

Matthew C. Davidson
Curriculum Vitae

Current Position:

Lecturer
Department of Psychological and Brain Sciences
University of Massachusetts
Amherst, MA, 01003
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Education and Training:

2005-2012 Assistant Professor, Psychological and Brain Sciences, University of Massachusetts
2001-2005 Instructor of Psychology in Psychiatry at the Sackler Institute for Developmental Psychobiology within Cornell University Medical College
1998-2001 Post-doctoral Fellow at the Center for Developmental Cognitive Neuroscience within the Kennedy Shriver Center of UMass Medical School
1991-1998 Doctoral Student at the University of Oregon
1987-1991 Undergraduate Student at the University of Lethbridge

Research Support:

The Effects of Physical Activity on Cognitive Abilities across Development.
Healey Endowment/Faculty Research Grant (Principal Investigator – \$30,000) 2007-2008
Interactions between Estrogens and Physical Activity on Emotional Self-Regulation Abilities
Office of Research Development (Principal Investigator – \$15,000) 2008-2009
Localizing the Control of Visual Attention Focus
Office of Research Development (Co-Investigator – \$15,000) 2009-2010
Interdisciplinary MRI User Group
Mellon Mutual Mentoring Grant (Co-Investigator – \$10,000) 2009-2010
Attentional Zoom and the Left Temporo-Parietal Junction
Office of Research Development (Co-Investigator – \$15,000) 2010-2011
Physical Activity and Cognitive Development: Interactions with Hormones and Genetic Factors
NSF (Principal Investigator) Not funded
Physical Activity and Adolescent Brain Development: Impacts of an Exercise Intervention
NIH – RC1 (Principal Investigator) Not funded
Physical Activity and Cognitive Development: Interactions with Hormones and Genetic Factors
NIH – R21 (Principal Investigator) Not funded
Endocrine contributions to emotional aging in male primates
NIH-R21 (Co-Investigator) Not funded
Brains and Games: Interactive Exer-learning Technologies to Teach Science and Math
NIH – RC1 (Co-Investigator) Not funded

Publications:

- Ready RE, **Davidson MC**, Niznikiewicz M (2011). Age, emotion, and cognitive load: Age-related differences in attention to emotional faces. In Freitas-Magalhaes (Ed.) Emotional Expression: The Brain and the Face.
- Shing YL, Lindenberger U, Diamond A, Li SC, **Davidson MC** (2010). Memory maintenance and inhibitory control differentiate from early childhood to adolescence. Developmental Neuropsychology, 35(6), 679-697.
- Tottenham N, Hare TA, Quinn, BT, McQuarry TW, Nurse M, Gilhooly T, Milner A, Galvan A, **Davidson MC**, Eigsti IM, Thomas KM, Freed PJ, Booma ES, Gunnar MR, Altemus M, Aronson J, Casey BJ (2010). Prolonged institutional rearing is associated with atypically large amygdala volume and difficulties in emotion regulation. Developmental Science, 13(1), 46-61.
- Mulder MJ, Baeyens D, **Davidson MC**, Casey BJ, van den Ban E, van Engeland H, Durston S (2008). Familial vulnerability for ADHD affects activity in cerebellum in addition to prefrontal systems. Journal of the American Academy of Child and Adolescent Psychiatry, 47(1): 68-75.
- Garrett A, Penniman L, Epstein JN, Casey BJ, Hinshaw SP, Glover G, Tonev S, Vitolo A, **Davidson MC**, Spicer J, Greenhill LL, Reiss AL (2008). Neuroanatomical abnormalities in adolescents with attention-deficit/hyperactivity disorder. Journal of the American Academy of Child and Adolescent Psychiatry, 47(11):1321-8.
- Durston, S. **Davidson MC**, Mulder, MJ, Spicer JA, Galvan A, Tottenham N, Scheres A, Castellanos XF, van Engeland H, Casey BJ (2007). Neural and behavioral correlates of expectancy violations in attention-deficit hyperactivity disorder. Journal of Child Psychology & Psychiatry, 48(9): 881-889.
- Epstein JN, Casey BJ, Tonev ST, **Davidson MC**, Reiss AL, Garrett A, et al (2007). Assessment and prevention of head motion during imaging of patients with attention deficit hyperactivity disorder. Psychiatry Research 155(1): 75-82.
- Epstein JN, Casey BJ, Tonev ST, **Davidson MC**, Reiss AL, Garrett A, et al (2007). ADHD and medication-related brain activation effects in concordantly affects parent-child dyads with ADHD. Journal of Child Psychology & Psychiatry, 48(9): 899-913.
- Casey BJ, Epstein JN, Buhle J, Liston C, **Davidson MC**, Tonev ST, et al (2007). Frontostriatal connectivity and its role in cognitive control in parent-child dyads with ADHD. American Journal of Psychiatry, 164(11): 1729-1736.
- Davidson MC**, Amso D, Anderson LC, Diamond A (2006). Development of cognitive control and executive functions from 4 to 13 years: Evidence from manipulations of memory, inhibition, and task switching. Neuropsychologia, 44(11): 2037-78.
- Durston S, **Davidson MC**, Tottenham N, Galvan A, Spicer J, Fossella JA, Casey BJ (2006). A shift from diffuse to focal cortical activity with development. Developmental Science, 9(1): 1-8.
- Casey BJ, Amso D, **Davidson MC** (2006). Learning about learning and development with modern imaging techniques. In Attention and Performance XXI: Processes of Change in Brain and Cognitive Development (Y Munakata & MH Johnson, eds.) pp 513-534. Oxford University Press, Oxford U.K.
- Liston C, Matalon S, Hare TA, **Davidson MC**, Casey BJ (2006). Anterior cingulate and posterior parietal cortices are sensitive to dissociable forms of conflict in a task-switching paradigm. Neuron, 50(4): 643-653.
- Liston C, Watts R, Tottenham N, **Davidson MC**, Niogi S, Ulug AM, Casey BJ (2006). Frontostriatal microstructure predicts individual differences in cognitive control. Cerebral Cortex, 16: 553-560.

