JONATHAN D. COHEN

CURRICULUM VITAE

Sections: *(click on section to navigate to it, and "Back to Sections" at the bottom of each page to return here)*

BIOGRAPHICAL

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EDUCATION and TRAINING

UNDERGRADUATE:

1973-77	Yale University	B.A., 1977	Biology and Philosophy

GRADUATE:

1979-83	University of Pennsylvania	M.D., 1983	Medicine
1987-90	Carnegie Mellon University	Ph.D., 1990	Cognitive Psychology

POST-GRADUATE:

1983-89 Internship in General Medicine, Neurology and Psychiatry
Residency in Psychiatry
Stanford University School of Medicine

1985-87 NIMH Research Training Fellowship,
Department of Psychiatry and Behavioral Sciences
Stanford University School of Medicine

APPOINTMENTS and POSITIONS

ACADEMIC:

1989-present	Assistant to Full Professor of Psychiatry Western Psychiatric Institute and Clinic University of Pittsburgh
1990-98	Assistant to Associate Professor of Psychology Carnegie Mellon University
1992-present	Director, Clinical Cognitive Neuroscience Laboratory University of Pittsburgh
1998-2005	Professor of Psychology, Princeton University
1999-2007	Founding Director, Center for the Study of Brain, Mind and Behavior Princeton University
2000-2008	Director, Program in Neuroscience Princeton University
2005-2012	Eugene Higgins Professor of Psychology, Princeton University
2005-present	Founding Co-Director, Princeton Neuroscience Institute
20012-present	Robert Bendheim and Lynn Bendheim Thoman Professor in Neuroscience Princeton University

MEDICAL LICENSURE

1983-2012	California (retired)
1986-present	Pennsylvania

HONORS and AWARDS

B.A. Cum Laude 1977
Distinction in the Biology Major

Distinction in the Philosophy Major
Yale University

Miller Foundation Prize for Research in Psychiatry 1986
Department of Psychiatry and Behavioral Sciences
Stanford University School of Medicine

Annual Resident Research Award 1986
Northern California Psychiatric Society

Joseph Zubin Memorial Fund Award for Research in Psychopathology 1993

Kempf Fund Award for Research Development in
Psychobiological Psychiatry, American Psychiatric Association 2000

James McKeen Cattell Fund Sabbatical Fellowship Award 2003

Eugene Higgins Chaired Professorship, Princeton University 2005

Salmon Award Lecturer, New York Academy of Medicine 2006

Fellow, Association for Psychological Science 2007

Edward J. Sachar Award, Columbia University School of Medicine 2007

American Psychological Association Distinguished Scientific Contribution Award 2010

Fellow, American Association for the Advancement of Science 2012

William James Fellow Award, Association for Psychological Science 2018

PUBLICATIONS

1. Peer-Reviewed Articles

Cohen JD, Van Putten T, Marder S, Berger PA & Stahl SM (1987). Treatment of the symptoms of schizophrenia with piquindone, a new atypical neuroleptic. Psychopharmacology Bulletin, 23(3), 514-518.

Cohen JD, Van Putten T, Marder S, Berger PA & Stahl SM. (1987). The efficacy of piquindone, a new atypical neuroleptic, in the treatment of the positive and the negative symptoms of schizophrenia. Journal of Clinical Psychopharmacology, 7(5), 324-329.

Cohen JD, Dunbar K & McClelland JL (1990). On the control of automatic processes: A parallel distributed processing model of the Stroop effect. Psychological Review, 97(3), 332-361.

Servan-Schreiber D, Printz H & Cohen JD (1990). A network model of catecholamine effects: Gain, signal-to-noise ratio, and behavior. Science, 249, 892-895.

Servan-Schreiber D & Cohen JD (1991). Models of neuromodulation and information processing deficits in schizophrenia. Revue Internationale de Psychopathologie, 1, 113-134

Cohen JD & Servan-Schreiber D (1992). Context, cortex and dopamine: A connectionist approach to behavior and biology in schizophrenia. Psychological Review, 99, 45-77.

Cohen JD, Servan-Schreiber D & McClelland JL (1992). A parallel distributed processing approach to automaticity. American Journal of Psychology, 105, 239-269.

Cohen JD, MacWhinney B, Flatt M & Provost J (1993). PsyScope: A new graphic interactive environment for designing psychology experiments. Behavioral Research Methods, Instruments & Computers, 25(2), 257-271.

Cohen JD, Noll DC & Schneider W (1993). Functional Magnetic Resonance Imaging: Overview and methods for psychological research. Behavioral Research Methods, Instruments & Computers, 25(2), 101-113.

Cohen JD & Servan-Schreiber D (1993). A theory of dopamine function and cognitive deficits in schizophrenia. Schizophrenia Bulletin, 19(1), 85-104.

Forman SD, Cohen JD & Johnson MH (1993). Frontal eye fields: Inhibition through competition. Behavioral and Brain Sciences, 6, 578.

Schneider W, Noll DC & Cohen JD (1993). Functional topographic mapping of the cortical ribbon in human vision with conventional MRI scanners. Nature, 365, 150-153.

Cohen JD, Forman SD, Braver TS, Casey BJ, Servan-Schreiber D & Noll DC (1994). Activation of prefrontal cortex in a non-spatial working memory task with functional MRI. Human Brain Mapping, 1, 293-304.

Cohen JD & Huston TA (1994). Progress in the use of parallel distributed processing models for understanding attention and performance. In Umiltà C. and Moscovitch M. (Eds.), Attention and Performance XV: Conscious and Nonconscious Information Processing. Cambridge, MA: MIT Press, pp. 453-476.

Cohen JD, Romero RD, Servan-Schreiber, D & Farah MJ (1994). Mechanisms of spatial attention: The relation of macrostructure to microstructure in parietal neglect. Journal of Cognitive Neuroscience, 6(4), 377-387.

Armony JL, Servan-Schreiber D, Cohen JD & LeDoux JE (1995). An anatomically-constrained neural network model of fear conditioning. Behavioral Neuroscience, 109(2), 246-256.

Carter CS, Mintun M & Cohen JD (1995). Interference and facilitation effects during selective attention: An [^{15}0]-$H_2$0 PET study of Stroop task performance. NeuroImage, 2, 264-272.

Casey BJ, Cohen JD, Jezzard P, Turner R, Noll DC, Trainor R, Giedd J, Pannier L, Kaysen D & Rapoport JL (1995). Activation of prefrontal cortex in children during a non-spatial working memory task with functional MRI. NeuroImage, 2, 221-229.

Forman SD, Cohen JD, Fitzgerald M, Eddy WF, Mintun MA & Noll DC (1995). Improved assessment of significant activation in functional magnetic resonance imaging (fMRI): Use of a cluster-size threshold. Magnetic Resonance in Medicine, 33, 636-647.

Noll DC, Cohen JD, Meyer CH & Schneider W (1995). Spiral k-space MR imaging of cortical activation. Journal of Magnetic Resonance Imaging, 45, 49-56.

Barch D, Cohen JD, Servan-Schreiber D, Steingard S, Steinhauer S & van Kammen D (1996). Semantic priming in schizophrenia: An examination of spreading activation using word pronunciation and multiple SOAs. Journal of Abnormal Psychology, 105, 592-601.

Cohen JD, Braver TS & O'Reilly RC (1996). A computational approach to prefrontal cortex, cognitive control, and schizophrenia: Recent developments and current challenges. Philosophical Transactions of the Royal Society of London Series B (Biological Sciences), 351(1346), 1515-1527.

Servan-Schreiber D, Cohen JD & Steingard S (1996). Schizophrenic deficits in the processing of context: A test of a theoretical model. Archives of General Psychiatry, 53, 1105-1112.

