

Yael Niv

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Affiliations

- from 2018 **Professor** of Psychology and the Princeton Neuroscience Institute, Princeton University
2015-2018 **Associate Professor**, Princeton University
2008-2015 **Assistant Professor**, Princeton University
2007-2008 **Post-doctoral Fellow**, Princeton University

Education

- 2002-2007 **The Hebrew University of Jerusalem, Interdisciplinary Center for Neural Computation & UCL, Gatsby Computational Neuroscience Unit – PhD *summa cum laude*, Jan 2008**
Thesis research: "*The effects of motivation on habitual instrumental behavior*"
Supervisors: Peter Dayan (Gatsby Computational Neuroscience Unit), Daphna Joel (Tel-Aviv University) and Hanoch Gutfreund (Interdisciplinary Center for Neural Computation)
1999-2001 **Tel-Aviv University, Psychology Department – MA *summa cum laude*, Dec 2001**
Thesis research: "Evolution of Reinforcement Learning in Uncertain Environments"
Supervisors: Eytan Ruppin (Computer Science), and Daphna Joel (Psychology)
1995-1999 **Tel-Aviv University, the Adi Lautman Interdisciplinary Program for Fostering Excellence (cross-disciplinary BA-bypass program) – Undergraduate studies according to an individually designed interdisciplinary curriculum focused on computational neuroscience.**

External Funding (as PI unless otherwise stated)

- 2016-2021 National Institute on Drug Abuse R01 – Orbitofrontal cortex as a cognitive map of task states
2014-2019 Army Research Office Presidential Early Career Award for Science and Engineering (PECASE) – The computational and neural basis of reinforcement learning in multidimensional environments
2012-2018 John Templeton Foundation – Toward a scientific understanding of the human capacity for cognitive control (co-I with Jonathan Cohen (PI), Nathaniel Daw, Kenneth Norman, Nickolas Turk-Browne)
2012-2015 National Institute for Mental Health R01 – Neural and computational mechanisms of selective attention in experience based decision-making
2012-2015 Human Frontiers Science Program Organization (HFSP) – The striatal cholinergic system and attention for learning: from neurotransmission to personality (co-PI with Jeff Wickens, Genela Morris, Anastasia Christakou)
2012-2015 NSF Collaborative Research in Computational Neuroscience (CRCNS) – Neural correlates of hierarchical reinforcement learning (co-PI with Matt Botvinick and Andy Barto)
2011-2015 Ellison Medical Foundation Scholar – Interactions between learning and attention throughout the lifespan

- 2011-2012 National Institute for Drug Abuse R03 – fMRI investigations of how we learn what is relevant for a decision
- 2010-2014 Sloan Research Fellowship – Using advanced computational methods to understand learning
- 2010-2012 United States–Israel Binational Science Foundation – Neural correlates of multidimensional learning: dimensionality reduction in striatal representations (co-PI with Genela Morris)

Fellowships & Awards

- 2015 National Academy of Sciences Troland Research Award
- 2014 Recipient of 2012 Presidential Early Career Award for Scientists and Engineers (PECASE)
- 2011-2015 Ellison Medical Foundation Scholar
- 2010-2012 Alfred P. Sloan Research Fellow
- 2007-2008 Human Frontiers Science Program, Long term post-doctoral fellowship “*How we learn what is relevant: fMRI of prefrontal-basal ganglia interactions in uninstructed tasks*”
- 2008 The Hebrew University of Jerusalem – Max Schlomiuk award for outstanding PhD thesis
- 2007 Rothschild post-doctoral fellowship (declined)
- 2004-2006 Rector’s Excellence PhD fellowship, Hebrew University
- 2005 NIPS Outstanding Student Paper award
- 2001-2004 Merit based scholarship, Interdisciplinary Center for Neural Computation
- 2004 Computational Neuroscience (CNS) best talk award
- 2004 Dan David Scholarship for PhD Graduate Students in the field of Brain Sciences
- 2003 EC Thematic Network Fellowship for academic visit to the Gatsby Computational Neuroscience Unit
- 1996-1997 Adi Lautman Interdisciplinary Program for Fostering Excellence, outstanding achievements award
- 1995-1999 Merit based scholarship, Adi Lautman Interdisciplinary Program for Fostering Excellence

Peer reviewed publications (* denotes equally contributing authors)

- In Process **N Schuck & Y Niv** – *Sequential replay of non-spatial task states in the human hippocampus* – under revision at *Science*
- E Eldar, V Felso, JD Cohen & Y Niv** – *A pupillary index of susceptibility to decision biases* – accepted as Stage I registered report in *Nature Human Behavior*, posted on [bioRxiv](#)
- A Radulescu & Y Niv** – *State representation in mental illness* – under revision at *Current Opinion in Neurobiology* (special issue on *Machine Learning, Big Data, and Neuroscience*)
- A Radulescu, Y Niv & IC Ballard** – *Holistic reinforcement learning: The role of structure and attention* – under revision in *Trends in Cognitive Science*
- YS Shin & Y Niv** – *Biased evaluations emerge from inferring hidden causes* – under revision at *Nature Human Behavior*
- In Press **D Bennett, SM Silverstein & Y Niv** – *The two cultures of computational psychiatry* – in press at

JAMA Psychiatry

- 2019 **MJ Sharpe, T Stalnaker, NW Schuck, S Killcross, G Schoenbaum & Y Niv (2019)** – *An integrated model of action selection: distinct modes of cortical control of striatal decision making* – Annual Review of Psychology 70:53-76
- 2018 **N Rouhani, KA Norman & Y Niv (2018)** – *Dissociable effects of surprising rewards on learning and memory* – Journal of Experimental Psychology: Learning, Memory & Cognition 44(9), 1430-1443
- GB Hermsdorff, T Pereira & Y Niv (2018)** – *Quantifying Humans' Priors Over Graphical Representations of Tasks*. In: A Morales et al. (eds), *Unifying Themes in Complex Systems IX*. ICCS 2018, 281-290. Springer Proceedings in Complexity
- Y Sagiv, S Musslick, Y Niv & JD Cohen (2018)** – *Efficiency of learning vs. processing: Towards a normative theory of multitasking* – Proceedings of the 40th Annual Meeting of the Cognitive Science Society, 1004-1009
- AJ Langdon, MJ Sharpe, G Schoenbaum & Y Niv (2018)** – *Model-based predictions for dopamine* – Current Opinion in Neurobiology 49:1-7
- 2017 **S Dubrow, N Rouhani, Y Niv & KA Norman (2017)** – *Does mental context drift or shift?* – Current Opinion in Behavioral Sciences 17:141-146
- MJ Sharpe, NJ Marchant, LR Whitaker, CT Richie, YJ Zhang, EJ Campbell, PP Koivula, JC Necarsulmer, C Mejias-Aponte, M Morales, J Pickel, JC Smith, Y Niv, Y Shaham, BK Harvey* & G Schoenbaum* (2017)** – *Lateral hypothalamic GABAergic neurons encode reward predictions that are relayed to the ventral tegmental area to regulate learning*. Current Biology 27:2089-2100
- SJ Gershman, M-H Monfils, KA Norman & Y Niv (2017)** – *The computational nature of memory modification* – eLife 6:e23763
- MJ Sharpe, CY Chang, MA Liu, HM Bachelor, LE Mueller, JL Jones, Y Niv & G Schoenbaum (2017)** – *Dopamine transients are sufficient and necessary for acquisition of model-based associations* – Nature Neuroscience 20:735-742
- YC Leong*, A Radulescu*, R Daniel, V DeWoskin & Y Niv (2017)** – *Dynamic interaction between reinforcement learning and attention in multidimensional environments* – Neuron 93:451-463
- A Auchter, L Cormack, Y Niv, F Gonzalez-Lima & M-H Monfils (2017)** – *Reconsolidation-extinction interactions in fear-memory attenuation: the role of inter-trial interval variability* – Frontiers in Behavioral Neuroscience 11:2. doi: 10.3389/fnbeh.2017.00002
- JD Cohen, N Daw, B Engelhardt, U Hasson, K Li, Y Niv, KA Norman, J Pillow, PJ Ramadge, NB Turk-Browne & TL Wilke (2017)** – *Computational approaches to fMRI analysis* – Nature Neuroscience 20(3):304-313
- 2016 **N Schuck, MB Cai, RC Wilson & Y Niv (2016)** – *Human orbitofrontal cortex represents a cognitive map of state space* – Neuron 91(6):1402-12
- MB Cai, NW Schuck, J Pillow & Y Niv (2016)** – *A Bayesian method for reducing bias in neural representational similarity analysis* – Advances in Neural Information Processing Systems 29 (NIPS 2016), 4952-4960
- E Eldar, JD Cohen & Y Niv** – *Amplified selectivity in cognitive processing implements the neural gain model of norepinephrine function* – Behavioral and Brain Sciences, 39:e206 (commentary)

on: M Mather, D Clewett, M Sakaki & CW Harley – *Norepinephrine ignites local hot spots of neuronal excitation: How arousal amplifies selectivity in perception and memory*)

