergroup Neuroscience Lab
Harvard University, Cambridge, MA, September 2018 - Present
Advisor: Mina Cikara, Ph.D.

Post-Baccalaureate Researcher and Lab Manager, Cognitive Neuroscience of Learning Lab
Dartmouth College, Hanover, NH, September 2016 - September 2018
Advisor: David J. M. Kraemer, Ph.D.

Undergraduate Research Assistant, Cognitive Neuroscience of Learning Lab
Dartmouth College, Hanover, NH, July 2013 - June 2016
Advisor: David J. M. Kraemer, Ph.D.

Laboratory Intern and Research Assistant, Emory University Transplant Centers
Emory University and Yerkes International Primate Research Center, Atlanta, GA, Summers 2010 - 2012
Advisor: Leslie Kean, M.D./Ph.D.

Additional Work & Leadership Experience

Director, Dartmouth Outing Club (DOC) First-Year Trips Program
Hanover, NH, November 2015 - November 2016

- Directed the 2016 First-Year Trips program for the Dartmouth Outing Club, the largest College outdoor orientation program in the country, designing and overseeing 139 different five-day, student-led trips for approximately 1000 incoming students, which took place across New Hampshire (including in the White Mountains and along sections of the Appalachian Trail).

- Interviewed and hired a 20-person Directorate; selected and managed a student volunteer staff of 350+ (278 trip leaders, 56 support crew members on 6 separate teams) from an applicant pool of 600+.

Program Facilitator, Pearson Seminar on Youth Leadership
Lester B. Pearson United World College of the Pacific, Victoria, B.C., Canada, Summers 2010 - 2011

- Collaborated with a team of 16 facilitators and 8 program coordinators to design and implement a month-long summer leadership program for 100 high school student participants from 20+ different countries. Topics included social justice, global citizenship, environmental sustainability, and community-building.

References

Mina Cikara, Ph.D.
Assistant Professor, Department of Psychology
Harvard University, Cambridge, MA
(617) 495-3819, mcikara@fas.harvard.edu

David J. M. Kraemer, Ph.D.
Assistant Professor, Department of Education
Advisor, Department of Psychological and Brain Sciences, Graduate Program
Dartmouth College, Hanover, NH
(603) 667-0472, david.j.m.kraemer@dartmouth.edu

James V. Haxby, Ph.D.
Evans Family Distinguished Professor, Department of Psychological and Brain Sciences Director, Center for Cognitive Neuroscience
Director, Dartmouth Brain Imaging Center

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