Armony JL, Servan-Schreiber D, Cohen JD & LeDoux JE (1997). Computational modeling of emotion: Explorations through the anatomy and physiology of fear conditioning. Trends in Cognitive Sciences, 1, 28-34.

Armony JL, Servan-Schreiber D, Romanski LM, Cohen JD & LeDoux JE (1997). Stimulus generalization of fear responses: Effects of auditory cortex lesions in a computational model and in rats. Cerebral Cortex, 7, 157-165.

Barch DM, Braver TS, Nystrom LE, Forman SD, Noll DC & Cohen JD (1997). Dissociating working memory from task difficulty in human prefrontal cortex. Neuropsychologia, 35, 1373-1380.

Berns GS, Cohen JD & Mintun MA (1997). Brain regions responsive to novelty in the absence of awareness. Science, 276, 1272-1275.

Braver, TS, Cohen JD, Jonides J, Smith EE & Noll DC (1997). A parametric study of prefrontal cortex involvement in human working memory. NeuroImage, 5(1), 49-62.

Carter CS, Mintun M, Nichols T & Cohen JD (1997). Anterior cingulate gyrus dysfunction and selective attention dysfunction in schizophrenia: An $^{15}OH_20$ PET study during Stroop task performance. American Journal of Psychiatry, 154, 1670-1675.

Casey BJ, Trainor RJ, Orendi JL, Schubert AB, Nystrom, LE, Giedd J, Castellanos X, Haxby J, Noll DC, Cohen JD, Forman SD, Dahl RE & Rapoport JL (1997). A developmental functional MRI study of prefrontal activation during performance of a Go-No-Go task. Journal of Cognitive Neuroscience, 9, 835-847.

Cohen JD, Perlstein WM, Braver TS, Nystrom LE, Noll DC, Jonides J & Smith EE (1997). Temporal dynamics of brain activation during a working memory task. Nature, 386, 604-608.

Genovese CR, Noll DC, Cohen JD & Eddy WF (1997). Estimating test-retest reliability in functional MR imaging I: Statistical methodology. Magnetic Resonance in Medicine, 38, 497-507.

Goddard N, Hood G, Cohen JD, Eddy WF, Genovese CR & Noll DC (1997). Parallel online analysis of functional MRI datasets. Journal of Supercomputing, 11, 295-318.

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Noll DC, Genovese CR, Nystrom L, Vazquez A, Forman SD, Eddy WF & Cohen JD (1997). Estimating test-retest reliability in functional MR imaging II: Application to motor and cognitive activation studies. Magnetic Resonance in Medicine, 38, 508-517.

Botvinick MM & Cohen JD (1998). Rubber hands 'feel' touch that eyes see. Nature, 391, 756.

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Botvinick MM, Nystrom L, Fissell K, Carter CS & Cohen JD (1999). Conflict monitoring vs. selection-for-action in anterior cingulate cortex. Nature, 402(6758), 179-181

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MacDonald AW, Cohen JD, Stenger VA & Carter CS (2000). Dissociating the role of dorsolateral prefrontal cortex and anterior cingulate cortex in cognitive control. Science, 288, 1835-1837.

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Barch DM, Carter CS, Braver TS, Sabb FW, MacDonald A, Noll DC & Cohen JD (2001). Selective deficits in prefrontal cortex function in medication naïve patients with schizophrenia. Archives of General Psychiatry, 58, 280-8.

Botvinick, MM, Braver TS, Carter CS, Barch DM & Cohen JD (2001). Conflict monitoring and cognitive control. Psychological Review, 108(3) 624-652.

Braver TS, Barch DM, Keys BA, Carter CS, Cohen JD, Kaye JA, Janowsky JS, Taylor SF, Yesavage JA, Mumenthaler MS, Jagust WJ & Reed B (2001). Context processing in older

adults: Evidence for a theory relating cognitive control to neurobiology in healthy aging. Journal of Experimental Psychology: General, 130, 746-763.

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Greene JD, Sommerville RB, Nystrom LE, Darley JM & Cohen JD (2001). An fMRI investigation of emotional engagement in moral judgment. Science, 293, 2105-2108.

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Perlstein WM, Dixit NK, Carter CS, Noll DC & Cohen JD (2003). Prefrontal cortex dysfunction mediates deficits in working memory and prepotent responding in schizophrenia. Biological Psychiatry, 53(1), 25-38.

Sanfey AG, Rilling JK, Aronson JA, Nystrom LE & Cohen JD (2003). The neural basis of economic decision-making in the ultimatum game. Science, 300, 1755-1757.

Bogacz R & Cohen JD (2004). Parameterization of connectionist models. Behavioral Research Methods, Instruments & Computers, 36 (4), 732-741.

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Green MF, Nuechterlein KH, Gold JM, Barch DM, Cohen JD, Essock S, Fenton WS, Frese F, Goldberg TE, Heaton RK, Keefe RSE, Kern RS, Kraemer H, Stover E, Weinberger DR, Zalcman S, Marder SR (2004). Approaching a consensus cognitive battery for clinical trials in schizophrenia: The NIMH-MATRICS conference to select cognitive domains and test criteria. Biological Psychiatry, 56(5), 301-7.

Greene JDC & Cohen JD (2004). For the law, neuroscience changes nothing and everything. Philosophical Transactions of the Royal Society of London Series B, 359(1451), 1775-85. Reprinted in Neuroethics: An Introduction with Readings (Basic Bioethics), Farah M (Ed.), Cambridge, MA: MIT Press, 2010; and in Oxford Handbook of Neuroethics, Illes J & Sahakian BJ (Eds.), Oxford: Oxford University Press, 2011.

Greene JDC, Nystrom LE, Engell AD, Darley JM & Cohen JD (2004). The neural bases of cognitive conflict and control in moral judgment. Neuron, 44(2), 389-400.

Holroyd CB, Larsen JT & Cohen JD (2004). Context dependence of the event-related brain potential associated with reward and punishment. Psychophysiology 41(2), 245-53.

Holroyd CB, Yeung N, Nieuwenhuis S, Nystrom LE, Coles MGH & Cohen JD (2004). Dorsal anterior cingulate cortex shows fMRI response to internal and external error signals. Nature Neuroscience, 7(5), 497-498.

Kerns JG, Cohen JD, MacDonald III AW, Cho RY, Stenger VA & Carter CS (2004). Anterior cingulate conflict monitoring and adjustments in control. Science, 303. 1023-1026.

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5. Manuscripts Under Review / In Preparation

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Ozcimder K, Dey B, Musslick S, Patwary MMA, Willke TL & Cohen JD (under review). A graphic-theoretic analysis of parallel processing capability in neural networks.

Petri G, Musslick S, Dey B, Özcimder K, Ahmed NK, Willke TL & Cohen JD (under review). Universal limits to parallel processing capability of network architectures.

Shenhav A, Straccia MA, Cohen JD & Botvinick MM (under review). Dissociable neural mechanisms track evidence accumulation for selection of attention versus action.

White JM, Ericson KMM, Laibson D & Cohen JD (under review). Measuring impatience: What can intertemporal choice experiments tell us?

Wilson RC, Shenhav A, Straccia M & Cohen JD (under review). The eighty-five percent rule for optimal learning. bioRxiv, 1/27/18, doi: http://dx.doi.org/10.1101/255182.

Bornstein AM, Aly M, Feng SF, Turk-Browne NB, Norman KA & Cohen JD (in preparation). Decisions on the basis of continuous accumulation of memory and sensory evidence.

Hoskin AN, Bornstein AM, Norman KA & Cohen JD (in preparation). Refresh my memory: Episodic memory reinstatements intrude on working memory maintenance.

Todd MT, Schwemmer M, Botvinick MM, Cohen JD & Dayan P (in preparation). Task switching and cost minimization.