E Eldar, Y Niv & JD Cohen (2016) – *Do you see the forest or the trees? Neural gain and integration during perceptual processing* – *Psychological Science*, 27(12):1632-1643

A Radulescu, R Daniel & Y Niv (2016) – *The effects of aging on the interaction between reinforcement learning and attention* – *Psychology and Aging* 31(7):747-757

SCY Chan, Y Niv* & KA Norman* (2016) – *A probability distribution over latent causes in the orbitofrontal cortex* – *J Neuroscience* 36(30):7817-7828

D Arkadir, A Radulescu, D Raymond, N Lubarr, SB Bressman, P Mazzoni & Y Niv (2016) – *A genetic movement disorder increases risk taking in humans* – *eLife* 5:e14155

Y Takahashi*, A Langdon*, Y Niv & G Schoenbaum (2016) – *Temporal specificity of reward prediction errors signaled by putative dopamine neurons in rat VTA depends on ventral striatum* – *Neuron* 91(1):182-193

Y Niv & A Langdon (2016) – *Reinforcement learning with Marr* – *Current Opinion in Behavioral Sciences* 11:67-73

E Eldar*, RB Rutledge*, RJ Dolan & Y Niv (2016) – *Mood as representation of momentum* – *Trends in Cognitive Science* 20(1):15-24

2015 **SJ Gershman, KA Norman & Y Niv (2015)** – *Discovering latent causes in reinforcement learning* – *Current Opinion in Behavioral Sciences* 5:43-50

Dunsmoor JE, Niv Y, Daw ND & Phelps EA (2015)– *Rethinking extinction*–*Neuron*,88:47-63

Y Niv, R Daniel, A Geana, SJ Gershman, YC Leong, A Radulescu & RC Wilson (2015) – *Reinforcement learning in multidimensional environments relies on attention mechanisms* – *J Neuroscience* 35(21): 8145-8157

A Geana & Y Niv (2015) – *Causal model comparison shows that human representation learning is not Bayesian* –Cold Spring Harbor Symposia on Quantitative Biology, Volume 79: Cognition

RC Wilson & Y Niv (2015) – *Is model fitting necessary for model-based fMRI?* – *PLoS Computational Biology* 11(6): e1004237

SJ Gershman & Y Niv (2015) – *Novelty and inductive generalization in human reinforcement learning* –*Topics in Cognitive Science* 7(3),391-415

E Eldar & Y Niv (2015) – *Interaction between emotional state and learning underlies mood instability* – *Nature Communications* 6:6149

2014 **SJ Gershman, A Radulescu, KA Norman & Y Niv (2014)** – *Statistical computations underlying the dynamics of memory updating* – *PLoS Computational Biology* 10(11) e1003939

FA Soto, SJ Gershman & Y Niv (2014) – *Explaining compound generalization in associative and causal learning through rational principles of dimensional generalization* – *Psychological Review* 121(3):526-558

RC Wilson, YK Takahashi, G Schoenbaum* & Y Niv* (2014) – *Orbitofrontal cortex encodes a cognitive map of task space* – *Neuron* 81(2): 267-279

A Solway*, C Diuk*, N Cordova, D Yee, AG Barto, Y Niv & MM Botvinick (2014) – *Optimal behavioral hierarchy* – *PLoS Computational Biology* 10(8): e1003779

2013 **SJ Gershman, CJ Jones, KA Norman, M-H Monfils & Y Niv (2013)** – *Gradual extinction*

- prevents the return of fear: implications for the discovery of state* – *Frontiers in Behavioral Neuroscience* 7:164
- SJ Gershman & Y Niv (2013)** – *Perceptual estimation obeys Occam's razor* – *Frontiers in Psychology* 4:623
- E Eldar, JD Cohen & Y Niv (2013)** – *The effects of neural gain on attention and learning* – *Nature Neuroscience* 16:1146-1153
- A Christakou, SJ Gershman, Y Niv, A Simmons, M Brammer & K Rubia (2013)** – *Neural and psychological maturation of decision-making in adolescence and young adulthood* – *The Journal of Cognitive Neuroscience* 25(11): 1807-1823
- C Diuk, K Tsai, JD Wallis, MM Botvinick & Y Niv (2013)**– *Two simultaneous, but separable, prediction errors in human ventral striatum* – *The Journal of Neuroscience* 33(13):5797-5805
- 2012 **SJ Gershman & Y Niv (2012)** – *Exploring a latent cause theory of classical conditioning* – *Learning & Behavior* 40:255-268
- F Lucantonio, TA Stalnaker, Y Shaham, Y Niv & G Schoenbaum (2012)** – *The impact of orbitofrontal dysfunction on cocaine addiction* – *Nature Neuroscience* 15(3):358-366
- RC Wilson & Y Niv (2012)** – *Inferring relevance in a changing world* – *Frontiers in Human Neuroscience* 5:189. doi:10.3389/fnhum.2011.00189
- Y Niv, J Edlund, P Dayan & JP O'Doherty (2012)** – *Neural prediction errors reveal a risk-sensitive reinforcement learning process in the human brain* – *The Journal of Neuroscience* 32(2):551-562
- 2011 **YK Takahashi, MR Roesch, RC Wilson, K Toreson, P O'Donnell, Y Niv* & G Schoenbaum* (2011)** – *Expectancy-related changes in firing of dopamine neurons depend on orbitofrontal cortex* – *Nature Neuroscience* 14(12):1590-1597
- E Eldar, G Morris & Y Niv (2011)** – *The effects of motivation on response rate: A hidden semi-Markov model analysis of behavioral dynamics* – *The Journal of Neuroscience Methods* 201:251-261
- JJF Ribas-Fernandes, A Solway, C Diuk, JT McGuire, AG Barto, Y Niv & MM Botvinick (2011)** – *A neural signature of hierarchical reinforcement learning* – *Neuron* 71:370-379
- M McDannald, F Lucantonio, K Burke, Y Niv & G Schoenbaum (2011)** – *Ventral striatum and orbitofrontal cortex are both required for model-based, but not model-free, reinforcement learning* – *The Journal of Neuroscience* 31(7):2700-2705
- 2010 **SJ Gershman, JD Cohen & Y Niv (2010)** – *Learning to selectively attend* – *Proceedings of the 32nd Annual Conference of the Cognitive Science Society*
- SJ Gershman & Y Niv (2010)** – *Learning latent structure: Carving nature at its joints* – *Current Opinion in Neurobiology* 20(2):251–256 (Special issue on Cognitive Neuroscience)
- SJ Gershman, DM Blei & Y Niv (2010)** – *Context, learning and extinction* – *Psychological Review*, 117(1):197-209
- 2009 **MT Todd, Y Niv & JD Cohen (2009)** – *Learning to use working memory in partially observable environments through dopaminergic reinforcement* – In: D Koller, D Schuurmans, Y Bengio & L Bottou, eds., *Advances in Neural Information Processing Systems* 21, 1689–1696
- Y Niv (2009)** – *Reinforcement learning in the brain* – *Journal of Mathematical Psychology* 53(3), 139-154 (special issue on partially observable Markov decision processes)

- MM Botvinick, Y Niv & AC Barto (2009) – *Hierarchically organized behavior and its neural foundations: A reinforcement-learning perspective* – *Cognition* 113, 262–280
- 2008 P Dayan & Y Niv (2008) – *Reinforcement learning: The Good, The Bad, and The Ugly* – *Current Opinion in Neurobiology*, 18(2), 185-196 (special issue on Cognitive Neuroscience)
- Y Takahashi, G Schoenbaum & Y Niv (2008) – *Silencing the Critics: Understanding the effects of cocaine sensitization on dorsal and ventral striatum in the context of an Actor/Critic model* – *Frontiers in Neuroscience* 2, 86-99
- D Schiller, I Levy, Y Niv, JE LeDoux & EA Phelps (2008) – *From fear to safety and back – Reversal of fear in the human brain* – *The Journal of Neuroscience* 28(45), 11517-11525
- Y Niv & G Schoenbaum (2008) – *Dialogues on prediction errors* – *Trends in Cognitive Science* 12(7):265-272
- 2007 Y Niv, ND Daw, D Joel & P Dayan (2007) – *Tonic dopamine: Opportunity costs and the control of response vigor* – *Psychopharmacology* 191(3), 507-520 (special issue on dopamine)
- Y Niv (2007) – *Cost, Benefit, Tonic Phasic: What do response rates tell us about dopamine and motivation?* – *Annals of the New York Academy of Science* 1104, 357-376
- 2006 Y Niv, D Joel & P Dayan (2006) – *A normative perspective on motivation* – *Trends in Cognitive Sciences* 10(8), 375-381
- P Dayan, Y Niv, B Seymour & ND Daw (2006) – *The misbehavior of value and the discipline of the will* – *Neural Networks* 19(8), 1153-1160 (special issue on decision making)
- 2005 Y Niv, ND Daw & P Dayan (2005) – *How fast to work: Response vigor, motivation and tonic dopamine* – In: Y. Weiss, B. Schölkopf and J. Platt, eds., *Neural Information Processing Systems* 18, 1019-1026, MIT Press (Conference Talk, Outstanding Student Paper Award)
- ND Daw, Y Niv & P Dayan (2005) – *Uncertainty based competition between prefrontal and dorsolateral striatal systems for behavioral control* – *Nature Neuroscience*, 8(12),1704-1711
- Y Niv, MO Duff & P Dayan (2005) – *Dopamine, uncertainty and TD learning* – *Behavioral and Brain Functions* 1:6
- 2002 Y Niv, D Joel, I Meilijson & E Ruppín (2002) – *Evolution of reinforcement learning in uncertain environments: A simple explanation for complex foraging behaviors* – *Adaptive Behavior* 10(1), 5-24
- D Joel, Y Niv & E Ruppín (2002) – *Actor-critic models of the basal ganglia: New anatomical and computational perspectives* – *Neural Networks* 15, 535-547
- 2001 Y Niv, D Joel, I Meilijson & E Ruppín (2001) – *Evolution of reinforcement learning in foraging bees: A simple explanation for risk averse behavior* – *Neurocomputing* 44(1), 951-956

