Aaron M. Bornstein   Updated: August 25, 2019

CONTACT   aaron.bornstein@uci.edu   http://aaron.bornstein.org/

CITIZENSHIP   USA

POSITIONS

2019-   Assistant Professor, Department of Cognitive Science
            Fellow, Center for the Neurobiology of Learning and Memory
            University of California, Irvine
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
        Thesis: "Functions of the hippocampal memory system in instrumental control."
2003   S.B., Mathematics (additional concentration in Economics)
        Massachusetts Institute of Technology

WORKING
PAPERS

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

Bornstein AM*, Pickard H*. Chasing the first high: Memory sampling in drug choice.

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

Kane GA, **Bornstein AM**, Shenhav A, Wilson RC, Aston-Jones G, Daw ND, Cohen JD. Rats exhibit similar biases in foraging and intertemporal choice tasks. *bioRxiv.* doi:10.1101/497321

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

Rouhani N, Norman KA, Niv Y, **Bornstein AM**. Joy division: Reward prediction errors create event boundaries in memory. *bioRxiv.* doi:10.1101/725440

PEER-REVIEWED JOURNAL ARTICLES

Hoskin AN, **Bornstein AM**, Norman KA, Cohen JD (2019). 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

Millner AJ, den Ouden HEM, Gershman SJ, Glenn CR, Kearns J, **Bornstein AM**, Marx BP, Keane TM, Knock 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

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

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

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

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

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

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.

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

REVIEWS, COMMENTARIES, BOOK CHAPTERS

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

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

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

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

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

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

ABSTRACTS IN CONFERENCE PROCEEDINGS (SELECTED)

Rmus M, Ritz H, Hunter LE, **Bornstein AM**, Shenhav A. Model-based decision making is associated with structure inference ability. Society for Neuroeconomics Annual Meeting, Philadelphia, PA. October 2018.

Hunter LE*, **Bornstein AM***, Hartley CA. Two paths to patience: Individual differences in deliberate, but not automatic, intertemporal choice predict model-based planning in humans. Society for Neuroeconomics Annual Meeting, Philadelphia, PA. October 2018.

Hoskin AN, **Bornstein AM**, Norman KA, Cohen JD. Refresh my memory: Context information from episodic memory affects working memory maintenance. Society for Neuroscience Annual Meeting. Washington, DC. November 2017.

Bornstein AM, Aly M, Feng SF, Turk-Browne NB, Norman KA, Cohen JD. Memory-guided perception: Sampling from past experience during perceptual inference. Society for Neuroscience Annual Meeting. San Diego, CA. November 2016.

Morris RW*, Shenhav A*, **Bornstein AM**, Collins AGE, Gershman SJ, Gillan CM, Liljeholm M. Minisymposium: Understanding goal-directed decision-making in humans: computations and circuits. Society for Neuroscience Annual Meeting. Chicago, IL. October 2015.

Bornstein AM, Norman KA. Context of recalled choice events affects subsequent decisions for reward. Society for Neuroeconomics Annual Meeting. Miami, FL. September 2014. [Spotlight poster]

Bornstein AM, Khaw MW, Daw ND. Episodic cues affect decisions for reward in humans. Society for Neuroeconomics Annual Meeting. Lausanne, Switzerland. September 2013.

Khaw MW, **Bornstein AM**, Daw ND. Evidence for decision by sampling in reinforcement learning. COSYNE. Salt Lake City, Utah. March 2013.

Bornstein AM, Geib TA, Daw ND. A hippocampal-cortical network underlies model-based planning in humans. COSYNE. Salt Lake City, Utah. February 2012.

Bornstein AM, Daw ND. Computational mechanisms of transition learning in unrewarded sequences. Society for Neuroscience Annual Meeting. Chicago, IL, October 2009.

INVITED TALKS (SELECTED)	Jan 2020	Winter Conference on the Neurobiology of Learning and Memory, Park City
	Oct 2019	University of California, Los Angeles
	Sep 2019	Facebook Research Labs, Seattle
	May 2019	University of California, Los Angeles
	Apr 2019	Brown University
	Jan 2019	National Institute of Drug Abuse Extramural, Behavioral and Cognitive Neuroscience
	Jan 2019	National Institute of Drug Abuse Intramural, Behavioral Neuroscience Research Branch
	Mar 2018	Cosyne workshop "Hippocampal computations and interactions supporting statistical learning and decision-making"
	Dec 2017	Cognition and Brain Sciences Unit, Cambridge University
	Oct 2017	Johns Hopkins University
	Feb 2015	Mount Sinai School of Medicine
	Jun 2014	Sackler Institute, 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

FUNDING AWARDS	2019	UC Irvine School of Social Sciences Research & Travel award
	2011-2013	NIH/NIMH Predoctoral fellowship (NRSA)
	2007-2012	NYU Opportunity fellowship

AWARDS & HONORS (SELECTED)	2011-2013	NIH/NIMH Predoctoral fellowship (NRSA)
	2007-2012	NYU Opportunity fellowship
	2005,6,8	Honorable mention, NSF Graduate Research Fellowship

Teaching	**University of California, Irvine**	Irvine, CA USA

Spring 2020   Topics in Reinforcement Learning (Graduate; co-instructor w Prof. Mimi Liljeholm)

Spring 2019 Research in Exp Psych (co-instructor w Prof. Nadia Chernyak)

Winter 2019   Advanced Experimental Psychology

New York University   New York, NY USA

Fall 2011   Machine Learning (Graduate), TA (Prof. Yann Lecun)

Fall 2009   Cognitive Neuroscience, TA (Prof. Nathaniel D. Daw)

Fall 2008   Lab in Perception, TA (Dr. Shani Offen, Prof. David J. Heeger)

Spring 2008   Cognition, TA (Prof. Robert E. Rehder)

Massachusetts Institute of Technology   Cambridge, MA

Fall 1999 Introduction to Computers and Engineering Problem Solving, LA

Spr 1999   Computer System Architecture (Graduate), TA (Prof. Arvind)

Other teaching

July 2018   Cold Spring Harbor Computational & Cognitive Neuroscience Summer School, Suzhou, China (Faculty, reinforcement learning module)

Fall 2016 – Fall 2018   Princeton Prison Teaching Initiative (Instructor, co-organizer; Highschool & College Algebra, Statistics, Composition)f

Summer 2007, 2008 MIT Middle East Education through Technology (MEET), Jerusalem. (Lead instructor)

Professional activities

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

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

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

2010-Present Ad-hoc reviewer: Acta Psychologica; Attention, Perception, & Psychophysics; Biological Cybernetics; BMC Neuroscience; Cerebral Cortex; Cognition; Cognitive, Affective, and Behavioral Neuroscience; Cognitive Science; Cortex; COSYNE; European Journal of Neuroscience; European Neuropsychopharmacology; Frontiers in Behavioral Neuroscience; Human Brain Mapping; ICDL; Journal of Cognitive Neuroscience; Journal of Neuroscience; Nature Communications; Nature Human Behavior; Neuroimage: Clinical; PLoS Computational Biology; PLoS ONE; PNAS; Topics in Cognitive Science; Visual Cognition

OTHER
ACTIVITIES

2011-2012	New York University Graduate Forum (Moderator)
Spr 2012	Advanced science writing workshop, Prof. Stephen Hall
2009-2011	New York University Graduate Forum (Member)
Fall 2010	Science writing workshop, Prof. Stephen Hall
Jul 2010	CEU Summer School on "Probabilistic models of cognitive systems." Budapest, Hungary
Aug 2009	Advanced Course in Computational Neuroscience. Freiburg, Germany