

David Badre, Ph.D.

David_Badre@brown.edu

Box 1978
Brown University
Providence, RI 02912

tel 401-863-9563
fax 401-863-2255

Academic Positions

- 2008 – present **Brown University** Providence, RI
Department of Cognitive and Linguistic Sciences
Department of Psychology
Assistant Professor
- 2005 – 2007 **University of California, Berkeley** Berkeley, CA
Helen Wills Neuroscience Institute
Postdoctoral Fellow
- 2004 – 2005 **Stanford University** Stanford, CA
Department of Psychology
Visiting Scholar
- 2000 – 2005 **Massachusetts Institute of Technology** Cambridge, MA
Department of Brain and Cognitive Sciences
Ph.D. in Cognitive Neuroscience with minor in Computational
Neuroscience (June 2005)
Dissertation: Controlling memory and resolving interference: Prefrontal
contributions to flexible behavior. Advisor: Anthony D. Wagner
- 1996 – 2000 **University of Michigan** Ann Arbor, MI
BS, Biopsychology and Cognitive Science, High Distinction
and Highest Honors (May 2000)
Honors Thesis: Behavioral and neuroimaging evidence of dissociable
switching mechanisms in executive function. Advisor: John Jonides

Awards

- 2008 Elected to the Memory Disorders Research Society
- 2005-2007 National Research Service Award, National Institute of Neurological
Disorders and Stroke, NIH
- 2004 Walle Nauta Award for Excellence in Graduate Teaching
- 2003-2005 NIH Institutional Predoctoral Fellowship in Visual Cognition
- 2002 McDonnell Summer Institute in Cognitive Neuroscience Fellowship
- 2001 Glenn Foundation/AFAR Scholarship for Research in the Biology of
Aging
- 2000-2003 National Defense Science and Engineering Fellowship
- 2000 Recipient of National Science Foundation Graduate Fellowship (Awarded,
but did not accept in lieu of former)
- 2000 Tanner Memorial Award for Meritorious Undergraduate Research in
Psychology
- 1999 UROP Biomedical Summer Fellowship

Memberships

2008 – present Memory Disorders Research Society
2001 – present Society for Neuroscience
1999 – present Cognitive Neuroscience Society

Teaching

Brown University, Department of Cognitive & Linguistic Sciences and Psychology

PSYC 1870 - Functional Magnetic Resonance Imaging: Theory and Practice

COGS 0720 - Mind & Brain: Introduction to Cognitive Neuroscience

COGS 1860 – Cognitive Control Functions of the Prefrontal Cortex

Professional

Editorial Board:

Ad Hoc Referee:

Grants: *Cognitive Neuroscience*
Cognitive Neuroscience, NSF
Perception, Action, and Cognitive Sciences, NSF
Neurosciences and Mental Health Board, MRC (UK)

Journals: *Biology Letters (formerly section of Proc. R. Soc. B)*
Brain and Language
Cerebral Cortex
Cognition
Cognitive, Affective, and Behavioral Neuroscience
Cognitive Neuropsychology
Cognitive Neuroscience
Cognitive Psychology
Experimental Brain Research
European Journal of Neuroscience
Human Brain Mapping
Journal of Cognitive Neuroscience
Journal of the International Neuropsychological Society
Journal of Neurophysiology
Journal of Neuropsychology
Journal of Neuroscience
NeuroImage
Neuron
Neuropsychologia
Neuroscience
Neuroscience Letters
Neuroscience & Biobehavioral Reviews
PLoS ONE
Proceedings of the National Academy of Sciences, USA
Psychological Science
Psychological Bulletin
Psychonomic Bulletin & Review
Social Cognitive and Affective Neuroscience
Science
Topics in Cognitive Science
Trends in Neurosciences

Session Chairperson:

“Hierarchical models of cognitive control and frontal lobe function”
Symposium at the Memory Disorders Research Society, 2008
Annual Meeting of the Society for Neuroscience, 2007

Lectures and Colloquia

May 2010 (*planned*)

“Prefrontal cortex and hierarchical control of behavior” Cognitive Neuroscience Lecture Series, NIH, Bethesda, MD

December 2009

“Ventrolateral prefrontal cortex contributions to the cognitive control of memory.” Keynote lecture, Annual meeting of the Charles River Association for Memory.