Commentaries, chapters, technical reports

- In press D Bennett & Y Niv – *Opening Burton's Clock: Psychiatric insights from computational cognitive models*. In: Gazzaniga, Mangun & Poeppel (eds.) *The Cognitive Neurosciences*, 6/e (currently posted on [PsyArXiv](#))
- NW Schuck, RC Wilson & Y Niv – *A state representation for reinforcement learning and decision making in the orbitofrontal cortex* – In: Bornstein, A., Shenhav, A. And Morris, R. (Eds.), *Understanding Goal-Directed Decision Making: Computations and Circuits*. Amsterdam, NL: Elsevier. (also posted on [bioRxiv](#))
- Y Niv – *On the primacy of behavioral research for understanding the brain* – In: *Current*

controversies in cognitive science

- 2018 **Y Niv (2018)** – *Deep down, you are a scientist*. In: D Linden, ed. Think Tank: Forty Neuroscientists Explore the Biological Roots of Human Experience. Yale Press.
- 2016 **Z Kurth-Nelson, JP O’Doherty, DM Barch, S Denève, D Durstewitz, MJ Frank, JA Gordon, SJ Mathew, Y Niv, K Ressler & H Tost (2016)** – *Computational Approaches for Studying Mechanisms of Psychiatric Disorders*. In: AD Redish & JA Gordon, eds. Computational Psychiatry: New Perspectives on Mental Illness. [Strüngmann Forum Reports](#), vol. 20, J. Lupp, series editor. Cambridge, MA: [MIT Press](#)
- 2015 **MJ Sharpe, AM Wikenheiser, Y Niv & G Schoenbaum (2015)** – *The state of the orbitofrontal cortex* – Neuron 88(6):1075-1077
- R Daniel, NW Schuck & Y Niv (2015)** – *How to divide and conquer the world, one step at a time* – PNAS 112(10), 2929-2930
- Y Niv, A Radulescu & A Langdon (2015)** – *A free-choice premium in the basal ganglia* – Trends in Cognitive Science, 19(1), 4-5
- 2013 **Y Niv (2013)** – *Dopamine ramps up* – Nature 500(7464), 533-5
- G Schoenbaum, TA Stalnaker, Y Niv (2013)** – *How did the chicken cross the road? With her striatal cholinergic interneurons, of course* – Neuron, 79(1), 3-6
- 2012 **C Diuk, A Schapiro, N Cordova, Y Niv & MM Botvinick (in press)** – *Divide and conquer: Hierarchical reinforcement learning and task decomposition in humans*. In: G Baldassare & M Mirolli eds., Computational and Robotic Models of the Hierarchical Organization of Behavior, Springer Verlag
- MM Botvinick, Y Niv & A Barto (2012)** – *Hierarchically organized behavior and its neural foundations: A reinforcement learning perspective*. In: A Seth, T Prescott & J Bryson, eds., Modelling Natural Action Selection, pp. 264-269, Cambridge: Cambridge University Press
- 2011 **Y Niv & S Chan (2011)** – *On the value of information and other rewards* – Nature Neuroscience 14(9), 1095-1097
- JJF Ribas-Fernandes, Y Niv & MM Botvinick (2011)** – *Neural correlates of hierarchical reinforcement learning* In: RB Mars, J Sallet MFS Rushworth & N Yeung, eds., Neural basis of motivational and cognitive control, Chapter 17, pp. 285-310, MIT Press
- 2008 **Y Niv & PR Montague (2008)** – *Theoretical and Empirical Studies of Learning* – In: P.W. Glimcher, C.F. Camerer, E. Fehr & R.A. Poldrack, eds., Neuroeconomics: Decision making and the brain, Chapter 22, pp. 329-349, Elsevier
- P Dayan, ND Daw & Y Niv (2008)** – *Learning, action, inference and neuromodulation* – In: L. Squire et al, eds., Encyclopedia of Neuroscience, Elsevier, Amsterdam
- 2007 **Y Niv & M Rivlin-Etzion (2007)** – *Parkinson’s disease: Fighting the will?* – Journal of Neuroscience, 24(44), 11777-11779
- 2006 **Y Niv, ND Daw & P Dayan (2006)** - *Choice values* - Nature Neuroscience 9(8), 987-988
- ND Daw, Y Niv & P Dayan (2006)** - *Actions, policies, values, and the basal ganglia* – In: Bezdard, E. editor, Recent Breakthroughs in Basal Ganglia Research, Nova Science Publishers Inc., New York, USA
- Y Niv, P Dayan & D Joel (2006)** - *The effects of motivation on extensively trained behavior* - Leibniz Technical Report, Hebrew University, 2006-6

Selected Abstracts

- 2019 **D Bennett, A Radulescu, S Zorowitz & Y Niv (2019)** – *Assessing mood's effect on attention in value-based decision making* – Society for Affective Science
- 2018 **A Radulescu & Y Niv (2018)** – *Separable attention processes constrain multidimensional reinforcement learning* – Society for Neuroscience Abstracts 334.16
- SD McDougle, DE Parvin, PA Butcher, F Mushtaq, Y Niv, R Ivry & JA Taylor (2018)** – *Striatal prediction errors in a decision-making task are modulated by action execution failures* – Society for Neuroscience Abstracts 429.08
- M Sharpe, H Batchelor, L Mueller, Y Niv & G Schoenbaum (2018)** – *Dopamine transients contribute to model-based learning without endowing antecedent cues with value* – Society for Neuroscience Abstracts 109.10
- J Zhou, M Gardner, T Stalnaker, S Rasmus, A Wikenheiser, M Montesinos-Cartagena, Y Niv & G Schoenbaum (2018)** – *Representation of environmental structure by the orbitofrontal cortex and hippocampus within an odor sequence task* – Society for Neuroscience Abstracts 360.07
- N Rouhani & Y Niv (2018)** – *Dynamics of memory for events triggering reward anticipation versus reward outcome* – Context and Episodic Memory Symposium (CEMS).
- D Bennett, C Lee & Y Niv (2018)** – *Mood-congruency in the relationship between affect and valuation* – Decision Science pre-conference of the Society for Affective Science
- D Bennett & Y Niv (2018)** – *A computational process model of affect dynamics* – Society for Affective Science
- G Davidson, A Radulescu & Y Niv (2018)** – *Passive forgetting or selective attention? Comparing two models of learning in multidimensional environments* – Computational Cognitive Neuroscience
- D Bennett & Y Niv (2018)** – *The interaction between mood and value* – Society of Biological Psychiatry Annual Meeting 83(9)
- GB Hermsdorff, T Pereira & Y Niv (2018)** – *Quantifying people's priors over graphical representations of tasks* – The 9th International Conference on Complex Systems, ICCS2018 (Oral presentation)
- D Bennett & Y Niv (2018)** – *The interaction between mood and value* – Biol Psychiatry 83(9)
- 2017 **A Radulescu, YC Leong & Y Niv (2017)** – *Predicting trial-by-trial attention dynamics during human reinforcement learning* – Journal of Vision 17 (10), 1098
- J Bu, A Radulescu, N Turk-Browne & Y Niv (2017)** – *Feature-based reward learning biases dimensional attention* – Journal of Vision 17(10), 1297
- MB Cai, N Schuck, M Anderson, J Pillow & Y Niv (2017)** – *Should you trust your RSA result? A Bayesian method for reducing bias in neural representational similarity analysis* – Journal of Vision 17(10), 571
- D Bennett & Y Niv (2017)** – *A computational process model of affect dynamics* – Society for Affective Science
- A Langdon, Y Takahashi, MR Roesch, G Schoenbaum & Y Niv (2017)** – *Dynamic neural representation of reward predictions* – Society for Neuroscience (nano-symposium talk)

NW Schuck & Y Niv (2017) – *Sequential replay of non-spatial task states in the human hippocampus* – Society for Neuroscience (nano-symposium talk)