Wilson RC & Cohen JD (in preparation). Humans tradeoff information seeking and randomness in explore-exploit decisions.

PROFESSIONAL ACTIVITIES

TEACHING:

1. Courses

1989-96 Introduction to Cognitive Psychology (undergraduate survey course)
Department of Psychology, Carnegie Mellon University

1989-96 Cognitive Neuroscience section of Cognitive Core (graduate survey course).
Department of Psychology, Carnegie Mellon University

1990-93 Co-coordinator, Fellowship Training Program in Schizophrenia Research. Western Psychiatric Institute and Clinic, University of Pittsburgh

1992-93 Research Methods in Cognitive Neuroscience (advanced undergraduate seminar).
Department of Psychology, Carnegie Mellon University

1992-93 Functional Neural Circuits (graduate and advanced undergraduate seminar).
Department of Psychology, Carnegie Mellon University

1994-95 Neural and Psychological Mechanisms of Working Memory (graduate and advanced undergraduate seminar). Department of Psychology, Carnegie Mellon University

1996-97 Advanced Topics in Cognitive Neuroscience (graduate and advanced undergraduate seminar). Department of Psychology, Carnegie Mellon University.

1996-97 Biological and Psychological Mechanisms of Attention (graduate and advanced undergraduate seminar). Department of Psychology, Carnegie Mellon University; co-taught with Gary Aston-Jones.

1999-00 Neural Bases of Cognitive Control (undergraduate course). Department of Psychology, Princeton University.

1999-01 Topics in Molecular and Cognitive Neuroscience (graduate seminar). Departments of Psychology and Molecular Biology, Princeton University.

1999-01 Introduction to Neural Networks (undergraduate course). Department of Psychology, Princeton University.

2001-02 Advanced Topics in Neural Network Models of Psychological Function (advanced undergraduate / graduate seminar). Department of Psychology, Princeton University.

2002-03 Statistical Methods in Psychological Research (advanced undergraduate / graduate course). Department of Psychology, Princeton University.

2004-07 Graduate Proseminar in Cognitive Psychology. Department of Psychology, Princeton University.

2009-16 Core Course for Ph.D. Program in Neuroscience, Princeton Neuroscience Institute, Princeton University.

2017 Introduction to Cognitive Psychology (undergraduate survey course, including laboratory component). Department of Psychology, Princeton University

2018 Computational Models of Psychological Function (undergraduate course, including laboratory component). Princeton Neuroscience Institute, Department of Psychology, and Department of Computer Science, Princeton University

2. Tutorials and Workshops

May, 1990-93 — Cohen JD, Servan-Schreiber D. Course co-directors, A primer on neural modeling in psychiatry. 144-7th Annual Meetings of the American Psychiatric Society, New York.

July, 1991 — Invited faculty member. James S. McDonnell Summer Institute in Cognitive Neuroscience, Dartmouth College, Hanover.

October, 1993 — Applications of Functional MRI to Studies of Human Memory. Invited tutorial, Memory Disorders Research Society, Boston.

November, 1993 — Functional neuroimaging. Invited tutorial, Neural Information Processing Society, Boulder.

August, 1996 — Neuroimaging and Behavior. Invited workshop, XXVI International Congress of Psychology, Montreal.

January, 1997 — The Role of Neuromodulation in Cognition: Physiological and Computational Approaches. Panel organizer, 30th Winter Conference on Brain Research, Breckenridge, Colorado.

July, 1997 — Invited faculty member. James S. McDonnell Summer Institute in Cognitive Neuroscience, Dartmouth College, Hanover.

September, 2000 — International Workshop on Neural Bases of Executive Functions and Performance Monitoring, Jena, Germany.

July, 2001 — Invited faculty member. James S. McDonnell Summer Institute in Cognitive Neuroscience, Dartmouth College, Hanover.

3. Trainees

Graduate advisees:

Therese Huston, Ph.D. (1990-1995)
CMU Department of Psychology
Behavioral and computational modeling studies of selective attention
Director, Center for Excellence in Teaching & Learning, University of Seattle

Todd Braver, Ph.D. (1992- 97)
CMU Department of Psychology
Computational and neuroimaging studies of prefrontal cortex and cognitive control
Professor of Psychology, Washington University, St. Louis

Matthew Botvinick, M.D., Ph.D. (1995-2001)
CMU Department of Psychology
Computational modeling and fMRI studies of the role of anterior cingulate cortex in conflict monitoring and control
Professor of Psychology and Neuroscience, Princeton University

Mark Gilzenrat, Ph.D. (1996-2006)
CMU Department of Psychology (1996-1998)
Princeton Department of Psychology (1998-2006)
Computational models and pupillometric studies of neuromodulatory influences on selective attention
Software architect, Navaraga Corporation

Raymond Cho, M.D. (1999-2003)
Department of Psychology, Princeton University

Assistant Professor of Psychiatry, University of Pittsburgh

Eric Shea-Brown, Ph.D. (1999-2004)
Program in Applied and Computational Mathematics, Princeton University
Co-advisor with Philip Holmes
Neural oscillators and integrators in the dynamics of decision tasks
Associate Professor of Applied Mathematics, University of Washington, Seattle

Sean Polyn (2000-2005)
Department of Psychology, Princeton University
Computational modeling of context updating, reinforcement learning and dopamine function
Associate Professor of Psychology and Psychiatry, Vanderbilt University

Aaron Schurger (2001-2008)
Department of Psychology, Princeton University
Electrophysiological and fMRI studies of perceptual awareness
Associate Professor, Inserm-CEA

Agatha Lenartowicz (2002-2008)
Department of Psychology, Princeton University
Behavioral, electrophysiological and fMRI studies of task switching
Postdoctoral Fellow, UCLA

Kimberly D'Ardenne McClure (2005-2008)
Department of Chemistry, Princeton University
fMRI studies of brainstem neuromodulatory nuclei
Postdoctoral Fellow, Montague Lab, Virginia Tech

Susan Robison (2005-2009; co-advised with Ken Norman)
Department of Chemistry, Princeton University
Behavioral and fMRI studies of cognitive control and episodic memory

Emily Chakwin (2006-2008)
Department of Psychology, Princeton University
Behavioral and fMRI studies of moral reasoning

Michael Todd (2006-2012)
Department of Psychology, Princeton University
Computational modeling studies of cognitive control
Data Scientist, Netflix

Adam Moore (2006-2011; co-advised with Andy Conway)
Department of Psychology, Princeton University
Behavioral and fMRI studies of moral reasoning

John White (2008-2013)

Department of Psychology, Princeton University
Behavioral and fMRI studies of economic decision making
Data Scientist, Netflix

Sarah Getz (2008-2013; co-advised with Andy Conway)
Department of Psychology, Princeton University
Behavioral and fMRI studies of economic decision making

Andra Geana (2010-present)
Department of Psychology, Princeton University
Behavioral and fMRI studies of exploration and exploitation in decision making

Jane Keung (2016-present)
Princeton Neuroscience Institute, Princeton University
Behavioral and fMRI studies of prefrontal cortex and cognitive control

Olga Lositsky (2012-present)
Princeton Neuroscience Institute, Princeton University
Behavioral and fMRI studies of decision making

Laura Bustamante (2014-present)
Princeton Neuroscience Institute, Princeton University
Behavioral and fMRI studies of the cost of cognitive control

Sebastian Musslick (2014-present)
Princeton Neuroscience Institute, Princeton University
Behavioral and fMRI studies of cognitive control

Abigail Novick (2014-present)
Department of Psychology, Princeton University
Behavioral and fMRI studies of representational sharing and multitasking

Ph.D. Committees (outside of Neuroscience and Psychology):

Cliona Golden (2004, Ingrid Daubechies), PACM, Princeton University

Adi Livnat (2005, Simon Levin), Ecology and Evolutionary Biology, Princeton University