March 2009

“Prefrontal cortex and learning of abstract action rules” GPP-NIH retreat. Woods Hole, MA

February 2009

“Prefrontal cortex and hierarchical control of behavior” Cognitive Brown Bag Series, Harvard University

February 2009

“Prefrontal cortex and hierarchical control of behavior” Brain and Language Series, University of Pennsylvania

January 2009

“Prefrontal cortex and hierarchical control of behavior” Cognition & Perception seminar series, New York University

January 2009

“Prefrontal cortex and hierarchical control of behavior” Invited talk. Ecole Normale Superieur, Paris, France

October 2008

“Cognitive control and the functional organization of lateral frontal cortex.” Brown Institute for Brain Sciences Lunch.

December 2007

“Cognitive control, hierarchy, and the rostro-caudal axis of the prefrontal cortex.” Invited speaker at “Hierarchical organization of behavior: Computational, psychological, and neural perspectives” a Neural Information Processing Systems satellite workshop, Vancouver, Canada

April, 2007

“Cognitive control of memory and action: Contributions of the prefrontal cortex.” Special symposium, McGovern Institute, MIT

February, 2007

“Cognitive control of memory and action: Contributions of the prefrontal cortex” Invited talk, Brown University

February, 2007

“Cognitive control of memory and action: Contributions of the prefrontal cortex” Invited talk, Duke University

January, 2007

“Cognitive control of memory and action: Contributions of the prefrontal cortex” Invited talk, Columbia University

November, 2006

“Placing behavior in context: Cognitive control of memory and action” Cognition, Brain, and Behavior Colloquium, UC Berkeley

Mentoring

Postdoctoral Fellows

Ilke Öztekin, PhD (2008-)

Graduate Students

Jennifer Barredo (2009-)

Research Assistants

Nicole Long (2008-)

Honors Thesis Advisees

Priscilla Mok (2008-09)

Graduated with honors

Karina Sakanaka (2007-08)

Graduated with honors

Fenna Krienen (2005-07)

Graduate student (Harvard)

Undergraduate RAs

Matthew Scult (2008-)
David Pagliaccio (2008-)
Monica Rosenberg (2008-)
Matthew Paquette (2005-06)
Taylor Berg-Kirkpatrick (2006-07)

Latest Achievements

Summer UTRA award
Summer UTRA award
Research Assistant (UCSF)
Graduate Student (Berkeley)

UROP Undergraduates

Sarah Laszlo (2002-03)
Ivana Sturdivant (2002-03)

Latest Achievements

Graduate Student, U. of Illinois
Medical Student, UNC

Pierce College Internship Program

Nahrin Ebrahimi (Summer 2006)

Minority Access to Research Careers (MARC) Program

Jacinta Tibbs (Summer 2002)

Prelim and Thesis Committees

Sophie Lebrecht, Bradley Doll, Adam Darlow, Jennifer Barredo, Heida Sigurdardottir, Arjun Bansal, Adrian Nestor, and Giulia Righi.

University Service

2009-present CLS Colloquium committee (chair)
2009-present NSGP Seminar Series committee
2008-present CLiPS Website & Publicity Committee
2008-2009 Memory and Attention Faculty Search Committee
2008-2009 Neuroscience Graduate Admissions Committee
2008 Psychology Department Honors Awards Committee
2008 Whalen Award Committee
2008 Neuroscience Postdoctoral Training Grant Nomination Committee

Current Research Support

David Badre, P.I.
Cognitive control and the functional organization of frontal cortex
National Institute of Neurological Disorders and Stroke (NINDS), National Institutes of Health
2/15/2010 – 1/31/2015 (R01 NS065046)
\$1,728,019 (Direct: \$1,093,750)

Pending Research Support

David Badre, P.I.
Neural basis of the cognitive control of memory
National Institutes of Health (R01 MH090133)

Publications

Long, N. M., Öztekin, I., and Badre, D. Separable prefrontal contributions to free recall. Under Review.

Badre, D., Kayser, A. S., D'Esposito, M. Frontal cortex and the discovery of abstract action rules. *Neuron*. In Press

Badre, D. Is prefrontal cortex necessary for the storage and acquisition of relational concepts? *Cognitive Neuroscience*. In Press.

Race, L. Badre, D., and Wagner, A. D. Multiple forms of learning yield temporally distinct electrophysiological repetition effects. *Cerebral Cortex*. In Press.

Öztekin, I., Long, N. M., and Badre, D. Optimizing design efficiency of free recall events for fMRI. *Journal of Cognitive Neuroscience*. In Press.

Badre, D. and D'Esposito, M. Is the rostro-caudal axis of the frontal lobe hierarchical? (2009). *Nature Reviews Neuroscience*, 10, 659-669.

Badre, D., Hoffman, J., Cooney, J.W., and D'Esposito, M. (2009). Hierarchical cognitive control deficits following damage to the human frontal lobe. *Nature Neuroscience*, 12(4), 515-522.