MJ Sharpe, NJ Marchant, LR Whitaker, CT Richie, YJ Zhang, EJ Campbell, PP Koivula, JC Necarsulmer, C Mejias-Aponte, M Morales, J Pickel, JC Smith, Y Niv, Y Shaham, BK Harvey* & G Schoenbaum* (2017) – *An unlikely circuit for cue-reward learning* – Society for Neuroscience

YS Shin & Y Niv (2017) – *Latent cause inference in social biases* – Computational Cognitive Neuroscience

MB Cai, NW Schuck, JW Pillow & Y Niv (2017) – *Spurious structure in representational similarity analysis and a Bayesian approach to reducing bias in RSA of fMRI data* – Computational Cognitive Neuroscience

MB Cai, NW Schuck, JW Pillow & Y Niv (2017) – *When temporal similarity is mistaken for representational similarity: a Bayesian approach to reduce bias in RSA of fMRI data* – Society for Neuroscience

A Radulescu, YC Leong & Y Niv (2017) – *Reward-sensitive attention dynamics during human reinforcement learning* – Reinforcement Learning and Decision Making (RLDM2017), selected as an oral presentation

MJ Sharpe, CY Chang, MA Liu, HM Bathelor, LE Mueller, JL Jones, Y Niv & G Schoenbaum (2017) – *Dopamine transients are sufficient and necessary for acquisition of model-based associations* – Reinforcement Learning and Decision Making (RLDM2017), selected for a spotlight presentation

YS Shin & Y Niv (2017) – *Latent cause inference in social biases* – Reinforcement Learning and Decision Making (RLDM2017)

A Jaskir & Y Niv (2017) – *Modeled learning weights predict attention and memory in a multidimensional probabilistic task* – Reinforcement Learning and Decision Making (RLDM2017)

LX Cai, Y Niv & IB Witten (2017) – *A positive feedback loop between dopamine and freezing opposes extinction of fear conditioning* – Reinforcement Learning and Decision Making (RLDM2017)

GB Hermsdorff & Y Niv (2017) – *Characterizing people's priors over naturalistic task structure* – Reinforcement Learning and Decision Making (RLDM2017)

PF Hitchcock, A Radulescu, Y Niv & CR Sims (2017) – *Assessing the potential of computational modeling in clinical science* – Reinforcement Learning and Decision Making (RLDM2017)

AJ Langdon & Y Niv (2017) – *Time-adaptive temporal difference reinforcement learning* – Reinforcement Learning and Decision Making (RLDM2017)

MB Cai, NW Schuck, MJ Anderson, JW Pillow & Y Niv (2017) – *Bias in neural representational similarity analysis and a Bayesian method for reducing bias* – Reinforcement Learning and Decision Making (RLDM2017)

N Rouhani, KA Norman & Y Niv (2017) – *Dissociable effects of surprising rewards on learning and memory* – Reinforcement Learning and Decision Making (RLDM2017)

P Hitchcock, A Radulescu, Y Niv & CR Sims (2017) – *Translating a reinforcement learning*

task in a computational psychiatry assay: Challenges and Strategies – CogSci

A Langdon, Y Takahashi, M Roesch, G Schoenbaum & Y Niv (2017) – *Dynamic neural representation of reward predictions in rat ventral striatum during learning* – COSYNE

NW Schuck & Y Niv (2017) – *Task states are represented in OFC during task performance and replayed in hippocampus at rest* – COSYNE

2016 **N Rouhani & Y Niv (2016)** – *Reward prediction errors affect episodic memory: implications for depression* – Annual meeting of the American College of Neuropsychopharmacology (ACNP)

GB Hermsdorff & Y Niv (2016) – *Hemodynamic response function for prediction errors in the ventral striatum* – Society for Neuroscience

MJ Sharpe, CY Chang, MA Liu, Y Niv, JL Jones & Geoffrey Schoenbaum (2016) – *Dopaminergic error signals support associative structures used for model-based behaviors* – Society for Neuroscience

N Rouhani, KA Norman & Y Niv (2016) – *Reward prediction errors enhance episodic memory* – Society for Neuroscience

A Radulescu, C Allefeld, N Schuck, J-D Haynes & Y Niv (2016) – *Studying value guided decision making through model-based multivariate fMRI* – Society for Neuroeconomics

N Rouhani, KA Norman & Y Niv (2016) – *Reward prediction errors enhance episodic memory* – Society for Neuroeconomics

YS Shin & Y Niv (2016) – *Finding it hard to change your mind after one bad experience? You might be too Bayesian* – Society for Neuroeconomics

N Rouhani, KA Norman & Y Niv (2016) – *Reward prediction errors enhance episodic memory* – Context and Episodic Memory Symposium

A Langdon, Y Takahashi, G Schoenbaum & Y Niv (2016) – *Temporal expectations in reward prediction: ‘what’ and ‘when’ computations in the basal ganglia* – COSYNE 2016 (selected as an oral presentation)

2015 **A Langdon, Y Takahashi, G Schoenbaum & Y Niv (2015)** – *Ventral striatum is necessary for temporal specificity of expectations in dopaminergic reward prediction error signals* – Society for Neuroscience

M Granovetter, E Eldar & Y Niv (2015) – *Attention-based learning deficits in individuals with autism suggest constitutively elevated norepinephrine levels* – Society for Neuroscience

SCY Chan, KA Norman & Y Niv (2015) – *Neural representations of posterior distributions over latent causes* – RLDM2015, Alberta CA

R Daniel, A Radulescu & Y Niv (2015) – *Learning in multidimensional environments: Computational and neural processes across the lifespan* – RLDM2015, Alberta CA

NW Schuck & Y Niv (2015) – *Human orbitofrontal cortex represents a cognitive map of state space* – RLDM2015, Alberta CA

GB Hermsdorff & Y Niv (2015) – *Modeling the hemodynamic response function for prediction errors in the human striatum* – RLDM2015, Alberta CA

A Langdon & Y Niv (2015) – *A learning mechanism for variance sensitive reinforcement learning* – RLDM2015, Alberta CA

A Geana & Y Niv (2015) – *Model comparison via real-time manipulation of human learning* –

RLDM2015, Alberta CA

YC Leong, R Daniel, A Radulescu, V DeWoskin & Y Niv (2015) – *Dynamic interaction between reinforcement learning and attention in multidimensional environments* – 5th Annual Interdisciplinary Symposium on Decision Neuroscience, Boston, MA

SCY Chan, KA Norman & Y Niv (2015) – *The neural representation of posterior distributions over hidden variables* – COSYNE 2014: Computational and Systems Neuroscience, Salt Lake City, Utah

2014 **RC Wilson & Y Niv (2014)** – *Is model fitting necessary for model-based fMRI?* – Society for Neuroscience Abstracts 40:457.06

R Daniel, A Radulescu & Y Niv (2014) – *Impaired learning in multidimensional environments in healthy human aging* – Society for Neuroscience Abstracts 40:88.06

SCY Chan, Y Niv & KA Norman (2014) – *Posterior distributions over hidden variables: Schemas in the brain* – Society for Neuroscience Abstracts 40:741.05

MM Botvinick, C Diuk, D Yee, J Cheong, A Weinstein, Y Niv & A Barto (2014) – *A general form for state-space representations in frontal and temporal cortex* – Society for Neuroscience Abstracts 40:555.19

SCY Chan, NW Schuck, N Lopatina & Y Niv (2014) – *State prediction errors in the orbitofrontal cortex* – Society for Neuroeconomics (oral presentation), Miami, FL

E Eldar & Y Niv (2014) – *The interaction between learning and mood*, Society of Cognitive Neuroscience Meeting, Boston, MA

YC Leong, R Daniel, A Radulescu & Y Niv (2014) – *Behavioral and neural correlates of attentional control during learning*, Society of Cognitive Neuroscience Meeting, Boston, MA

SCY Chan, C Nist-Lund, Y Niv & KA Norman (2014) – *Temporal context as a posterior distribution over latent states* – Context and Episodic Memory Symposium, Philadelphia, PA

E Eldar & Y Niv (2014) – *The interaction between learning and mood*, COSYNE 2014: Computational and Systems Neuroscience, Salt Lake City, Utah

D Arkadir, A Radulescu, D Raymond, S Bressman, P Mazzoni & Y Niv (2014) – *A link between corticostriatal plasticity and risk taking in humans*, COSYNE 2014: Computational and Systems Neuroscience, Salt Lake City, Utah

2013 **SJ Gershman, CE Jones, KA Norman, MH Monfils & Y Niv (2013)** – *Gradual extinction prevents the return of fear*, Society for Neuroscience Abstracts 39:99.06

JW Kanen, SJ Gershman, MH Monfils, EA Phelps & Y Niv (2013) – *Can gradual extinction prevent the return of fear in humans?*, Society for Neuroscience Abstracts 39:99.07

A Auchter, LK Cormack, Y Niv & MH Monfils (2013) – *Reconsolidation-extinction interactions in fear memory attenuation: examining the role of inter-trial interval variability*, Society for Neuroscience Abstracts 39:93.04

