Yael Niv

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Affiliations

Since 2015	**Associate Professor,** Princeton Neuroscience Institute & Psychology Department, Princeton University
2008-2015	**Assistant Professor,** Princeton Neuroscience Institute & Psychology Department, Princeton University
2007-2008	**Princeton University** – Post-doctoral Fellow

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.
July 2004	**RIKEN BSI Lecture Course, *Learning and Memory***, Saitama, Japan
Aug 2001	**EU Advanced Course in *Computational Neuroscience***, Trieste, Italy
July 2000	**Neuromorphic Engineering Workshop**, Telluride, Colorado

Funding

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 (role: PI)
2012-2015	National Institute for Mental Health R01 – Neural and computational mechanisms of selective attention in experience based decision-making (role: PI)
2012-2015	Human Frontiers Science Program Organization (HFSPO) – The striatal cholinergic system and attention for learning: from neurotransmission to personality (role: co-PI with Jeff Wickens, Genela Morris, Anastasia Christakou)
2012-2015	NSF Collaborative Research in Computational Neuroscience (CRCNS) – Neural correlates of hierarchical reinforcement learning (role: co-PI with Matthew Botvinick and Andrew Barto)
2012-2015	Templeton Foundation – Toward a scientific understanding of the human capacity for cognitive control (role: co-I with Jonathan Cohen (PI), Matthew Botvinick, Kenneth Norman, Nicholas Turk-Browne)
2011-2015	Ellison Medical Foundation Scholar – Interactions between learning and attention throughout the lifespan (role: PI)
2011-2012	National Institute for Drug Abuse R03 – fMRI investigations of how we learn what is relevant for a decision (role: PI)

2010-2012	United States–Israel Binational Science Foundation – Neural correlates of multidimensional learning: dimensionality reduction in striatal representations (role: co-PI with Genela Morris)
2010-2014	Sloan Research Fellowship – Using advanced computational methods to understand learning (role: PI)
2010-2013	Oxford/Princeton Collaborative Research Grant – Mesolimbic dopamine and learning the value of risk (role: co-PI with Mark Walton)

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, "*How fast to work: Response vigor, motivation and tonic dopamine*"
2001-2004	Merit based scholarship, Interdisciplinary Center for Neural Computation
2004	Computational Neuroscience (CNS) best talk award, "*The Effects of Uncertainty on TD Learning*"
2004	Dan David Scholarship for PhD Graduate Students in the field of Brain Sciences
2003	EC Thematic Network Fellowship for short-term academic visit to the Gatsby Computational Neuroscience Unit, UCL
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 (under review/ revision)	**SCYC Chan, NW Schuck, N Lopatina, G Schoenbaum & Y Niv** – *Human orbitofrontal cortex encodes the multiple components of state prediction errors* – under revision at Nature Neuroscience
	SJ Gershman, KA Norman & Y Niv – *Discovering latent causes in reinforcement learning* – under review at Current Opinion in Behavioral Sciences
	E Eldar, Y Niv & JD Cohen – *Do you see the forest or the trees? Neural gain and integration during perceptual processing* – under revision at Psychological Science
	D Arkadir, A Radulescu, D Raymond, N Lubarr, SB Bressman, P Mazzoni & Y Niv – *A genetic movement disorder increases risk taking in humans* – under revision at Nature Neuroscience
2015	**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; doi:10.1523/JNEUROSCI.2978-14.2015
	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, doi:10.1101/sqb.2014.79.024851

RC Wilson & Y Niv (2015) – *Is model fitting necessary for model-based fMRI?* – PLoS Computational Biology 11(6): e1004237, doi:10.1371/journal. pcbi.1004237

SJ Gershman & Y Niv (2015) – *Novelty and inductive generalization in human reinforcement learning* –Topics in Cognitive Science 1-25, doi:10.1111/tops.12138

E Eldar & Y Niv (2015) – *Interaction between emotional state and learning underlies mood instability* – Nature Communications 6:6149, doi:10.1038/ncomms7149

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* – Front. Neurosci. 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 Cog. Sci. 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 Ruppin (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 Ruppin (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 Ruppin (2001)** – *Evolution of reinforcement learning in foraging bees: A simple explanation for risk averse behavior* – Neurocomputing 44(1), 951-956

Commentaries, chapters, technical reports

2015 **R Daniel, NW Schuck & Y Niv (2015)** – *How to divide and conquer the world, one step at a time* – PNAS

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: Bezard, 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

Abstracts

2015 **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 Thamrongrattanarit, 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

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)

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 on the 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 – Okinawa, Japan – Invited speaker (October 2008)

International Symposium on Drug Addiction: Mechanisms and Therapeutic Approaches – Kunming, China – Invited speaker (October 2008)

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 – Symposium on "How fast?" Trajectory control, movement energy, and the basal ganglia – Invited speaker (May 2008)

Barbados workshop on Fast Reinforcement Learning – Invited speaker (April 2008)

Neural circuits and decision making in rodents – Janelia Farm – Invited speaker (April 2008)

Columbia University – Neurotheory Seminar Series – Invited talk (February 2008)

2007 **Caltech – BMS seminar series – Invited talk (November 2007)**

Hofstra University – Computer Science – Invited talk, (October 2007)

Champalimaud Neuroscience Workshop on "Neural bases of reward and decision making" – Lisbon, Portugal – Invited speaker (September 2007)