Ilya Fischoff (2006, Daniel Rubenstein), Ecology and Evolutionary Biology, Princeton University

Juan Gao (2007, Phil Holmes), Program in Applied and Computational Mathematics, Princeton University

Yuan (Sophie) Liu (2007, Phil Holmes), Physics, Princeton University

Caitlin Newberry (2007, Wolf Richter), Chemistry, Princeton University

Phil Eckoff (2008, Phil Holmes), Program in Applied and Computational Mathematics, Princeton University

Andrea Nedic (2011, Phil Holmes), Electrical Engineering, Princeton University

Samuel Feng (Phil Holmes), Program in Applied and Computational Mathematic, Princeton University

Stephanie Goldfarb (2013, Naomi Leonard), Program in Applied and Computational Mathematic, Princeton University

Eran Eldar (2014, Yale Niv), Princeton Neuroscience Institute, Princeton University

Paul Reverdy (2014, Naomi Leonard), Mechanical and Aerospace Engineering, Princeton University

Wouter Kool (Matthew Botvinick), Program in Applied and Computational Mathematic, Princeton University

Postdoctoral trainees:

Steve Forman, M.D., Ph.D. (1992-1994)
University of Pittsburgh Department of Psychiatry
fMRI studies of prefrontal function
Associate Professor of Psychiatry, University of Pittsburgh
Medical Director of the Center for Treatment of Addictive Disorders, Pittsburgh VA

Marius Usher, Ph.D. (1993-1995)
CMU Department of Psychology
Computational models of catecholaminergic neuromodulation and selective attention
Professor of Psychology and Neuroscience, Tel Aviv University

Deanna Barch, Ph.D. (1993-1995)
University of Pittsburgh Department of Psychiatry
Professor of Psychology and Radiology, Washington University, St. Louis

William Perlstein, Ph.D. (1993-1996)
University of Pittsburgh Department of Psychiatry
Electrophysiological and fMRI studies of working memory in schizophrenia
Associate Professor of Clinical and Health Psychology and Psychiatry, University of Florida, Gainsville

Gregory Berns, M.D., Ph.D. (1995-1998)
University of Pittsburgh Department of Psychiatry
Functional neuroimaging studies of novelty detection
Professor of Economics, Emory University

Randy Gobbel, Ph.D. (1997-1998)
Carnegie Mellon University Department of Psychology
Computational modeling studies of basal ganglia function in control of sequential action
Computer Scientist, Artificial Intelligence Center, SRI International

James Kroger (1998-2001)
Princeton University Department of Psychology
FMRI studies of prefrontal cortex organization
Professor of Psychology, New Mexico State University

Nicholas Yeung, Ph.D. (1999-2004)
Princeton University Department of Psychology
Modeling, ERP and fMRI studies of conflict monitoring and cognitive control
University Lecturer in Experimental Psychology, University of Oxford

Gesine Dreisbach, Ph.D. (2000-2001)
Princeton University Department of Psychology
fMRI studies of tasking switching
Professor of Psychology, University of Regensburg

Clay Holroyd, Ph.D. (2001-2004)
Princeton University Department of Psychology
Neural network modeling, ERP, and fMRI studies of performance monitoring and reinforcement learning
Professor of Psychology, University of Victoria

James Rilling, Ph.D. (2001-2003)
Center for the Study of Brain, Mind & Behavior, Princeton University
Neural mechanisms of economic decision making; neural mechanisms in placebo responding.
Associate Professor of Anthropology and Psychiatry and Behavioral Sciences, Emory University

Alan Sanfey, Ph.D. (2001-2003)
Center for the Study of Brain, Mind & Behavior, Princeton University
Neural mechanisms of economic decision making; neural mechanisms in placebo responding.
Associate Professor of Psychology, University of Arizona
Principal Investigator, Donders Institute for Brain, Cognition and Behavior, Radboud University

Rafal Bogacz, Ph.D. (2002-2004)
Princeton University Department of Psychology
Neural network modeling and ERP studies of task switching and performance monitoring.
Associate Professor of Clinical Neuroscience, University of Oxford

Sander Nieuwenhuis, Ph.D. (2002-2003)
Princeton University Department of Psychology
ERP studies and neural network modeling of performance monitoring, task switching and the attentional blink.

Assistant Professor, Cognitive Psychology Unit, Leiden University

Joshua Greene, Ph.D. (2001-2006)
Princeton University Department of Psychology
Neural bases of moral reasoning
Professor of Psychology, Harvard University

Samuel McClure, Ph.D. (2003-2007)
Princeton University Department of Psychology
Neural network modeling and neuroimaging studies of reinforcement learning and decision making
Assistant Professor of Psychology, Stanford University

Jean-Baptiste Pochon, Ph.D. (2003-2005)
Princeton University Department of Psychology
Neuroimaging studies of decision making, conflict monitoring and cognitive control
Postdoctoral Fellow, L'Hôpital de la Salpêtrière in Paris

Patrick Simen, PhD. (2003-present)
Princeton University Program in Applied & Computational Mathematics
Computational modeling, mathematical analysis, behavioral and neuroimaging studies of decision making and cognitive control
Assistant Professor, Oberlin College

Jason Chein, Ph.D. (2004-2005)
Princeton University Department of Psychology
Neuroimaging studies of prefrontal cortex organization and function
Assistant Professor of Psychology, Temple University

Brent Field, Ph.D. (2004-2015)
Center for Study of Brain, Mind and Behavior, and Center for Health and Well-Being, Woodrow Wilson School of Public Policy
Behavioral and neuroimaging studies of attention and emotional regulation among meditation practitioners

Angela Yu, Ph.D. (2004-2008)
Princeton University Department of Psychology
Computational modeling and mathematical analysis studies of decision making and cognitive control
Associate Professor of Cognitive Science, University of California, San Diego

Damon Tomlin, Ph.D. (2006-2013)
Princeton University Department of Psychology and Princeton Neuroscience Institute
Neuroimaging studies of economic and social decision making and cognitive control

KongFatt Wong-Lin, Ph.D. (2006-2009)

Princeton University Department of Mechanical and Aerospace Engineering
Computational modeling and mathematical analysis studies of decision making and cognitive control
Lecturer, Ulster University

Yael Niv, Ph.D. (2007-2008)
Princeton University Department of Psychology
Neuroimaging and computational modeling studies of decision making and cognitive control
Associate Professor of Psychology and Neuroscience, Princeton University

Benjamin Eppinger, Ph.D. (2007-2010)
Princeton University Department of Psychology and Center for Health and Well Being of the Woodrow Wilson School for Public Policy
Neuroimaging studies of age-related differences in economic decision making and cognitive control
Researcher, MPI for Human Development, Berlin

Marieke van Vugt, Ph.D. (2008-2010)
Princeton University Department of Psychology
Neuroimaging and computational modeling studies of decision making and cognitive control
Assistant Professor, University of Groningen

Fuat Balci, Ph.D. (2008-2010)
Princeton University Department of Psychology
Theoretical and behavioral studies of interval timing and decision making
Assistant Professor, Department of Psychology, Koc University, Istanbul

Robert Wilson, Ph.D. (2009-2014)
Princeton University Department of Psychology and Princeton Neuroscience Institute
Theoretical, behavioral and neuroimaging studies of cognitive control & locus coeruleus function
Assistant Professor, University of Arizona

Michael Schwemmer, Ph.D. (2010-2012)
Princeton Neuroscience Institute
Theoretical analyses of capacity constraints on cognitive control
Postdoctoral Fellow, Mathematical Biosciences Institute, Ohio State University