SCY Chan, N Lopatina & Y Niv (2013) – *“Identity prediction errors” and model-based learning* – RLDM2013, Princeton, NJ

R Daniel, V DeWoskin, YC Leong, A Radulescu & Y Niv (2013) – *Humans employ selective attention when learning in complex environments: evidence from computational modeling and neuroimaging* – RLDM2013, Princeton, NJ

- E Eldar & Y Niv (2013)** – *A reinforcement learning theory of mood instability* – RLDM2013, Princeton, NJ
- YC Leong & Y Niv (2013)** – *Human reinforcement learning processes act on learned attentionally-filtered representations of the world* – RLDM2013, Princeton, NJ
- A Radulescu, R Daniel & Y Niv (2013)** – *Age-related Differences in Learning to Selectively Attend* – RLDM2013, Princeton, NJ
- RC Wilson & Y Niv (2013)** – *Is model fitting necessary for model-based fMRI?* – RLDM2013, Princeton, NJ
- A Solway, C Diuk, NI Cordova, D Yee, AG Barto, Y Niv & MM Botvinick (2013)** – *Optimal task decomposition* – RLDM2013, Princeton, NJ
- 2012 **E Eldar, A Radulescu, Y Niv & JD Cohen (2012)** – *Norepinephrine, neural gain, and "first one wins" network dynamics* – COSYNE 2012: Computational and Systems Neuroscience, Salt Lake City, Utah
- C Diuk, D Yee, JJF Ribas-Fernandes, N Cordova, A Schapiro, Y Niv & MM Botvinick (2012)** – *Divide and conquer: Task decomposition in humans* – Society for Neuroscience Abstracts 38:592.20
- E Eldar & Y Niv (2012)** – *Learning about what you learn best: norepinephrine, neural gain, and local processing* – Society for Neuroscience Abstracts 38:592.11
- A Geana & Y Niv (2012)** – *Do we pay attention to the forest or the trees? A comparison of learning models using real-time task design* – Society for Neuroscience Abstracts
- Y Leong & Y Niv (2012)** – *The role of selective attention in learning* – Society for Neuroscience Abstracts 38:592.12
- A Radulescu & Y Niv (2012)** – *Age related differences in learning to selectively attend* – Society for Neuroscience Abstracts 38:592.15
- RC Wilson, YK Takahashi, G Schoenbaum & Y Niv (2012)** – *Orbitofrontal cortex as a cognitive map of task space: implications for reversal learning and extinction* – Society for Neuroscience Abstracts 38:289.17
- 2011 **C Diuk, MM Botvinick & Y Niv (2011)** – *Two coincident but separable prediction errors in human ventral striatum* – Society for Neuroscience Abstracts 37:827.14
- 2010 **C Diuk, A Barto, MM Botvinick & Y Niv (2010)** – *Hierarchical Reinforcement Learning: An fMRI Study of learning in a two-level gambling task* – Society for Neuroscience Abstracts 36:907.13
- MA McDannald, F Lucantonio, KA Burke, Y Niv & G Schoenbaum (2010)** – *Different critical roles for ventral striatum and orbitofrontal cortex in learning driven by changes in value versus identity* – Society for Neuroscience Abstracts 36:707.8
- Y Niv & SJ Gershman (2010)** – *Representation learning and reinforcement learning: An fMRI study of learning to selectively attend* – Society for Neuroscience Abstracts 36:907.15
- N Lopatina, T Thamrongtannarit, G Schoenbaum & Y Niv (2010)** – *Human learning in a transreinforcer blocking paradigm* – Pavlovian Society Meeting, Baltimore, Maryland
- YK Takahashi, MR Roesch, RC Wilson, Y Niv, K Toreson, P O'Donnell & G Schoenbaum (2010)** – *Orbitofrontal cortex is required for expectancy-related changes in phasic firing*

of midbrain dopamine neurons – Society for Neuroscience Abstracts 36:404.1

MT Todd, Y Niv & JD Cohen (2010) – *Identifying internal representations of context in fMRI* – Society for Neuroscience Abstracts 36

RC Wilson, JD Cohen & Y Niv (2010) – *Inferring relevance in a changing world* – Society for Neuroscience Abstracts 36:907.12

RC Wilson, YK Takahashi, MR Roesch, T Stalnaker, G Schoenbaum & Y Niv (2010) – *A Computational Model of the Role of Orbitofrontal Cortex and Ventral Striatum in Signalling Reward Expectancy in Reinforcement Learning* – Society for Neuroscience Abstracts 36:404.1

A Christakou, S Gershman, Y Niv, M Brammer & K Rubia (2010) – *Temporal Difference Modeling of Decision-making Under Ambiguity: Application in Adolescent Development* – Motivational and Cognitive Control Meeting, June 2010, Oxford, UK

2009 **S Gershman, D Blei & Y Niv (2009, talk)** – *An Infinite Mixture Model of Context-dependent Learning and Extinction* – COSYNE 2009: Computational and Systems Neuroscience, Salt Lake City, Utah

J Fernandes, J McGuire, Y Niv & MM Botvinick (2010) – *Neural correlates of hierarchical reinforcement learning: An fMRI study* – Society for Neuroscience Abstracts 35:102.16

2008 **Y Niv, J Edlund, P Dayan & JP O'Doherty (2008, talk)** – *Neural prediction errors reveal risk sensitivity in instrumental choice* – Israeli Human Brain Mapping 2008, Tel Aviv, Israel

Y Niv, P Dayan & JP O'Doherty (2008, poster and spotlight presentation) – *Decision making: Neural prediction errors show risk sensitivity* – COSYNE 2008: Computational and Systems Neuroscience, Salt Lake City, Utah

2007 **D Schiller, Y Niv, I Levy, JE LeDoux & EA Phelps (2007, poster and featured short presentation)** – *Reversal of fear learning in the human brain* – Linking Affect to Action: Critical Contributions of the Orbitofrontal Cortex, NYAS Symposium, New York, NY

2006 **Y Niv, JA Edlund, P Dayan & JP O'Doherty (2006, poster)** – *Neural correlates of risk sensitivity: An fMRI study of instrumental choice behavior* – Society for Neuroscience Abstracts 32:664.8, Atlanta, Georgia

2005 **Y Niv, ND Daw & P Dayan (2005, poster)** – *The effects of motivation on rates of responding: A reinforcement learning approach* – European Brain and Behavior Society Meeting, Dublin, Ireland

Y Niv, P Dayan & D Joel (2005, talk) – *The effects of motivation on habitual behavior* – Associative Learning Symposium 2005, Gregynog, Wales

Y Niv, ND Daw, D Joel & P Dayan (2005, poster) – *Motivational effects on behavior: Towards a reinforcement learning model of rates of responding* – COSYNE 2005: Computational and Systems Neuroscience, Salt Lake City, Utah

ND Daw, Y Niv & P Dayan (2005, talk) – *Uncertainty-based competition between prefrontal and striatal systems for behavioural control* – COSYNE 2005: Computational and Systems Neuroscience, Salt Lake City, Utah

2004 **Y Niv, MO Duff & P Dayan (2004, poster)** – *Asymmetric coding of temporal difference errors: Implications for dopamine firing patterns* - IBAGS VIII: The 8th Triennial Meeting of the International Basal Ganglia Society, Crieff, Scotland

Y Niv, MO Duff & P Dayan (2004, talk) – *Dopamine, uncertainty and TD learning* -

CNS2004: The 13th Annual Computational Neuroscience Meeting, Baltimore, Maryland

Y Niv, MO Duff & P Dayan (2004,talk) - *The effects of uncertainty on TD learning* - COSYNE 2004: Computational and Systems Neuroscience, New York, NY

2001 **Y Niv, D Joel, I Meilijson & E Ruppin (2001)** – *Evolution of reinforcement learning in uncertain environments: Emergence of risk aversion and probability matching* – In: J. Kelemen and P. Sosik eds., *Advances in Artificial Life - Proceedings of the 6th European Conference, ECAL 2001*, Prague, 252-261

Theses

2007 **PhD Thesis – Interdisciplinary Center for Neural Computation, The Hebrew University of Jerusalem:** *The effects of motivation on habitual instrumental behavior*

2001 **MA Thesis – Psychology Department, Tel Aviv University:** *Evolution of Reinforcement Learning in Uncertain Environments*

Workshops/Conferences organized

2019 **SfN Virtual Conference on Mitigating Bias** – January (co-organizers Ione Fine and Alicia Izquierdo)

2016 **FENS Brain meeting: New insights into psychiatric disorders through computational, biological and developmental approaches** – September 25-28, Copenhagen, Denmark (co-organizers John Krystal and Oscar Marin)

2016 **Addiction, in theory** – May 10-12, London, UK (co-organizers: Peter Dayan, Geoff Schoenbaum)

2015 **The 2nd Multidisciplinary conference on Reinforcement Learning and Decision Making (RLDM2015)** – June 7-10, Edmonton, Alberta, CA – General Chair (co-organizers: Satinder Singh, Peter Dayan, Rich Sutton, Susan Murphy, Nicholas Roy)

