Aaron M. Bornstein

Updated: May 12, 2021

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CURRENT POSITION

2019-   Assistant Professor, Department of Cognitive Sciences
Faculty, Institute for Mathematical Behavioral Sciences
Fellow, Center for the Neurobiology of Learning and Memory
University of California, Irvine

PREVIOUS APPOINTMENTS

2018   Associate Research Scholar, Princeton Neuroscience Institute
2013-2018 Postdoctoral Research Associate, Princeton Neuroscience Institute
2007-2013 PhD candidate, Cognition & Perception, New York University
2006   Research assistant, Deicken lab, UCSF/VA
2005-2007 Research assistant, Wagner lab, Stanford

EDUCATION

2013   Ph.D., Cognition & Perception
New York University
Advisor: Nathaniel D. Daw
2003   S.B., Mathematics (additional concentration in Economics)
Massachusetts Institute of Technology

RESEARCH FUNDING

2021-2023   NIA R21AG072673 (PI Bornstein)
"Improving multi-step planning in aging by overcoming deficits in memory encoding"

2021-2023   BBRF NARSAD Young Investigator award (PI Bornstein)
"Determining the role of episodic memory in substance use disorder"

2020-2021   NIMH P50MH096889 (PI Baram; Sub-PI Bornstein)
"Early life adversity effects on event segmentation"

2011-2013   NIMH F31MH095501 (PI Bornstein)
"Computational mechanisms of goal-directed control"

To trainees

2020-2023   National Defense Science & Engineering Graduate fellowship (Nora Harhen)
2019   UCI Summer Undergraduate Research Fellowship (Brianna Sarcos)

Preprints

PP4 **Bornstein AM**, Aly M, Feng SF, Turk-Browne NB, Norman KA, Cohen JD. Perceptual decisions result from the continuous accumulation of memory and sensory evidence. *bioRxiv*.
doi:10.1101/186817
doi:10.18112/openneuro.ds001614.v1.0.1

PP3 Hunter LE*, **Bornstein AM***, Hartley CA. A common deliberative process underlies model-based planning and patient intertemporal choice. *bioRxiv*.
doi:10.1101/499707

PP2 Rmus M, Ritz H, Hunter LE, **Bornstein AM***, Shenhav A*. Individual differences in model-based planning are linked to the ability to infer latent structure. *bioRxiv*.
doi:10.1101/732072

PP1 Wang S*, Feng SF, **Bornstein AM**. Mixing memory and desire: How decisions for reward depend on the dynamics and content of memory reinstatement. *PsyArXiv*.
doi:10.31234/osf.io/5vksj

Peer-reviewed journal articles

JP11 Rouhani N, Norman KA, Niv Y, **Bornstein AM** (2020). Reward prediction errors create event boundaries in memory. *Cognition*, 203:104269.
doi:10.1016/j.cognition.2020.104269

JP10 **Bornstein AM***, Pickard H* (2020). Chasing the first high: Memory sampling in drug choice. *Neuropsychopharmacology*, 45(6):907-915.
doi:10.1038/s41386-019-0594-2

JP9 Kane GA, **Bornstein AM**, Shenhav A, Wilson RC, Daw ND, Cohen JD (2019). Rats exhibit similar biases in foraging and intertemporal choice tasks. *eLife*, 8:e48429.
doi:10.7554/eLife.48429

JP8 Millner AJ, den Ouden HEM, Gershman SJ, Glenn CR, Kearns J, **Bornstein AM**, Marx BP, Keane TM, Nock MK (2019). Suicidal thoughts and behaviors are associated with an increased decision-making bias for active responses to escape aversive states. *Journal of Abnormal Psychology*, 128(2):106-118.
doi:10.1037/abn0000395

JP7 Hoskin AN, **Bornstein AM**, Norman KA, Cohen JD (2018). Refresh my memory: Episodic memory reinstatements intrude on working memory maintenance. *Cognitive, Affective, & Behavioral Neuroscience*, 19:338-354.
doi:10.3758/s13415-018-00674-z
doi:10.18112/openneuro.ds001576.v1.0.0

JP6 **Bornstein AM**, Khaw MW, Shohamy D, Daw ND (2017). Reminders of past choices bias decisions for reward in humans. *Nature Communications*, 8:15958.
doi:10.1038/ncomms15958

JP5 **Bornstein AM**, Norman KA (2017). Reinstated episodic context guides sampling-based decisions for reward. *Nature Neuroscience*, 20:997-1003.
doi:10.1038/nn.4573
doi:10.18112/openneuro.ds001607.v1.0.1

JP4 **Bornstein AM**, Daw ND (2013). Cortical and hippocampal correlates of deliberation during model-based decisions for rewards in humans. *PLoS Computational Biology*, 9(12):e1003387.
doi:10.1371/journal.pcbi.1003387

JP3 **Bornstein AM**, Daw ND (2012). Dissociating hippocampal and striatal contributions to sequential prediction learning. *European Journal of Neuroscience*, 35:1011-1023.
doi:10.1111/j.1460-9568.2011.07920.x

JP2 **Bornstein AM**, Daw ND (2011). Multiplicity of control in the basal ganglia: computational roles of striatal subregions. *Current Opinion in Neurobiology*, 21(3):374-380.
doi:10.1016/j.conb.2011.02.009

JP1 Preston AR, **Bornstein AM**, Hutchinson JB, Gaare ME, Glover GH, Wagner AD (2010). High-resolution fMRI of content-sensitive subsequent memory responses in human medial temporal lobe. *Journal of Cognitive Neuroscience*, 22:156-173.
doi:10.1162/jocn.2009.21195

Peer-reviewed articles in conference proceedings

CP3 Harhen NC, Hartley CA, **Bornstein AM** (2021). Model-based foraging using latent-cause inference. *Proceedings of the 43rd Annual Conference of the Cognitive Science Society*.
doi:10.31234/osf.io/dfztu

CP2 Kane GA, **Bornstein AM**, Shenhav A, Wilson RC, Daw ND, Cohen JD (2017). Mechanisms of overharvesting in patch foraging. *Proceedings of the 39th Annual Conference of the Cognitive Science Society*, 637-642.