Race, E.A., Kuhl, B.A., Badre, D., and Wagner, A.D. (2009). Cognitive control and memory: Contributions from prefrontal cortex. In M. S. Gazzaniga, *The Cognitive Neurosciences (4th Edition)*. Cambridge, MA: MIT Press.

Badre, D. (2008). Cognitive control, hierarchy, and the rostro-caudal axis of the prefrontal cortex. *Trends in Cognitive Science*, 12(5), 193-200.

Lebrecht, S. and Badre, D. (2008). Emotional regulation, or: How I learned to stop worrying and love the nucleus accumbens. *Neuron*, 59, 841-843.

Badre, D. and D'Esposito, M. (2007). FMRI evidence for a hierarchical organization of the prefrontal cortex. *Journal of Cognitive Neuroscience*, 19(12), 2082-2099.

Badre D., and Wagner, A. D. (2007). Left ventrolateral prefrontal cortex contributions to the control of memory. *Neuropsychologia*. 45, 2883-2901.

Badre D. (2007). Ventrolateral prefrontal cortex and controlling memory to inform action. In (S. A. Bunge and J. D. Wallis, Eds), *Neuroscience of Rule-Guided Behavior*. New York: Oxford University Press. 365-389.

Badre, D. and Wagner, A. D. (2006). Cognitive and neurobiological mechanisms underlying cognitive flexibility. *Proceedings of the National Academy of Sciences, USA*, 103(18), 7186-7191.

Badre, D., Poldrack, R. A., Paré-Blagoev, E. J., Insler, R., and Wagner, A. D. (2005). Dissociable controlled retrieval and generalized selection mechanisms in ventrolateral prefrontal cortex. *Neuron*, 47, 907-918.

Badre, D. and Wagner, A. D. (2005). Frontal lobe mechanisms that resolve proactive interference. *Cerebral Cortex*, 15(12), 2003-2012.

Bunge, S. A., Wendelken, C., Badre, D., and Wagner, A. D. (2005). Analogical reasoning and prefrontal cortex: Evidence for separable retrieval and integration mechanisms. *Cerebral Cortex*, 15(3), 239-249.

Badre, D., and Wagner, A. D. (2004). Selection, integration, and conflict monitoring: Assessing the nature and generality of prefrontal cognitive control mechanisms. *Neuron*, 41, 473-487.

Wagner, A. D., Bunge, S. A., and Badre, D. (2004). Cognitive control, semantic memory, and priming: Contributions from prefrontal cortex. In M. S. Gazzaniga (Ed.), *The New Cognitive Neurosciences (3rd Edition)*. Cambridge, MA: MIT Press.

Gehring, W.J., Bryck, R.L., Jonides, J., Albin, R.L., and Badre, D. (2003). The mind's eye, looking inward? In search of executive control in internal attention shifting. *Psychophysiology*, 40(4), 572-585.

Badre, D. and Wagner, A. D. (2002). Semantic retrieval, mnemonic control, and prefrontal cortex. *Behavioral and Cognitive Neuroscience Reviews*, 1(3), 206-218.

Hernandez, L., Badre, D., Noll, D. C., and Jonides, J. (2002). Temporal sensitivity of event related fMRI. *Neuroimage*, 17(2), 1018-1026.

Jonides, J. Badre, D., Curtis, C., Thompson-Schill, S. L., and Smith, E. E. (2002). Mechanisms of conflict resolution in prefrontal cortex. In D. T. Stuss and R.T Knight (eds), *Principles of Frontal Lobe Function*. New York: Oxford Univ Press, 233-245.

Jonides, J., Wager, T. D., and Badre, D. (2002). Neuroimaging of memory. In V. S. Ramachandran (Ed.), *The Encyclopedia of the Human Brain*. San Diego: Academic Press.

Proceedings

Pagliaccio, D., Lebrecht, S., and Badre, D. (*planned* April 2010). Distributed patterns of activation in the prefrontal cortex reflect task-relevant visual dimensions of a stimulus. Poster to be presented at the 17th Cognitive Neuroscience Society meeting.

Öztekin, I. and Badre, D. (*planned* April 2010). Changes in distributed patterns of activation associated with proactive interference resolution in working memory. Talk to be presented at the 17th Cognitive Neuroscience Society meeting.

Long, N. M., Doll, B. D., Badre, D., and Frank, M. J. (*planned* April 2010). The neural mechanisms of exploratory and exploitive behavior. Poster to be presented at the 17th Cognitive Neuroscience Society meeting.