Jarrod Lewis-Peacock, Ph.D. in Psychology, University of Wisconsin-Madison
Princeton Neuroscience Institute (2011-2013; co-advised with Ken Norman)
Neuroimaging studies of cognitive control and prospective memory
Assistant Professor, University of Texas, Austin

Amitai Shenhav, Ph.D. in Psychology, Harvard University
CV Starr Fellow, PNI (2012-present; co-advised with Matt Botvinick)
Theoretical and neuroimaging studies of the costs of cognitive control
Assistant Professor, Brown University

Aaron Bornstein, Ph.D. in Neuroscience, NYU
Princeton Neuroscience Institute (2013-present; co-advised with Ken Norman)
Neuroimaging studies of episodic memory and decision making

Ida Momennajad, Ph.D.
Princeton Neuroscience Institute (2013-present; co-advised with Ken Norman & Nathaniel Daw)
Neuroimaging and theoretical modeling studies of prospective memory

Michael Shvartsman, Ph.D. in Cognitive Science, University of Michigan
Princeton Neuroscience Institute (2014-present)
Theoretical analysis of decision making; Bayesian hierarchical analysis of neuroimaging data

Hasan Kayhan Ozcimder, Ph.D. in Mechanical Engineering
Princeton Neuroscience Institute (2015-2017; co-advised with Naomi Leonard)
Mathematical modeling of capacity constraints in controlled (interactive parallel) processing

Marius Cătălin Iordan, Ph.D. in Computer Science, Stanford University
Princeton Neuroscience Institute (2016-present; co-advised with Daniel Osherson)
Theoretical and neuroimaging studies of semantic representations and cognitive control

Michael Lesnick, Ph.D in Applied Mathematics, Stanford University
Princeton Neuroscience Institute (2016-present)
Tools for topological data analysis (TDA) and their application to neuroscientific data analysis.

Greg Henselman, Ph.D in Applied Mathematics, University of Pennsylvania
Princeton Neuroscience Institute (2017-present)
Tools for topological data analysis (TDA) and their application to neuroscientific data analysis.

RESEARCH and PROFESSIONAL ACTIVITIES:

1. Scientific Interests

Research in my laboratory focuses on the neurobiological mechanisms underlying cognitive control, and their disturbance in psychiatric disorders such as schizophrenia and depression. Cognitive control is the ability to guide attention, thought and action in accord with internally represented goals or intentions. One of the fundamental mysteries of neuroscience is how this capacity for coordinated, purposeful behavior arises from the distributed activity of many billions of neurons in the brain. Several decades of cognitive and neuroscientific research have focused on the mechanisms by which control influences processing (e.g., attentional effects in sensory processing, goal directed sequencing of motor output, etc.), and the brain structures upon

which these functions depend, such as the prefrontal cortex, anterior cingulate cortex, basal ganglia and brainstem neuromodulatory systems. However, we still have a poor understanding of *how* these systems give rise to cognitive control. Our work seeks to develop mechanistically explicit hypotheses about the functioning of these systems, and to test these hypotheses in empirical studies. An important motivation for this work is the development of a theoretically sound foundation for research on the relationship between disturbances of brain function and their manifestation as disorders of thought and behavior in psychiatric illness.

Theoretical work. Neural network models are developed as a way of articulating precise hypotheses about the function of particular brain systems, and their role in cognitive control. This work seeks to bridge between the traditionally disparate levels of analysis of neurophysiology, systems neuroscience, and cognitive psychology. Projects focus on the function of systems considered to be critical for cognitive control, including: a) the role of prefrontal cortex in biasing attention and response selection in posterior structures; b) the role of brainstem dopamine systems in regulating learning and updating of representations in prefrontal cortex; c) the role of the anterior cingulate cortex in monitoring performance, and its influence on adaptations in control; and d) the influence of locus coeruleus and norepinephrine on attentional state and the balance between exploration and exploitation. In many cases, modeling work has led to novel predictions about neurophysiological mechanisms underlying systems-level function, such as: a) gain control as a mechanism for dopaminergic and noradrenergic neuromodulation; b) the role of dopamine in coordinating reinforcement learning and the gating of information into prefrontal cortex; c) the influence of electrotonic coupling on population dynamics within the locus coeruleus; and d) the effects of changes in locus coeruleus physiological state on attentional mode. In other cases, this work has led to novel hypotheses about system level function, such as the response of anterior cingulate cortex to conflict in processing and its influence on adaptive changes in cognitive control, and the role of locus coeruleus in regulating the balance between exploration and exploitation. This work has also predicted, and led to the discovery of new anatomic relationships, such as projections from the anterior cingulate cortex to locus coeruleus. More recent work has examined the relationship between neural network models and simpler, but analytically tractable mathematical models (such as the drift diffusion model) that have been developed for understanding simple forms of decision making at both the neural and behavioral levels, and the role of cognitive control in optimizing these processes to maximize reward rate.

Empirical work. Experimental studies within the laboratory make use of behavioral testing and neuroimaging (using functional magnetic resonance imaging and scalp electrical recordings) in humans. Collaborations with neurophysiologists also involve direct neuronal recordings in non-human species performing cognitive tasks, and detailed anatomic studies. Experiments are designed to test predictions made by neural network models, and to provide data needed to guide their further development. An important motivation for this work is the generation and testing of hypotheses about the neurobiological mechanisms underlying disturbances of behavior in psychiatric disorders. By manipulating variables of biological interest in our models, we are able to explore the effects that disturbances in these variables have on behavior, and then test these in

empirical studies. Empirical findings emerging from this work include: a) the first demonstration in humans of sustained activity in prefrontal cortex associated with working memory performance; b) the correlation of prefrontal cortex activity with parametric manipulations of working memory load; c) the dissociation of frontal responses to working memory load from task difficulty; d) the effects of dopamine manipulation on performance in selective attention and working memory tasks; e) selective deficits both in behavior and prefrontal activity among patients with schizophrenia in these tasks; f) the response of the anterior cingulate cortex to processing conflict in the absence of performance errors; g) the co-localization of event-related potentials associated with errors (ERN) and processing conflict (N_2C); g) behavioral evidence consistent with predictions of reward rate optimization in accumulation-to-bound models of decision making; h) the first behavioral evidence of information seeking ("novelty bonus") in human exploratory behavior; and i) the first demonstration of responses in the human ventral tegmental area to reward prediction errors.

New directions. A focus of increasing interest within the laboratory is the interaction between cognitive control and emotional processing in decision making. This stems from an appreciation of the close interactions between executive (e.g. prefrontal) and evaluative (e.g., anterior cingulate) functions evident in our work on cognitive control, and an equal appreciation of the fact that few, if any, aspects of real world behavior are devoid of such interactions. Studies in the laboratory have explored interactions between cognitive and emotional processes in a variety of behavioral domains, including economic choice (e.g., gambling tasks and intertemporal choice), social interaction (e.g., ultimatum and bargaining games), and moral decision making. Initial findings, using both behavioral and neuroimaging methods, have provided clear evidence for the prevalent engagement of emotional systems in tasks traditionally considered to be predominantly cognitive. This work has set the stage for more detailed studies that examine the interaction between the systems involved in such decision making tasks, with the goal of developing a more accurate understanding of real world behavior. It is also likely to have direct relevance to our understanding of psychiatric disorders, which invariably involve complex interactions between disturbances of thought and feeling.