2013 **The 1st Multidisciplinary conference on Reinforcement Learning and Decision Making (RLDM2013)** – Oct 24-27, Princeton, New Jersey (co-organizers: Satinder Singh, Peter Dayan, Rich Sutton, Elizabeth Phelps, Nicholas Roy)

2012 **“Rumelhart Symposium” in honor of Peter Dayan at CogSci2012** – The annual meeting of the Cognitive Science Society, August 1-4 2012, Sapporo, Japan (co-organizer: Nathaniel Daw)

2010 **“Batsheva Seminar on Reward and Decision Making in the Brain”**, February 16-20, Jerusalem, Israel (co-organizers: Hagai Bergman, Daphna Joel)

2007 **NIPS Workshop: “Hierarchical organization of behavior: Computational, psychological and neural perspectives”**, December 7-8 (co-organizers: Matthew Botvinick and Andrew Barto)

2005 **Gatsby Foundation Workshop: “Motivation and action selection”**, June 20-22 (co-organizers: Nathaniel Daw and Peter Dayan)

Invited talks/Seminars (past and planned future)

2020 **Associative Learning Symposium** – Nick Mackintosh Memorial lecturer (April 2020, Gregynog, UK)

2019 **École Normale Supérieure, Group for Neural Theory** – Invited seminar speaker (Oct 2019,

Paris)

7th International Symposium on Motivational and Cognitive Control (MCC 2019) – Invited speaker (Sep 2019, Berlin)

Simons Collaboration on the Global Brain (SCGB) Annual Meeting – Keynote speaker (Sep 2019, New York)

American Psychiatric Association (APA) Annual Meeting – Invited speaker in 175th Anniversary History of Psychiatry Session on “Shaping the future of psychiatry: breakthroughs in research and delivery of clinical care (Looking ahead)” organized by Dr. Joshua Gordon (NIMH) (May 2019, San Francisco)

Society of Biological Psychiatry 74th Annual Meeting – Plenary speaker (May 2019, Chicago)

EMBO/EMBL Symposium “Probing neural dynamics with behavioral genetics” – Invited speaker (April 2019, Heidelberg, Germany)

Israeli Society of Biological Psychiatry (ISBP) – Plenary speaker (March 2019, Kfar Blum)

International Convention of Psychological Science (ICPS) – Invited speaker (March 2019, Paris, France)

Donders Institute of Brain, Cognition and Behaviour – Keynote lecturer (Feb 2019, Nijmegen, Netherlands)

Weizmann Institute, Neurobiology Department Colloquium Series – Invited speaker (Feb 2019, Rehovot, Israel)

ELSC “Deep Learning and the Brain” Symposium – Invited speaker (Jan 2018, Jerusalem)

Research Forum, Beer Yaakov Mental Health Hospital – Invited speaker (Jan 2019, Beer Yaakov, Israel)

2018

Hebrew University, Edmond and Lily Safra Center for Brain Sciences (ELSC) Seminar Series – Invited speaker (Dec 2018, Jerusalem, Israel)

Grand Rounds, Geha Mental Health Hospital – Invited speaker (Nov 2018, Petach Tikva, Israel)

Tel Aviv University – Psychology Department Colloquium – Invited speaker (Nov 2018, Tel Aviv, Israel)

Transcontinental Computational Psychiatry Workgroup (TCPW) – Invited speaker (August 2018)

European Behavioural Pharmacology Society workshop – Animal and human behavior: Using computational approaches to build a two-way bridge – Invited speaker (July 2018, Cambridge, UK)

Neurobiology of Cognition Gordon Research Conference – Invited speaker (July 2018)

Australian Learning Group Meeting – Keynote speaker (July 2018, Sydney)

Columbia University – Clinical, Cognitive, and Computational Neuroscience (C3N) Seminar – Invited seminar (June 2018)

Lehigh University – Invited keynote (May 2018)

Gatsby Computational Neuroscience Unit – Invited seminar (May 2018)

- Society for Biological Psychiatry Annual Meeting** – Invited workshop speaker (May 2018)
- Society for Biological Psychiatry Annual Meeting, Computational Psychiatry Satellite** – Invited speaker (May 2018)
- Society for Affective Science** – Invited “What is value?” panel speaker (April 2018)
- Rutgers University, Cognitive Science Colloquium** – Invited seminar (February 2018)
- 2017 **Dutch Psychonomics Society conference** – Keynote speaker (Dec 2017)
- Neural Information Processing Systems (NIPS)** – Keynote speaker (Dec 2017)
- Carnegie Mellon University, Psychology Department Colloquium** – Invited speaker (Nov 2017)
- Computational Psychiatry: A didactic introduction** – Invited speaker (Nov 2017)
- Society for Neuroscience Annual Meeting** – Invited Special Lecture (Nov 2017)
- The Brain Prize Meeting 2017: “Rewarding Neuroscience”** – Keynote speaker (Oct 2017, Funen, Denmark)
- Grand Rounds at Princeton House** – Invited speaker (Sep 2017)
- Cognitive Computational Neuroscience (CCN) meeting** – Plenary speaker in inaugural meeting (Sep 2017, New York)
- NIDA/NIAAA Cutting Edge Seminar Series** – Invited speaker (August 2017)
- Kavli Summer Institute in Cognitive Neuroscience** – Invited speaker (July 2017)
- Reinforcement Learning and Decision Making (RLDM) conference** – Invited speaker (June 2017, Ann Arbor, MI)
- Tel Aviv University, Chemistry Department** – Invited lecture on women in science (May 2017)
- Weizmann Institute, Department of Neuroscience** – Invited speaker (May 2017)
- Cognitive improvement: approaches, mechanisms and applications meeting** – Invited speaker (May 2017, Bar Ilan University, Israel)
- Stanford Neuroscience Institute Seminar Series** – Invited speaker (May 2017)
- UC Berkeley, Psychology Department Edwin Ghiselli lecture** – Invited speaker (May 2017)
- UT Austin Psychology Department Seminar Series** – Invited speaker (January 2017)
- Mount Sinai Diversity in Neuroscience Series** – Invited speaker (January 2017)
- 2016 **3rd Annual Symposium of Brain Imaging Center (BIC), Icahn School of Medicine at Mount Sinai** – Invited speaker (Oct 2016)
- Rochester Conte Center Symposium: Persistent, maladaptive behaviors: why we make bad choices** – Invited speaker (Oct 2016)
- Advanced Course in Computational Neuroscience (ACCN), Lisbon, Portugal** – Invited speaker (August 2016)
- RIKEN Brain Science Institute Summer Program** – Invited speaker (June 2016)
- Icahn School of Medicine at Mount Sinai Psychiatry Grand Rounds** – Invited speaker (May 2016)

- Social & Affective Neuroscience Society (SANS) Annual Conference** – Invited anchor talk (Apr 2016)
- Berlin School of Mind and Brain** – Invited speaker (March 2016)
- Harvard Center for Brain Science Seminar Series** – Invited speaker (Feb 2016)
- UCLA Joint Seminar in Neuroscience** – Invited speaker (Jan 2016)
- 2015 **Third Quadrennial Meeting on Orbitofrontal Cortex Function** – Invited speaker (Sep 2015)
- Ernst Strüngmann Forum: Computational Psychiatry: What Can Theoretical Neuroscience and Psychiatry Teach Each Other?** – Invited participant (June 2015)
- Austin Conference on Learning and Memory** – Invited speaker (April 2015)
- Decision Neuroscience of Aging Conference** – Invited speaker & workshop leader (March 2015)
- Columbia University** – Decision Neuroeconomics seminar series – Invited talk (February 2015)
- Yale University** – Current Works in Behavior, Genetics, and Neuroscience talk series – Invited talk (February 2015)
- 2014 **Indiana University** – Cognitive Science Colloquium Series and Program in Neuroscience joint invitation – Invited talk (November 2014)
- University of Washington** – Psychology Department – Invited Loucks lecturer (October 2014)
- UCSD** – Cognitive Neural Systems Seminar – Invited talk (October 2014)
- Duke University** – Cognitive neuroscience colloquium – Invited talk (October 2014)
- Second MPS-UCL Symposium and Advanced Course on Computational Psychiatry and Ageing Research** – Invited keynote lecture on Representation Learning (September 2014)
- Gordon Research Conference: Neurobiology of Cognition** – Invited speaker (July 2014)
- Cold Spring Harbor Laboratory Symposium on Cognition** – Invited speaker (May 2014)
- Brown University Neuroscience Program Seminar Series** – Invited talk (May 2014)
- NYU Center for Neuroeconomics, Neuroeconomics colloquium** – Invited talk (April 2014)
- Computational Systems Neuroscience (COSYNE) 2014** – Invited speaker (Feb 2014)
- 2013 **MIT** – Vision and learning course (Tommaso Poggio & Shimon Ullman) – Invited guest lecturer (November 2013)
- Albert Einstein College of Medicine** – Neuroscience Department Seminar Series – Invited talk (September 2013)
- UCL Emotion club (Raymond Dolan)** – Invited talk (September 2013)
- Boston University** – CompNet workshop on prediction errors in cognition – Invited speaker (July 2013)
- Third Symposium on the Biology of Decision Making** – Paris, France – Invited speaker (May 2013)