Lebrecht, S., Long, N. M., and Badre, D. (October 2009). Ventrolateral prefrontal cortex contributions to rule-guided memory retrieval. Abstract accepted for the 39th meeting of the Society for Neuroscience.

Öztekin, I., and Badre, D. (October 2009). Distinct contributions of the medial temporal lobe and the left ventrolateral prefrontal cortex to memory retrieval. Abstract accepted for the 39th meeting of the Society for Neuroscience.

Frank, M. J., and Badre, D. (October 2009). Hierarchical reinforcement learning in prefrontal-basal ganglia circuits: neurocomputational and imaging studies. Abstract accepted for the 39th meeting of the Society for Neuroscience.

Long, N. M., Öztekin, I., and Badre, D. (October 2009). An fMRI study of the neural mechanisms supporting free recall. Abstract accepted for the 39th meeting of the Society for Neuroscience.

Öztekin, I., Long, N. M., and Badre, D. (March 2009). Distinguishing events during free recall with fMRI. Poster presented at the 16th Cognitive Neuroscience Society meeting.

Long, N. M., and Badre, D. (March 2009). Testing hierarchical interactions in frontal cortex during cognitive control. Poster presented at the 16th Cognitive Neuroscience Society meeting.

Brozinsky, C., Badre, D., and D'Esposito, M. (March, 2009). The effects of medial temporal lobe damage on proactive interference. Poster presented at the 16th Cognitive Neuroscience Society meeting.

Barredo, J. L., Badre, D., and Burwell, R. D. (November, 2008). A novel task-shifting paradigm for rats to be used for the comparative analysis of executive function in rodents and humans. Poster presented at the 38th meeting of the Society for Neuroscience.

Kayser, A. S., Badre, D., Sakanaka, K., Erickson, D., and D'Esposito, M. (November, 2008). The rostro-caudal axis of the frontal lobe and learning of hierarchical rules. Talk presented at the 38th meeting of the Society for Neuroscience.

Badre, D. (September 2008). Building and breaking hierarchical control: Studies of learning and dysfunction along the rostro-caudal axis of the frontal lobes. Talk at the Memory Disorders Research Society meeting.

Koralek, A., Badre, D., D'Esposito, M. (April, 2008). Benefiting from hierarchy: Interactions between levels of control in the prefrontal cortex. Poster presented at the 15th Cognitive Neuroscience Society meeting.

Badre, D., Krienen, F., and D'Esposito, M. (Nov, 2007). Cognitive control in frontal polar cortex: Abstractness versus the temporal organization of behavior. Talk presented at the 37th meeting of the Society for Neuroscience.

Koralek, A., Badre, D., Miller, B. T., Konkell, A., Cohen, N. J., and D'Esposito, M. (Nov, 2007). Prefrontal and Hippocampal contributions to relational versus item memory: Short-term and long-term effects. Poster presented at the 37th meeting of the Society for Neuroscience.

Bressler, D., Badre, D. and D'Esposito, M. (Nov, 2007). A new technique for analyzing the informational content of activity patterns in the brain. Poster presented at the 37th meeting of the Society for Neuroscience.

Badre, D., and D'Esposito, M. (May, 2007). Temporal dynamics and representational selection in frontal polar cortex. Poster presented at the 14th Cognitive Neuroscience Society meeting.

Hoffman, J., Badre, D., Berg-Kirkpatrick, T., Krienen, F., Cooney, J.W., and D'Esposito, M. (May, 2007). Dissociating levels of cognitive control in frontal cortex hierarchy: Evidence from patients with focal lesions. Poster presented at the 14th Cognitive Neuroscience Society meeting.

Krienen, F., Badre, D., and D'Esposito, M. (May, 2007). Hold your horses! Testing the race model of response inhibition. Poster presented at the 14th Cognitive Neuroscience Society meeting.

Miller, B.T., Badre, D., Konkell, A., Cohen, N. J., and D'Esposito, M. (May, 2007). Prefrontal and hippocampal contributions to the active maintenance of item and relational representations in working memory. Poster presented at the 14th Cognitive Neuroscience Society meeting.

Badre, D., and D'Esposito, M. (October 16, 2006). fMRI evidence for a hierarchical organization of control in prefrontal cortex. Talk presented at the 36th meeting of the Society for Neuroscience.

Race, E., Badre, D., Jones, C., and Wagner, A. D. (October 16, 2006). Electrophysiological correlates of stimulus-response learning: Effects of response repetition and response conflict. Poster presented at the 36th meeting of the Society for Neuroscience.