2. Grants

Scottish Rite Foundation	Context Disturbance in Schizophrenia	PI	1986-88	
NIMH Physician Scientist Award	Context Disturbance in Schizophrenia: Models and Measures	PI	1987-92	MH00673

NIMH P50	Cortical Circuitry and Cognition in Schizophrenia (Edward Stricker, PI) Project 4 (1990-96), Project 7 (1997-02): The Role of Prefrontal Cortex in the Cognitive Dysfunctions of Schizophrenia; Project ?? (2003-07): Neuroendophenotypes and the expression of illness liability in schizophrenia	PI, Project 4,7	1990-07	MH45156
NIMH FIRST Award; RO1	Mechanisms of Context Processing in Schizophrenia	PI	1991-2012	MH47073
NIMH Program Project	Toward Models of Normal and Disordered Cognition (James L. McClelland, PI) Project 2 (1991-96): Neuromodulation and the Processing of Context in Schizophrenia; Project 4 (1997-02): Mechanisms of Cognitive Control	PI, Project 2,4	1991-2002	MH47566
NIMH P50	Center for Functional Brain Imaging (Robert Moore & Mark Mintun, Co-PIs) Cognitive Studies Core	Co-Direct., Cogniti ve Core	1992-97	MH49815
McDonnell Foundation	Neural Bases of Rehearsal and Maintenance in Working Memory	PI	1994-96	JSMF 94-32
NSF CRI	Computational and Statistical Methods for the Analysis of Neuroimaging Datasets	PI	1995-96	IBN9418982
NIMH RO1	fMRI Studies of Prefrontal Cortex	PI	1996-2009	MH52864
NIMH Program Project	Toward Models of Normal and Disordered Cognition (James L. McClelland, PI)	PI, Project 4	1997-02	MH47566
NIDA/HBP RO1	Advanced Methods for Neuroimaging Data Analysis	PI	1997-99	DA11469
NSF ESI	Tracking the Human Brain: An Interactive Planetarium Exposition (Bryan Rogers, PI)	Co-Invest.	1997-99	ESI9705491
NARSAD Independent Investigator Award	An fMRI Study of the Role of Anterior Cingulate in Working Memory Dysfunction in Schizophrenia	PI	1997-99	
NIMH RO1	Neurophysiological and Modeling Studies of Locus Coeruleus (Gary Aston-Jones, Co-PI)	Co-PI	1998-2001	MH33194

NSF MRI	Acquisition of Core Equipment for Princeton Cognitive and Behavioral Neuroscience Initiative (Marcia Johnson and Charles Gross, Co-PIs)	Co-PI	1998-2001	MRI/ OSTI9871186
NJCST	New Jersey Brain Imaging Consortium: Acquisition of high field MRI scanner	PI	1999	
NIMH/HBP RO1	Usability and Interoperability of Neuroimaging Software	PI	2000-03	MH62006
NIMH RO1	Pathophysiology of Cognitive Disability in Schizophrenia (Cameron Carter, PI)	Co-Invest.	2000-04	MH59883
NIMH P50	Conte Center for Neuroscience Research: Cognitive and Neural Mechanisms of Conflict and Control	PI	2000-10	MH62196
Seaver Institute	Neural Economics: Understanding the brain mechanisms underlying cognitive-emotional interactions in decision making	PI	2001-02	
NIDA R21	Hyperscan: Simultaneous fMRI Across the Internet (Emory University; Greg Berns, PI)	Co-Invest.	2001-03	DA014883
MacArthur Foundation	Neural Bases of Placebo Effect and the Expectation of Pain	PI	2001-03	
NIMH P50	IBSC: Toward a Neurobiologically Constrained Framework for Modeling Human Cognition (James L. McClelland, PI). Project 4: Mechanisms of Cognitive Control	PI Project 4	2002-07	MH64445
NIMH RO1	New Wavelet-Based and Source Separation Methods for fMRI (Ingrid Daubechies, PI)	Co-Invest.	2002-07	MH067204
NIMH T32	Training Program in Quantitative Neuroscience	PI	2002-present	MH65214
NJCST	Center for Molecular and Biomolecular Imaging (Warren Warren, PI)	Co-Invest.	2002-09	
DURIP-ONR	Computing Environment for Computational Modeling of Brain Functions	PI	2003	
NSF BCS	Social Cognitive Neuroscience of Category-based Responses (Susan Fiske, PI)	Co-Invest.	2004-05	
NIDA RO1	Neural Mechanisms and Social Influence in Delay Discounting and Impulsive Behavior	PI	2006-11	DA022564
NIDA T90	Training Program in Quantitative and Computational Neuroscience (David Tank, Co-PI)	Co-PI	2006-11	DA022770

MURI	Dynamic Decision Making in Complex Task Environments: Principles and Neural Mechanisms (James L. McClelland, PI)	Co-Invest.	2006-11	AFOSR
MURI	Behavioral Dynamics in the Cooperative Control of Mixed Human/Robotic Teams (John Baillieul, PI)	Co-Invest.	2006-11	AFOSR
DURIP	A Second Generation Flexible Computing Environment for Computational Modeling of Brain Function and Neuroimaging Data Analysis	PI	2008	AFOSR
NCRR	Expansion of a Computing Facility for fMRI and Neuroimaging Analysis	PI	2008	RR023532
NSF MRI	Acquisition of High Performance Compute Cluster for Multivariate Realtime.	PI	2012	BCS1229597
John Templeton Foundation	Toward a Scientific Understanding of the Human Capacity for Cognitive Control	PI	2012-2018	
Intel Corporation	Advanced Methods for Realtime Analysis of Human Brain Imaging Data	PI	2014-2017	

3. Invited Lectureships

American Association for the Advancement of Science (2002)

American Association of Directors of Psychiatry Residency Training (AADPRT), Annual Meeting, Schein Lecture (2012)

American College of Neuropsychopharmacology, Panels (1994, 1995, 1997, 1998, 1999, 2005)

American Economic Association, Symposia (2003, 2005, 2006)

American Psychological Association, Distinguished Scientific Contribution Award Lecture (2010)

American Psychological Society (1994, 1998)

ARVO (2000)

Association for Research in Nervous and Mental Disease, Annual Conference Special Lecture (2006)

Attention and Performance XV, XVIII (1992, 1998)

Baylor College of Medicine, Neuroscience Colloquium (1999); Keynote speaker, Annual Neuroscience Retreat and Rush and Helen Record Forum (2008)

Beckman Institute for Advanced Science and Technology, University of Illinois, Smith, Hinchman & Grills Distinguished Lecture (2003)

Behavioral Neurology Society, Keynote Address (1998)

Biological Psychiatry Society, Presidential Symposium (2002, 2008)

Boston University, Department of Cognitive and Neural Systems Colloquium (2001)

Brandeis University, Department of Biology, Colloquium (1997, 2003)

Brown University, Shlossberg Colloquium (2017)