- Scerif G, Worden MS, **Davidson MC**, Seiger L, Casey BJ (2006). Context modulates early stimulus processing when resolving stimulus-response conflict. Journal of Cognitive Neuroscience 18(5): 781-792.
- Eigste IM, Zayas V, Michel W, Shoda Y, Ayduk O, Badlani MB, **Davidson MC**, Lawrence AJ, Casey BJ (2006). Predicting cognitive control from preschool to late adolescence and young adulthood. Psychological Science, 17(6): 478-84.
- Amso D, **Davidson MC**, Johnson S, Casey BJ (2005). Contributions of the hippocampus and the striatum in simple association and frequency-based learning. Neuroimage, 27(2): 291-298.
- Durston S, **Davidson MC**, Tottenham N, Galvan A, Spicer J, Fossella JA, Casey BJ, (2005). A shift from diffuse to focal cortical activity with development. Developmental Science, 9(1): 1-8.
- Galvan A, Hare TA, **Davidson MC**, Spicer J, Glover GH, Casey BJ (2005). Behavioral and neural responses to differences in reward magnitude. Journal of Neuroscience, 25(38): 8650-8656.
- Hare T, Tottenham, N, **Davidson MC**, Glover GH, Casey BJ (2005). Contributions of amygdala and striatal activity in emotion regulation. Biological Psychiatry, 57(6): 624-632.
- Zhaung L, Thomas KM, **Davidson MC**, Casey BJ, Heier LA, Ulug AM (2005). MR quantification of volume and diffusion changes in the developing brain. American Journal of Neuroradiology, 26: 45-49.
- Davidson MC**, Horvitz JC, Tottenham N, Fossella JA, Watts R, Ulug AM, Casey BJ, (2004). Differential cingulate and caudate activation following unexpected non-rewarding stimuli. Neuroimage, 23: 1039-1045.
- Casey BJ, **Davidson MC**, Hara Y, Thomas KM, Martinez A, Galvan A, Halperin JM, Rodriguez-Aranda CE, Tottenham N, (2004). Role of the caudate nucleus in development of attention switching. Developmental Science, 7(5): 534-542.
- Davidson MC**, Thomas KM, Casey BJ, (2003). Imaging the developing brain with fMRI. Mental Retardation and Developmental Disabilities, 9(3): 161-167.
- Durston S, **Davidson MC**, Thomas KM, Worden M, Tottenham N, Martinez A, Watts R, Ulug AM, Casey BJ, (2003). Parametric manipulation of conflict and response competition using rapid mixed-trial event related fMRI. Neuroimage, 20(4): 2135-2141.
- Durston S, Tottenham N, Thomas KM, **Davidson MC**, Eigsti IM, Yang Y, Ulug AM, Casey BJ, (2003). Differential patterns of striatal activation in young children with and without ADHD. Biological Psychiatry, 53:871-878.
- Casey BJ, **Davidson MC**, Rosen B, (2002). Functional magnetic resonance imaging: basic principles and application to developmental science. Developmental Science, 5(3): 301-309.
- Casey BJ, Thomas KM, **Davidson MC**, Kunz K, Franzen PL, (2002). Dissociating striatal and hippocampal function developmentally with a stimulus-response compatibility task. Journal of Neuroscience, 22(19):8647-8652.
- Davidson MC**, Marrocco RT, (2000). Local infusion of scopolamine into intraparietal cortex alters covert orienting in rhesus monkeys. Journal of Neurophysiology, 83(3):1536-1549.
- Davidson MC**, Cutrell EB, Marrocco RT, (1999). Systemic scopolamine slows covert orienting in rhesus monkeys. Psychopharmacology, 142(1):1-8.
- Hayes AE, **Davidson MC**, Keele SW, Rafal RD, (1998). Toward a functional analysis of the basal ganglia. Journal of Cognitive Neuroscience, 10(2):178-198.
- Marrocco RT & **Davidson MC**, (1998). Neurochemistry of attention. In R Parasuraman, (ed.) Varieties of Attention. Cambridge MA: MIT Press. 35-50.