- MIT – Brain and Cognitive Sciences – Invited talk (March 2013)
- Tamagawa–Caltech Reward and Decision Making on Risk and Aversion Meeting** – Hawaii – Invited speaker (March 2013)
- 3rd International Conference on Applications of Neuroimaging to Alcoholism** – Yale University – Invited speaker (February 2013)
- Weill Medical College of Cornell University** – Sackler Science speaker series – Invited talk (Jan 2013)
- 2012 **Workshop 2: Cognitive Neuroscience** – Invited speaker (December 2012)
- Neural Computation: From Perception to Cognitive Function, Berlin** – Invited speaker (Oct 2012)
- Annual meeting of the Society for Neuroeconomics** – Invited workshop speaker (September 2012)
- ESF Workshop on “Motivation and Action”, Copenhagen** – Invited speaker (August 2012)
- Washington University, St. Louis** – Cognitive, Computational and Systems Neuroscience (CCSN) Invited lecturer (May 2012)
- NIDA** – Invited talk (May 2012)
- NIH/NINDS** – Invited talk (May 2012)
- TEDxRutgers** – Invited talk “How do we make decisions” (April 2012)
- University of Michigan, Ann Arbor** – Biopsychology Colloquium series – Invited talk (April 2012)
- Stanford Mind Brain and Computation symposium** – “Reinforcement learning: Computational roles for dopamine, striatum, and hippocampus” – Invited speaker (Feb 2012)
- 2011 **NYU** – Memory in Brain Lecture Series – Invited talk (October 2011)
- Columbia University** – Cognitive Lunch Series – Invited talk (September 2011)
- Gordon Conference on Eye Movements** – Invited speaker (August 2011)
- Workshop on the Neuroscience and Psychophysiology of Experience-Based Decisions** – Technion University – Invited speaker (June 2011)
- Association for Behavioral Analysis International (ABAI) annual convention, B. F. Skinner Lecture Series** – Invited speaker – “Learning latent structure” (May 2011)
- Computational Systems Neuroscience (COSYNE) 2011** – Attention, reinforcement learning and reward workshop – Invited workshop speaker
- Winter Conference on Brain Research** – Invited speaker in symposium on “Two brains are better than one: Multiple learning systems for economic decision making”
- Winter Conference on Brain Research** – Invited speaker in symposium on “How do we learn what outcomes to expect from a decision? Investigations into the neural circuits mediating model-based learning about reward value versus identity”
- 2010 **University of Pennsylvania** – Institute for Research in Cognitive Science Colloquium Series – Invited talk (December 2010)

- University of Rochester, Department of Brain and Cognitive Science** – BCS Colloquium Series – Invited talk (September 2010)
- UCL** – Functional Imaging Lab Brain Meeting series – Invited talk (May 2010)
- Computations, Decisions, and Movement Meeting** – Rauischholzhausen Castle, Germany – Invited speaker (May 2010)
- Carnegie Mellon University, School of Computer Science** – Intelligence Seminar Series – Invited talk (March 2010)
- 2009 **Sloan-Swartz Annual Meeting on Theoretical Neuroscience** – Invited feature presentation on “Model-driven studies of learning and decision making” (July 2009)
- The 26th International Conference on Machine Learning** – Invited tutorial on “The Neuroscience of Reinforcement learning” (June 2009)
- Yale University School of Medicine** – Invited talk (February 2009)
- 2008 **NIPS 2008 Workshop: Machine learning meets human learning** – Invited speaker (December 2008)
- NIPS 2008 Minisymposium: Principled theoretical frameworks for the perception-action cycle** – Invited speaker (December 2008)
- University of Minnesota, Center for Cognitive Sciences colloquium series** – Invited talk (Nov 2008)
- Workshop on Open Problems in Neuroscience of Decision Making** – Invited speaker (October 2008, Okinawa, Japan)
- International Symposium on Drug Addiction: Mechanisms and Therapeutic Approaches** – Invited speaker (October 2008, Kunming, China)
- Technion, Industrial Engineering Department** – Invited talk (August 2008)
- Technion, Biological Networks Group** – Invited talk (July 2008)
- Annual Meeting of the Society for the Neural Control of Movement** – Invited speaker (May 2008)
- Barbados workshop on Fast Reinforcement Learning** – Invited speaker (April 2008)
- Neural circuits and decision making in rodents** – Invited speaker (April 2008, Janelia Farm)
- Columbia University, Neurotheory Seminar Series** – Invited talk (February 2008)
- 2007 **Caltech, BMS seminar series** – Invited talk (November 2007)
- Hofstra University, Computer Science Department** – Invited talk (October 2007)
- Champalimaud Neuroscience Workshop on “Neural bases of reward and decision making”** – Invited speaker (September 2007, Lisbon, Portugal)
- Neurofinance symposium on “The neural bases for human decision making under uncertainty”** – Invited speaker (July 2007, University of Zurich)
- University of Maryland, Schoenbaum/O’Donnell Systems journal club** – Invited talk (May 2007)
- 2006 **NYU Neuroeconomics seminar series** – Invited talk (November 2006)
- Cambridge University, Psychology department** – Invited talk (July 2006)

- Reward and decision making in cortico-basal ganglia networks – Invited speaker (June 2006, Lake Arrowhead, CA)
- Choice and the Brain Symposium – Invited speaker (June 2006, Caltech)
- Weizmann Institute, Tsodyks Lab – Invited talk (April 2006)
- Course on “Schizophrenia: A systems neuroscience perspective,” Weizmann Institute – Invited guest lecture on “Dopamine and reward” (April 2006)
- University of Oxford, Rushworth Lab – Invited talk (January 2006)
- 2005 Baylor College of Medicine, Montague Lab – Invited talk (November 2005)
- Computational Cognitive Neuroscience Conference – Invited speaker (November 2005)
- NYU, Phelps Lab – Invited talk (November 2005)
- 2004 NYU, Glimcher-Heeger Lab meeting – Invited talk (July 2004)
- 2003 Tel Aviv University, Psychology department colloquium – Invited talk (February 2003)
- 2001 The Hebrew University of Jerusalem, Beehave group – Invited talk (January 2001)
- Panel series in neurosciences: A Multidisciplinary Overview of Brain Research – The Adams Super Center for Brain Research, Tel Aviv University – Invited talk (January 2001)
- 2000 EPFL – Floreano Lab – Invited talk (October 2000)
- University of Bern, Computational neuroscience colloquium – Invited talk (October 2000)
- Haifa University, Computer science colloquium – Invited talk (May 2000)

Teaching

- Fall 2017 Princeton University, FRS147 – “Reinforcement learning and decision making,” Freshman Seminar
- yearly since 2010 Princeton University, Neuroscience Institute – NEU501 – lecturer in “Learning & Memory” module in team-taught graduate core course (formerly “Learning” module in NEU502)
- biyearly since 2011 Princeton University, NEU202/PSY259 – “Introduction to Cognitive Neuroscience” (course required for NEU major)
- biyearly since 2009 Princeton University, Psychology Department – NEU/PSY338 – “Animal learning and decision making: psychological, computational and neural perspectives”
- Spring 2014 Princeton University, Neuroscience Institute & Psychology Department – NEU/PSY425 – “Neuroeconomics” (advanced undergraduate and graduate seminar)
- August 2017 Summer School in Neuroeconomics and Social Neuroscience, Duke University – invited lecturer
- July 2017 Kavli Summer Institute in Cognitive Neuroscience, UC Santa Barbara – invited lecturer
- August 2016 Advanced Course in Computational Neuroscience (ACCN), Lisbon, Portugal – invited lecturer
- June 2016 RIKEN Brain Science Institute Summer Program – invited lecturer
- June 2014 Okinawa Computational Neuroscience Course – invited lecturer “Advanced reinforcement learning”

- July 2012-13, 15-17 **Biophysics and Computation in Neurons and Networks (BCNN) Summer Course** – invited lecturer (<http://bcnn.princeton.edu>)
- Aug 2011, 2013 **Methods in Computational Neuroscience Summer Course (Woods Hole)** – invited lecturer (“Reinforcement Learning”)
- April 2009 **Programme Gulbenkian Champalimaud Neuroscience Course on Basal Ganglia, Reinforcement and Reward**, invited lecturer.
- 2009 **Hebrew University, Interdisciplinary Center for Neural Computation** – “Reinforcement learning: neural, behavioral, and computational approaches” (with Nathaniel Daw, Hagai Bergman)
- Aug 2008, Aug 2009 **Advanced Course in Computational Neuroscience**, Freiburg, Germany – “Reinforcement learning”, invited lecturer
- May 2008 **Programme Gulbenkian Champalimaud Neuroscience Course on Reinforcement Learning** – “Neural Reinforcement learning: Dopamine and reward”, invited lecturer
- 2008 **Hebrew University, Interdisciplinary Center for Neural Computation** – Mini course on “Reinforcement Learning and Decision Making” (with Nathaniel Daw)
- 2006 **Hebrew University, Interdisciplinary Center for Neural Computation** – “Introduction to Learning and Behavior: Conditioning and the Brain” (graduate course). Novel course that brought together psychological theories on animal conditioning, computational models, and their neural substrates
- July 2005 **Okinawa Computational Neuroscience Course, *Predictions and Decisions*** – Tutor, Computational Modeling. <http://www.irp.oist.jp/ocnc/2005/projects/modeling/niv.html>
- 2003 **Hebrew University, Interdisciplinary Center for Neural Computation** – Lecturer in graduate course “Introduction to Learning and Behavior”.
- 1999-2000 **Tel-Aviv University, department of psychology** – Teaching Assistant in undergraduate seminar “Modeling of Rats' Spatial Behavior”.
- 1994-1996 **Guide in the Society for the Preservation of Nature in Israel**. Nature classes for elementary school children, guide of youth and family field trips