Cambridge University and the Royal Society, Symposium on Executive and Cognitive Functions of Prefrontal Cortex (1996)
Cardiff University, Cardiff Cognitive Neuroscience Seminar Series (2005)
Carmel Conference XV (1997)
Carnegie Mellon University, Psychology Department Colloquium (1994, 2009)
Cognitive Neuroscience Society (1995, 1996, 2000, 2002, 2006)
Cognitive Neuroscience Treatment Research to Improve Cognition in Schizophrenia Meeting, Invited Talk (2007)
Cold Spring Harbor Laboratory, Computational and Systems Neuroscience Workshop (2004)
College de France, Colloque de Rentrée, Invited Talk (2007)
Columbia Presbyterian Hospital, Joseph Zubin Memorial Fund Award Lecture (1994)
Columbia University, College of Physicians and Surgeons, Department of Psychiatry, Grand Rounds (1990)
Columbia University, College of Physicians and Surgeons, Department of Economics, Cognition and Decision Seminar Series (2016)
Cornell Medical School, Sackler Institute Colloquium (2002)
CUNY, Department of Psychology Colloquium (2000)
DARPA ISAT Toward Optimal Learning Workshop, Invited Address (2014)
Dynamical Systems in Neuroscience, Annual Meeting (1999)
Eden Institute Foundation, Lecture Series Fellow (2001)
Emory School of Medicine, Department of Psychiatry, Grand Rounds (1999)
Ellison Medical Foundation, Workshop of the Biological Assessment of Mental Processes (2006)
Eunice Kennedy Shriver Center for Developmental Cognitive Neuroscience, Colloquium (2000)
FENS and The Brain Prize, Brain Conference on New Insights into Psychiatric Disorders through Computational, Biological and Developmental Approaches, Keynote Address (2016)
Florida State University, Department of Psychology, Colloquium (1998)
Frankfurt Institute for Advanced Studies, Ernst Strüngmann Forum (2007)
Harvard University, Department of Psychology, Colloquium (1996, 2002)
Harvard University, Department of Economics, Labor Economics Seminar (2003)
Human Brain Project, Annual Conference (1998, 1999)
Indiana University, William Lowe Bryan Memorial Lecture on Cognitive Science (1992)
Institute for Advanced Studies, Department of Mathematics, Symposium (2003)
Institute of Psychiatry, King's College, London, Paul Janssen Lecture (2010)
Intel Corporation Annual Developers' Conference, Keynote Address (2016)
Intel Labs Open Innovation Leadership Forum, Invited Address (2105)
Intel Labs, Mini-Symposium: The Mind's Eye Project (2106)
Interface 95 - The 27th Symposium on the Interface: Computing Science and Statistics (1995)
International Conference on Cognitive and Neural Systems, 10th Annual Meeting (2006), Invited Address
International Conference on Cognitive Neuroscience, Keynote Address (1996)
International Congress on Schizophrenia Research (1997), Invited Address
International Meeting on Fully Three-Dimensional Image Reconstruction in Radiology and Nuclear Medicine (1997)

International Neuropsychological Society (1992), Invited Address
James S. McDonnell Summer Institute in Cognitive Neuroscience (1995, 1997, 2001)
Japanese Neuropsychological Association, Keynote Address (1997)
Jena International Workshop on Executive Functions and the Brain (2000)
Kern Medina Seminar on Humanities and Science for State and Federal Judges (2014)
Lehigh University, Annual Neuroscience Retreat, Keynote Address (2015)
Library of Congress / NIMH Annual Decade of the Brain Public Program (1999)
Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Distinguished Guest Lecture Series (2011)
McGill University, Department of Psychiatry, Grand Rounds (1991)
Memory Disorders Research Society (1994, 1997, 1999)
Mind-Life Institute / M.I.T. (2003)
National Foundation for Functional Brain Imaging 1st Annual Meeting (1999)
New York Academy of Medicine, Annual Salmon Lecture (2006)
New York Academy of Sciences, Imaging Discussion Group Meeting (2005)
NIDA, Invited Seminar (2011)
NINDS, Cognitive Neuroscience Section, Grand Rounds (1993)
NIMH, St. Elizabeth's Hospital, Grand Rounds (1997)
NIMH Extramural program, Colloquia and Workshops (1999, 2000, 2001)
NIMH Intramural program, Neuroscience Colloquium (1999)
Nordic Center of Excellence and the Stockholm Brain Institute, Invited Talk (2007)
Northern California Psychiatric Society, Award Address (1986)
Northwestern University, Department of Psychology, Colloquium (1998)
NYU, Departments of Psychology and Neuroscience, Colloquia (1999, 2000)
Ohio State University, Mathematical Biosciences Institute Workshop on Systems Level Modeling (2002)
President's Council on Bioethics (2004)
Princeton Conference on Cerebral Vascular Disease (1994)
Princeton Plasma Physics Laboratory, Colloquium (2004)
Princeton University, Department of Psychology, Colloquium (1996)
Princeton University, Council on Science and Technology Public Lecture Series (2000)
Psychonomic Society, Invited Symposium Lectures (1996, 2002)
Queens College, CUNY, Annual Neuropsychology Symposium, Keynote Address (2007)
Reinforcement Learning and Decision Making, First Annual Meeting, Invited Address (2013)
Research Society on Alcoholism, Plenary Address (2002)
Rockefeller University, Neuroscience Colloquium (1999)
Rotman Research Institute, 10th Annual Conference on the Frontal Lobes (2000)
Royal Society, UK, Mental Processes in the Human Brain (2006)
Rutgers University, Department of Psychology & Center for Molecular and Behavioral Neuroscience Colloquium (1999, 2000)
Rutgers University Brain Health Institute, Invited Colloquium Address (2015)
SISA, Trieste Encounters in Cognition (1992)
Smithsonian Institute Public Lecture Series (1999)

Society for Psychophysiological Research, Invited Address (2006)
Society for Research on Psychopathology (1993)
Stanford University, Neurobiology Department, Frontiers in Neuroscience Lecture Series (2009)
Templeton Foundation, Annual Members Meeting Keynote Address (2016)
TPG Annual Retreat, Featured Speaker (2007)
University of California, Berkeley, Helen Wills Neuroscience Institute Inaugural Lecture (2000)
University of California, Berkeley, Neuroscience Student Seminar Series (2010, 2016)
University of California, Davis, Keynote Address, Opening of Brain Imaging Center (2005)
University of California, Davis, Department of Psychiatry Grand Rounds (2005)
University of California, San Francisco, Department of Psychiatry Grand Rounds (2001)
University College London and Wellcome Functional Imaging Laboratory (1997, 2000)
University of Colorado Boulder, Department of Psychology, Symposium (1997, 2002)
University of Colorado Boulder, Determinants of Executive Function & Dysfunction Conference (2013)
University of Illinois, Program in Neuroscience, Colloquium (1998)
University of Michigan, Departments of Psychology and Psychiatry Colloquia (1994, 2000)
University of Michigan, Marshall Weinberg Cognitive Science Symposium (2013)
University of Maryland, Psychiatric Research Center, 25th Anniversary Symposium (2002)
University of Maryland, Cognitive Science Colloquium (2016)
University of Medicine and Dentistry of New Jersey, Graduate Program in Physiology and Neurobiology, Special Lecture (1999)
University of Medicine and Dentistry of New Jersey, Dept. of Neurology Grand Rounds (2002)
University of North Carolina at Greensboro, Kendon Smith Annual Lecture Series (2004)
University of Oregon, Institute of Cognitive and Decision Sciences, Symposia (1990, 1996)
University of Pennsylvania, Department of Psychology, Cognitive Science Program, and Institute for Neural Sciences Colloquia (1996, 2001)
University of Pennsylvania, Institute of Neurological Sciences, James M. Sprague Annual Lecture (2006)
University of Pennsylvania and Philadelphia Psychoanalytic Center, Evening Program (2006)
University of Rochester, Department of Brain and Cognitive Sciences, Colloquium (2006)
University of Texas Austin, Cognitive Neuroscience & Imaging Research Center Seminar, Invited talk (2016)
University of Texas Southwestern Medical Center, Dept. of Psychiatry, Colloquium (2003)
University of Vermont, Department of Psychiatry, Grand Rounds (1992)
University of Waterloo, Centre for Theoretical Neuroscience, 5th Annual Brain Day (2011)
University of Wisconsin, Department of Psychology, Colloquium (1987, 2002)
University of Wisconsin Medical School, 5th Annual Symposium on Emotion (1999)
Vanderbilt University, Annual Neuroscience Retreat Keynote Address (2001)
Vanderbilt University, Stroopfest (2002)
Washington University, Department of Psychiatry, Grand Rounds (2003)
Winter Conference on Brain Research (1993, 1996, 1997, 1998)
Workshop on Neural Modeling of Brain and Cognitive Disorders (1995, 1998)
Yale University School of Medicine, Department of Neurobiology, Colloquium (2002)

Yale University School of Medicine, Department of Psychiatry, Abraham Ribicoff Annual Lecture (2004)