- Keele SW, **Davidson MC**, Hayes, AE, (1998). Sequential representation and the neural basis of motor skills. In J Piek, (ed.) Motor Control and Human Skill. 3-28.
- Witte EA, **Davidson MC**, Marrocco RT, (1997). Effects of altering brain cholinergic activity on orienting of attention: comparison of human and monkey performance. Psychopharmacology, 132(4):324-334.
- Marrocco RT, Witte EA, **Davidson MC**, (1994). Arousal Systems. Current Opinion in Neurobiology, 4(2):166-170.

Dissertation:

- Davidson MC, (1998). Attention mechanisms associated with covert orienting: A multilevel analysis in Rhesus Macaques. Doctoral Dissertation. University of Oregon, Eugene, OR.

Selected Poster Presentations:

- Stering PL, Ficco DF, Roberts JL, **Davidson MC** (2011). Cognitive Flexibility and Inhibitory Control: Developmental Differences across a Multi-Factor Switching Paradigm. Poster Presentation, Society for Research on Child Development.
- Davidson MC**, Shere AP, Falbo NJ, Ciccone BM, Richardson HN (2010). Effects of prenatal exercise and early social stress in male and female rat offspring. Poster Presentation, Society for Neuroscience.
- Davidson MC**, Ficco DF, Fossella JA (2009). The Impact of Physical Activity on Executive Attention Across Development: Interactions with Gender and Genetics. Platform Presentation, Society for Research on Child Development.
- Ficco DF, Kirkorian, HL, **Davidson MC** (2009). Physical Activity and Emotion Regulation: An fMRI Investigation. Poster Presentation, Society for Neuroscience.
- Astheimer LB, Fitzroy A, Sanders LD, **Davidson MC** (2008). Attention to hierarchical levels affects cortical processing across modality and dimension. Poster Presentation, CNS
- Davidson MC**, Sheres AS, Fossella JA, (2008). Physical activity and BDNF polymorphisms interact to modulate cognitive performance in a set-switching paradigm. Poster Presentation, Cognitive Neuroscience Society
- Ficco DF, Sodhi S, Malony LG, **Davidson MC**, (2008). Sex, Estrogen, and Developmental Changes in Visuo-Spatial Working Memory during Adolescence. Poster Presentation, Jean Piaget Society
- Davidson MC**, Ficco DF, Sodhi S, Malony LG (2008). Assessing the development of inhibitory control and cognitive flexibility in children, adolescents, and adults via a multi-level task switching paradigm. Poster Presentation, Jean Piaget Society
- Davidson MC**, Hare T, Watts R, Glover GH, Casey BJ, (2004). FMRI and DTI investigation of attention switching networks. Poster Presentation, Organization for Human Brain Mapping.
- Davidson MC**, Hare T, Glover GH, Casey BJ, (2004). Component analysis of attention switching. Poster Presentation, Cognitive Neuroscience Society.
- Davidson MC**, Horvitz JC, Tottenham N, Durston S, Fossella JA, Casey BJ, (2003). FMRI investigation of neural circuitry modulated by violations in stimulus and temporal expectations. Poster Presentation, Society for Neuroscience.
- Davidson MC**, Hara Y, Thomas KM, Martinez A, Casey BJ, (2003). Attention switching in children and adults: A developmental fMRI study. Poster Presentation, Organization of Human Brain Mapping.
- Davidson MC**, Horvitz JC, Tottenham N, Fossella JA, Casey BJ, (2002). FMRI investigation of saliency, expectation and reward circuitry. Poster Presentation, Society for Neuroscience.
- Davidson MC**, Fossella JA, Durston S, Tottenham N, Kunz KH, Casey BJ, (2002). Catecholamine genes, cognitive control and brain morphometry. Poster Presentation, CNS