Neurofinance symposium on "The neural bases for human decision making under uncertainty" – University of Zurich – Invited speaker (July 2007)

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 – Lake Arrowhead, California – Invited speker (June 2006)
	Choice and the Brain Symposium – Caltech – Invited speaker (June 2006)
	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

yearly since 2010	**Princeton University, Neuroscience Institute** – NEU502 – "Learning" module in team-taught graduate core course
biyearly since 2011	**Princeton University,** NEU/PSY259 – "Introduction to Cognitive Neuroscience"
Spring 2014	**Princeton University, Neuroscience Institute & Psychology Department** – NEU/PSY425 – "Neuroeconomics" (advanced undergraduate and graduate seminar)
2009, 2010, 2013	**Princeton University, Psychology Department** – NEU/PSY338 – "Animal learning and decision making: psychological, computational and neural perspectives" (advanced undergraduate course) http://www.princeton.edu/~yael/PSY338
June 2014	**Okinawa Computational Neuroscience Course** – invited lecturer "Advanced reinforcement learning"
July 2012, 2013	**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 Group. 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". Assistance to students in designing and modeling different aspects of rats' spatial behavior, using Matlab.
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	**Angela Radulescu** — first year student (psychology)
	Nina Rouhani — first year student (psychology)
	Gecia Hermsdorff — second year student (PNI), jointly supervised by Matthew Botvinick
	Andra Geana — fourth year student (psychology), jointly supervised by Jonathan Cohen
	Stephanie Chan — fifth year student (neuroscience), jointly supervised by Kenneth Norman
	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 fellowship with Josh Tenenbaum at MIT, commencing assistant professor position at Harvard, 2015
	Michael T Todd – graduated 2013, jointly supervised by Jonathan Cohen, postdoctoral fellowship with Mark D'Esposito at Berkeley, currently working at Netflix
Postdoctoral fellows	**Nicholas Schuck** — PhD University of Berlin
	Angela Langdon — PhD University of Sydney
	Reka Daniel — PhD University of Magdeburg
	Robert Wilson — PhD University of Pennsylvania, Currently assistant professor at University of Arizona, Tuscon
	Carlos Diuk — PhD Rutgers University, jointly supervised by Matthew Botvinick, currently at Facebook
Research assistants	**Katharine Holmes** — current research assistant, Princeton undergraduate on a two-year leave prior to senior year due to training for the Olympics games
	Angela Radulescu — currently graduate student in my lab
	Yuan Chang Leong — currently graduate student at Stanford (supervisor: Jamil Zaki)
	Nina Lopatina — currently graduate student at NIDA (supervisor: Geoffrey Schoenbaum)

Graduate thesis committees/General exam committees

Present:	Olga Lositsky (Advisors: Jonathan Cohen, Kenneth Norman, PNI) – thesis committee Ariana Strandburg-Peshkin (Advisor: Iain Couzin EEB) – general exam & thesis committee Joel Finkelstein (Advisors: Ilana Witten, Yael Niv, PSY) – thesis committee Sam McDougal (Advisors: Jordan Taylor, Yael Niv, PSY) – thesis committee Heather Wied (Advisor: Geoffrey Schoenbaum, NIDA) – thesis committee
Past:	Alec Solway (Advisor: Matthew Botvinick, PNI) – general exam comm. 2011; thesis committee 2013 Dominic Kao (Advisor: Yael Niv, CS) – MSE thesis committee, 2012 Bingni Brunton (Advisor: Carlos Brody, MOL) – thesis committee & thesis reader, 2012 Ryan Low (Advisor: David Tank, PNI) – general exam committee, 2011 Adam Moore (Advisors: Andrew Conway & Jonathan Cohen, PSY) – thesis committee, 2011 Susan McDuff (Advisor: Kenneth Norman, PSY) – dissertation oral committee, 2009 Stephanie Goldfarb (Advisor: Phil Holmes, MAE) – general exam 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:	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)
Past:	Karin Tsai (Computer science independent work, 2010) Vivian DeWoskin (Psychology junior and senior thesis, 2010-2011) Alexander Tank (Molecular biology junior independent work 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 2015	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 2014	Co-director of graduate admissions, PNI
2014-2015	Faculty fellow, Rockefeller Residential College, Princeton University
2012-current	Curriculum committee member, PNI
2013-current	Executive planning committee, Reinforcement Learning and Decision Making meeting (RLDM), General Chair for 2015 conference
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

Ad hoc reviewer

(alphabetical order)	Adaptive Behavior, Behavior and Brain Functions, Cerebral Cortex, Cognition, European Journal of Neuroscience, Frontiers in Computational Neuroscience, Frontiers in Integrative Neuroscience, Human Frontiers Science Program Organization (HFSPO), International Conference on Machine Learning (ICML), Journal of Computational Neuroscience, Journal of Mathematical Psychology, Journal of Neurophysiology, Journal of Neuroscience, Learning & Memory, Machine Learning, National Institutes of Health, National Science Foundation, Nature, Nature Neuroscience, Neural Computation, Neuroimage, Neuron, Neuroscience, Neural Information Processing Systems (NIPS), PLoS Computational Biology, Proceedings of the National Academy of Science (PNAS), Psychopharmacology, Reinforcement Learning and Decision Making (RLDM), Scholarpedia, Science, Trends in Cognitive Science