4. Other research-related activities

Advisory Boards and Councils

Allegheny County Neuropsychiatric Survey, Executive Advisory Board (1996-8)
University of Michigan, Department of Psychology, External Advisory Board (1997)
National Alliance for Research on Schizophrenia and Depression (NARSAD), Scientific Council (1998-present)
NIMH Board of Scientific Counselors, Advisory Panel on Intramural Research Program (1999)
Yale-New Haven VAMC Schizophrenia Research Center, Scientific Advisory Board (1999)
International Organization of Human Brain Mapping, Governing Council (1998-2002), Treasurer (2000-2001), Chair of Neuroinformatics Committee (1998-2001), Chair, Nominations Committee (2001)
National Foundation for Functional Brain Imaging, Advisory Board (1999-2004)
Center for Magnetic Resonance Research, University of Minnesota, Advisory Board (2000)
Harvard Initiative in Systems Neuroscience, Advisory Board (2000)
American Psychiatric Association / NIMH DSM-V Workgroup on Neuroscience (2000-2002)
NIMH Workgroup on Strategic Plan for Mood Disorders (2000-2002).
International Association for the Study of Attention and Performance, Advisory Council (2001-present)
University of Pennsylvania NIMH Silvio O. Conte Center for Neuroscience Research, "The Neurobiology of Stimulus Encoding in Schizophrenia," External Advisory Board (2003, 2008)
Harvard University, Department of Psychology, External Review Committee (2003)
NIMH Measurement and Treatment Development Activities on Cognition in Schizophrenia (MATRICS), Neurocognition Committee (2002-2006)
Council of Princeton University, Executive Committee (2004-5)
National Advisory Mental Health Council (NAMHC) (2004-8)
The Society for Neuroeconomics, Board of Directors (2004-2005)
Gatsby Computational Neuroscience Unit, UCL, Quinquennial Review Panel (2005)
National Advisory Mental Health Council Workgroup on MRI Safety (2005-2007)
Brookhaven National Laboratory, Science and Technology Steering Committee (2005-2014)
Institute for Advanced Studies, Princeton, Decadal Visiting Committee for School of Social Sciences (2007)
National Advisory Mental Health Council Workgroup on Neuroscience Training (2007-2008)
University of Colorado, Boulder NIMH Interdisciplinary Behavioral Science Center, "Executive Function and Dysfunction," External Advisory Board (2009)
Johns Hopkins University, Psychological Brain Sciences Department and Mind Brain Institute External Review Committee (2011)
Princeton University, Research Computing Advisory Council, Member (2011-present)
Harvard University, Mind, Brain and Behavior Initiative, External Review Committee (2013)

Ecole Normale Supérieure, Scientific Advisory Committee of the Département d'Etudes Cognitives (2014-present)
National Academy of Medicine, Forum on Neuroscience (2015-present)

Editorial Boards

American Journal of Psychiatry, Consulting Editor (2001-2006)
Biological Psychiatry, Board of Editors (1999-2009)
Brain Research, Senior Editor for Computational Neuroscience (2005-2010)
Cognitive Neuropsychology, Advisory editor (1997-2002)
Journal of Experimental Psychology: General, Consulting Editor (1996-2005)
Journal of Neurophysiology (2003-2004)
Neuroimage, Board of Editors (2002-2003)
Neuroinformatics, Board of Editors (2002-present)
Neuropsychopharmacology, Board of Editors (1999-2008)
Neuroscience, Board of Editors (1999-2003)
NMR in Biomedicine, Board of Editors (2003-2006)
Proceedings of the Royal Society, Biological Sciences, Board of Editors (2003-2008)
Science, Board of Reviewing Editors (1998-2014)
Trends in Cognitive Science, Advisory Editorial Board (2004-present)
Computational Psychiatry, Editorial Board (forthcoming)

Grant Review

Member, Integrative Cognitive Functional Neuroscience (IFCN-8), NIH Study Section (1998-2003)

Ad hoc reviews for:

Behavioral Science Division, NSF
Clinical Psychopathology Study Section, NIMH
Human Development and Aging Study Section, NIH
Human Frontier Science Program
Medical Research Council (MRC), UK
National Center for Research Resources, NIH
NIMH Intramural Research Program, NIH
Wellcome Trust

Conference Organization

New Directions in Health Care and Education Annual Colloquium. University of Pennsylvania Medical School, May, 1980. Founder and Co-organizer.
25th Annual Carnegie Symposium on Cognition: Scientific Approaches to the Question of Consciousness. Carnegie Mellon University, May, 1993. Co-organizer.

Center for Neuroscience and Mental Disorders bi-annual workshop: Cognitive Neuroscience Approaches to Schizophrenia. University of Pittsburgh, May, 1994. Organizer.

International Congress on Schizophrenia Research. Colorado Springs, April, 1997. Program Consultant.

Society for Research in Psychopathology. Palm Springs, October, 1997. Program Committee.

Neural Processes and Economics Workshop, Woodrow Wilson School, Princeton University. Co-organizer, 2000.

Organization for Human Brain Mapping, New York City, 2003, Chair, Local Organizing Committee.

Computational Cognitive Neuroscience Conference, Co-Founder (with Randall O'Reilly); 2005-2008, Program Committee.

Membership in Professional Organizations

American Association for the Advancement of Science
American Psychological Society
Organization for Human Brain Mapping
Psychonomic Society
Society for Neuroscience

Software Development

PsyScope, Designer and Co-Producer (https://en.wikipedia.org/wiki/PsyScope) — this is a graphical, interactive program for the design and implementation of cognitive experimental tasks on MacIntosh computers. It provides the ability to present stimuli in text, graphic, and acoustic form, and can be used to record manual or voice responses with millisecond accuracy. It incorporates a fully general scripting language, as well as a graphic interface, and is extensible through the use of plug-and-play add-on modules. PsyScope was originally designed for Mac OS prior to and through System 9. It was independently ported to MacOS X, and continues to be supported by the community, freely available, and widely used (with over 3,00 downloads) for experimental research and as a teaching instrument in research centers throughout the world. The design of PsyScope also provided one of the foundations for E-Prime, a PC/Windows-based commercially supported package that was developed in collaboration with Psychology Software Tools (PST) Inc. and is also in widespread use.

Brain Image Analysis Kit, Project Director (BrainIAK.org) — this is a Python-based, open source software package, developed in collaboration with Intel Labs, that supports the application of advanced methods from machine learning and multivariate statistics to the analysis of neuroimaging data. It is tightly integrated with SciKit-Learn (http://scikit-learn.org/), and includes modules for Full Correlation Matrix Analysis (FCMA; Wang et al. 2015), Multi-voxel

Pattern Analysis (MVPA), a suite of methods for Shared Response Modeling (SRM) (including hyper alignment and Inter-Subject Functional Correlation [IFSC]), Topographic Factor Analysis (TFA), and Bayesian-derived methods for Representational Similarity Analysis (RSA). Within the first year and half of its development it has attracted over 9,000 downloads.

PsyNeuLink, Designer, Lead Author (PsyNeuLink.org) — this is a "block modeling environment" designed for use by neuroscientists, psychologists and others interested in building system-level models of the computational mechanisms underlying brain function and its expression in psychological processes and behavior, and in exploring their relationship to developments in research on machine learning and artificial intelligence. It allows components to be constructed that implement various, possibly disparate functions, at potentially different levels of analysis and/or timescale of operation, and integrate these into a coherent modeling environment that can be used to simulate and study their interaction. PsyNeuLink is written in Python, is open source, and meant to be extended. Its goal is to provide an environment for implementing models that are expressed in a concise and easy to read form, that can be executed, shared, compared, and integrated with one another. PsyNeuLink maintains an open, publicly accessible library of its components and models, to which users can contribute, providing a common repository for model-sharing in a manner paralleling data-sharing efforts in empirical research.