CP1 Floares A, Jakary A, **Bornstein A**, Deicken R (2006). Neural networks and classification and regression trees are able to distinguish females with major depression from healthy controls using neuroimaging data. *Proceedings of the IEEE International Joint Conference of Neural Networks, 2006*, 4605-4611.
doi:10.1109/ijcnn.2006.247090

Commentaries

RP5 **Bornstein AM***, Constantino SM* (2017). Nudge back: Towards a taxonomy of scientific rationalities. *London Conference in Critical Thought*.

RP4 **Bornstein AM**, Miller KJ, Shenhav A (2015). Walking bundles of habits (and Response-Outcome associations). *European Journal of Neuroscience*, 41:1356-1357.
doi:10.1111/ejn.12906

RP3 **Bornstein AM** (2014). Functions of the hippocampal memory system in instrumental control (Doctoral dissertation).
Available from ProQuest Dissertations & Theses Global (3614853).

RP2 Wallisch P, **Bornstein AM** (2013). Enhanced motion perception as a psychophysical marker for autism? *Journal of Neuroscience*, 33(37):14631-14632.
doi:10.1523/jneurosci.2945-13.2013

RP1 **Bornstein AM**, Nylen EL, Steele SA (2011). Unblocking the neural substrates of model-based value. *Journal of Neuroscience*, 31(28):10117-10118.
doi:10.1523/jneurosci.1883-11.2011

2020	Association for Psychological Science "Rising Star" Award
2020	Brain and Behavior Research Foundation NARSAD Young Investigator Award
2014	Spotlight poster, Society for Neuroeconomics annual meeting
2005,6,8	Honorable mention, NSF Graduate Research Fellowship
2000	Runner up, MIT $50k Business Plan competition

Talks

Invited

Feb 2021	University of California Los Angeles
Feb 2021	Context and Affective Memory meeting
Aug 2020	University of California Los Angeles
Mar 2020	Claremont Colleges
Feb 2020	University of California Riverside
Jan 2020	Winter Conference on Learning and Memory
Sep 2019	Facebook Research Labs
May 2019	University of California Los Angeles
Apr 2019	Brown University
Jan 2019	National Institute of Drug Abuse
Dec 2017	Cognition and Brain Sciences Unit, Cambridge University
Oct 2017	Johns Hopkins University
Feb 2015	Mount Sinai School of Medicine
Jun 2014	Weill-Cornell Medical College
Mar 2014	Workshop on the Neurobiology of Prediction and Surprise, Rutgers University
Jan 2011	Parallel Distributed Processing meeting, Princeton University
Jan 2011	Kavli Institute, Harvard University

Contributed

Apr 2021   Society of Biological Psychiatry symposium "Advancing Treatment of Substance Use Disorders Through Computational Modeling"

Jan 2020 Winter Conference on the Neurobiology of Learning and Memory symposium "Mnemonic contributions to reinforcement learning and decision making"

Mar 2018   Cosyne workshop "Hippocampal computations and interactions supporting statistical learning and decision-making"

Nov 2015 SFN symposium "Understanding Goal-Directed Decision-Making in Humans: Computations and Circuits"

Teaching/Service

UC Irvine

Spring 2021 Decision making & Problem solving (Graduate; with Prof. Zygmunt Pizlo)

Spring 2020   Topics in Reinforcement Learning (Graduate; with Prof. Mimi Liljeholm)

Spring 2019-21   Research in Exp Psych (Undergraduate; with Prof. Nadia Chernyak)

Winter 2019-21   Advanced Experimental Psychology (Undergraduate)

Other teaching/mentorship

Fall 2020   Neuromatch academy mentor

Summer 2020   Neuromatch academy group leader

Summer 2020   GSMI Cientifico Latino

2019   MEET alumni mentor

Summer 2018 Computational & Cognitive Neuroscience Summer School, Suzhou, China

2016-2018   Princeton Prison Teaching Initiative

Summer 2007,08 MIT Middle East Education through Technology (MEET), Jerusalem

University service

2021-   Irvine Faculty Association, executive board member

2021   CNLM Spring meeting program co-chair

2021   CogSci Undergraduate Association interview

2020   CNLM "Evening to Remember" organizational committee

2020-   UCI End Racism Initiative, Outreach to Black students working group

2020   Campuswide honors program coffee hour

2019-   First generation First quarter program, Faculty ally

2019-   UCI Prison Bachelor's program, advisory board, curriculum committee

2019   Cognitive Sciences faculty search committee

2019   KUCI Public Affairs interview

2018,20   Cognitive Sciences PhD admissions committee

Organizational service

2021   Center for Neurobiology of Learning and Memory Spring Meeting Co-organizer (with Lulu Chen)

2018   Princeton Neuroscience Institute "Inside-Out" seminar series Co-organizer (with Ahmed El Hady)

2018 "Goal-Directed Decision Making: Computations and Circuits" *Elsevier* Co-editor (with Richard Morris & Amitai Shenhav)

2015   COSYNE Workshop "Memory in action: The role(s) of the hippocampus in decisions for reward" Co-organizer (with G. Elliott Wimmer)