Badre, D. (August 26, 2006). fMRI evidence for a hierarchical organization of control in prefrontal cortex. Talk presented at the third annual Bay Area Memory Meeting.

Krienen, F., Badre, D., and D'Esposito, M. (August 26, 2006). Hold your horses! Manual stopping does not predict verbal stopping. Talk presented at the third annual Bay Area Memory Meeting.

Race, E. A., Badre, D., Jones, C., Bruich, S., Wagner, A. D. (April 9, 2005). Event-related potentials associated with perceptual, conceptual, and response priming. Poster presented at the 13th annual meeting of the Cognitive Neuroscience Society.

Badre, D. and Wagner, AD. (November 12, 2005). Computational modeling and fMRI support for interference in task switching. Talk presented at the 35th meeting of the Society for Neuroscience.

Badre, D. (August 27, 2005). Computational modeling and fMRI support for interference in task switching. Talk presented at the second annual Bay Area Memory Meeting.

Badre, D. (August 21, 2004). Frontal lobe mechanisms that resolve proactive interference. Talk presented at the first annual Bay Area Memory Meeting.

Sala, J. B., Badre, D., and Wagner, A. D. (August 21, 2004). Investigating effective connectivity of prefrontal cortex and cognitive control using dynamic causal modeling. Poster presented at the first annual Bay Area Memory Meeting.

Badre, D., and Wagner, A. D. (November 11, 2003). Prefrontal mechanisms in task switching: Distinguishing interference and task-set retrieval. Talk presented at the 33rd meeting of the Society for Neuroscience.

Insler, R. Z., Badre, D., Wagner, A. D. (November 9, 2003). Retrieving and selecting semantic knowledge: evidence for a common left prefrontal control mechanism. Poster presented at the 33rd meeting of the Society for Neuroscience.

Wraga, M., Shephard, J., Badre, D., Church, J., and Kosslyn, S. M. (March 31, 2003). An fMRI study of individual differences in visuo-spatial imagery. Poster presented at the 10th annual meeting of the Cognitive Neuroscience Society.

Badre, D. and Wagner, A. D. (March 30, 2003). Prefrontal cortex and domain-dependent resolution of proactive interference in working memory. Poster presented at the 10th annual meeting of the Cognitive Neuroscience Society.

Jonides, J., Sylvester, C. C., Christensen, J. C., Thomas, A. A., Wager, T. D., Kroger, J. K., Salthouse, T. A., Badre, D., and Smith, E. E. (November 4, 2002). Brain activations in the trail making test measured by fMRI. Talk presented at the 32nd meeting of the Society for Neuroscience.

Wagner, A.D. and Badre D. (November 4, 2002). Age-related decline in the control of memory: Evidence for dysfunctional medial temporal and frontal lobe interactions. Talk presented at the 32nd meeting of the Society for Neuroscience.

Badre, D. and Wagner A. D. (November 4, 2002). Selection within working memory and resolution of expectancy violations: Contributions from prefrontal cortex. Poster presented at the 32nd meeting of the Society for Neuroscience.

Wraga, M., Church, J., and Badre D. (April 16, 2002). Event-related fMRI study of imaginal self and object rotations. Poster presented at the Cognitive Neuroscience Society Annual Meeting.

Badre, D., and Wagner, A. D. (April 14, 2002). Prefrontal and medial temporal contributions to controlled semantic retrieval in cognitive aging. Poster presented at the Cognitive Neuroscience Society Annual Meeting.

Badre, D., and Wagner, A. D. (April 11, 2002). Prefrontal and medial temporal contributions to controlled semantic retrieval in cognitive aging. Poster presented at Fifteenth Annual American Federation for Aging Research Grantee Conference.

O’Kane, G. C., Badre*, D, Paré-Blagoev, R. A., Poldrack, R. A., and Wagner, A. D. (November 11, 2001). Left prefrontal processes subserving mnemonic control during semantic retrieval. Talk presented at the 31st annual meeting of the Society for Neuroscience. * Presenting author.

Wagner, A. D., Paré-Blagoev, J., Badre*, D., Clark, J., and Poldrack, R. A. (March 25, 2001). Functional contributions of left inferior prefrontal cortex: fMRI support for the controlled semantic retrieval hypothesis. Poster presented at the Cognitive Neuroscience Society Annual Meeting. * Presenting author

Badre, D. Jonides, J., Hernandez, L., Noll, D. C., Smith, E. E., Chenevert, T. L. (April 11, 2000). Behavioral and neuroimaging evidence of dissociable switching mechanisms in executive functioning. Poster presented at the Cognitive Neuroscience Society Annual Meeting.