Mentoring

- Graduate students
- Samuel Zorowitz** – second year student (PNI), jointly supervised by Nathaniel Daw
 - Mingyu Song** – third year student (PNI)
 - Nicole Drummond** – fourth year student (PNI)
 - Angela Radulescu** – fifth year student (Psychology)
 - Nina Rouhani** – fifth year student (Psychology)
 - Gecia Hermsdorff** – sixth year student (PNI)
 - Yeon Soon Shin** – fifth year student (PNI), jointly supervised by Kenneth Norman
 - Stephanie Chan** – graduated 2015, jointly supervised by Kenneth Norman, Google AI Intern
 - Andra Geana** – graduated 2015, jointly supervised by Jonathan Cohen, postdoctoral fellow at Brown University (Supervisor: Michael Frank)
 - Eran Eldar** – graduated 2014, postdoctoral fellow at the Max Planck/UCL Centre for Computational Psychiatry at UCL (Supervisor: Raymond Dolan)
 - Samuel J Gershman** – graduated 2013, jointly supervised by Kenneth Norman, postdoctoral fellow at MIT (Josh Tenenbaum), Assistant professor at Harvard since 2015

Michael T Todd – graduated 2013, jointly supervised by Jonathan Cohen, postdoctoral fellow at Berkeley (Mark D’Esposito), currently working at Google DeepMind

Post-
doctoral
fellows

Daniel Bennett – PhD University of Melbourne

Angela Langdon – PhD University of Sydney

Mingbo Cai – PhD Baylor College of Medicine

Sarah DuBrow – PhD NYU, PI at U Oregon since 2019

Melissa Sharpe – PhD University of New South Wales, PI at UCLA since 2018

Nicholas Schuck – PhD University of Berlin, PI at Max Planck Berlin since 2017

Reka Daniel – PhD University of Magdeburg, data scientist at Weight Watchers

Robert Wilson – PhD University of Pennsylvania, PI at U Arizona, Tuscon, since 2015

Carlos Diuk – PhD Rutgers University, jointly supervised by Matthew Botvinick, data scientist at Facebook

Research
assistants

Valkyrie Felso – current research assistant and lab manager

Katharine Holmes – currently training for the 2020 Olympics games (fencing team)

Angela Radulescu – currently graduate student in my lab

Yuan Chang Leong – currently graduate student at Stanford (supervisor: Jamil Zaki)

Nina Lopatina – currently data scientist at In-Q-Tel after doing her graduate work with Geoff Schoenbaum and postdoc with Joni Wallis

Graduate thesis committees

Present: Felicia Zhang (Advisor: Lauren Emberson, PSY) – thesis proposal committee
Lili Cai (Advisor: Ilana Witten, PNI) – thesis committee
Peter Hitchcock (Advisor: Chris Sims, Drexel University) – thesis committee
Heather Wied (Advisor: Geoffrey Schoenbaum, NIDA) – thesis committee

Past: DongWon Oh (Advisor: Alex Todorov, PSY) – thesis proposal committee
Joel Finkelstein (Advisors: Ilana Witten, Yael Niv, PSY) – thesis proposal committee
Sam McDougal (Advisors: Jordan Taylor, Yael Niv, PSY) – thesis & reading committee
Olga Lositsky (Advisors: Jonathan Cohen, Ken Norman, PNI) – thesis committee 2017
Ariana Strandburg-Peshkin (Advisor: Iain Couzin EEB) – thesis committee 2016
Alec Solway (Advisor: Matthew Botvinick, PNI) – thesis committee 2013
Dominic Kao (Advisor: Yael Niv, CS) – MSE thesis committee 2012
Bingni Brunton (Advisor: Carlos Brody, MOL) – thesis committee & thesis reader, 2012
Adam Moore (Advisors: Andrew Conway & Jon Cohen, PSY) – thesis committee, 2011
Susan McDuff (Advisor: Kenneth Norman, PSY) – dissertation oral committee, 2009
Tan Lee (Advisor: Susan Fiske, PSY) – thesis oral committee, 2010
Umar Syed (Advisor: Rob Schapire, COS) – nonreader thesis committee, 2010

Undergraduate senior thesis advising

Present: Claire Lee (PNI, junior and senior advising, 2018-2019)
Ien Li (PNI, junior and senior advising, 2018-2019)

Past: Julie Newman (PNI, junior and senior advising, 2017-2018)
Riley MacAulay (PNI, junior and senior advising, 2017-2018)
Nicholas Huang (PSY, senior advising, 2018)
Jennifer Bu (Psychology, junior and senior advising, 2016-2017)
Alana Jaskir (Computer Science independent work 2016-2017)
Andrew Schilling (PNI, junior and senior advising, 2016-2017)
Katharine Holmes (Psychology, senior thesis advising, 2016-2017)

Jessica Lee (Psychology, senior advising, 2015-2016)
 Kelsey McDonnald (Psychology & PNI, junior and senior advising, 2014-2015)
 Michael Grannovetter (Psychology & PNI, junior and senior advising, 2013-2015)
 Aaron Hauptman (Economics & PNI, secondary advisor, 2014-2015)
 Karin Tsai (Computer science independent work, 2010)
 Vivian DeWoskin (Psychology junior and senior thesis, 2010-2011)
 Alexander Tank (Molecular biology junior and senior thesis, 2010-2011)
 Yuan Chang Leong (Psychology senior thesis, 2012-2013)
 Momchil Tomov (Computer science independent work, 2013)
 Katya Dombrowski (Psychology senior thesis, 2013-2014)
 Lauren Song (EEB, secondary advisor, 2013-2014)

Other committees/Advisory boards

from 2018 NIMH Advisory Council member
 from 2018 Editorial Board member: *Journal of Neuroscience, Psychology, and Economics*
 from 2017 Editorial Board member: *Current Opinion in Behavioral Sciences*
 from 2016 Editorial Board member: *Decision*
 from 2016 External Advisory Board member for Silvio O. Conte NIMH Center “*Neurocircuitry of OCD: Effects of Modulation*” (PI: Suzanne Haber)
 from 2016 Advisory Committee member for *Computational Cognitive Neuroscience* (CCN) conference
 2015-2017 Committee on Public Lectures, Princeton University, member (two-year appointment)
 from 2015 Consulting editor for *Psychological Review*; Editorial board member, *Journal of Computational Psychiatry* (new public-access journal published by MIT Press)
 from 2015 Faculty Advisor, Wilson College, Princeton University
 from 2015 Co-chair of graduate and postdoc professional development committee, PNI (with Tim Buschman)
 from 2014 Director of graduate admissions, PNI (2014: co-director with Matthew Botvinick)
 from 2013 Executive planning committee, Reinforcement Learning and Decision Making meeting (RLDM), General Chair for 2015 conference
 from 2013 Editorial board member: *Behavioral Neuroscience*
 from 2012 Curriculum committee member, PNI
 2012-2015 Elected board member: Society for Neuroeconomics, Program Committee in 2014
 2012-2014 Board member – Bowery Babes Inc., a nonprofit organization dedicated to supporting women from pregnancy through the early years of motherhood and beyond, and to protect and enrich downtown Manhattan as a place to raise a family. Chair of Education and Charitable Giving committees.
 2009,2013 Co-organizer, Princeton Neuroscience Institute annual retreat
 2012-2013 Organizing Committee – IBAGS XI (meeting of the International Basal Ganglia Society), March 3-7 2013, Eilat, Israel
 2010-2011 Faculty of 1000 contributing member – Theoretical & Computational Neuroscience
 2010 Co-Chair, Committee for Student Fellowships (Princeton Neuroscience Institute)

- 2010 Area Chair for NIPS2010 Program Committee
- 2009 Area Chair for NIPS2009 Program Committee; Program Committee for ICML/UAI/COLT Workshop on Abstraction in Reinforcement Learning
- From 2009 EU funded Integrated Project (contract n. ICT-231722) “IM-CLeVeR – Intrinsically Motivated Cumulative Learning Versatile Robots” – International Scientific Advisory Board
- 2009 Neuroscience program admissions committee