

**Psych 370:
Neuroscience of Mental Illness
Spring 2009**

Prof. Rebecca Compton

Office: Sharpless 403, x1309

Drop-in office hours: Wed. 4-5:30pm, Thurs. 3-4pm or by appt

Course Description:

Examines neuroscience approaches to psychological disorders such as depression, anxiety disorders, and schizophrenia. This seminar will draw upon primary scientific research literature addressing neurophysiological and cognitive neuroscience approaches to psychopathology. Both promises and limitations of current knowledge will be evaluated.

Prerequisite: one 200-level course in biological psychology (Psych 217, 250, 260, or BMC Psych 218)

Course Requirements:

- **Presentations** (30% of course grade). Each student will be expected to deliver two 20-minute oral presentations during the course of the semester. Each presentation will focus in-depth on a specific primary research report related to that day's topic. The student will be expected to identify and locate a suitable research report with the help of the instructor, and to present the background, main methods, results, and conclusions of the study to the rest of the class, along with the student's own critical evaluation of the study.
- **Discussion questions** (20% of course grade). Students will be expected to submit brief discussion questions based on the week's reading. These discussion questions will be circulated to the class and will serve as the basis for class discussion. Each student will be expected to submit discussion questions for 20 of the 25 class periods with assigned readings.
- **Final paper** (30% of course grade). **Due on April 29 in class.** Each student will submit a final paper on a topic of his or her choosing. In the paper, the student must identify an unresolved question about the brain and a psychological disorder and must propose a research study to address that unresolved question. The paper should review the existing scholarly research on the topic to date, identify the unresolved issue and explain why it is important, propose a feasible study that would further our understanding, and finally explain the limitations of the proposed study.
- **Participation in discussion** (20% of course grade). Students are expected to attend class regularly and to be active participants in discussion.

Course Schedule:

I. Examining assumptions

Jan. 21. **Introduction to course**

Jan. 26. **Should neurology and psychiatry merge?**

Torrey, E.F. (2002). The year neurology almost took over psychiatry. *Psychiatric Times*, 19.

Martin, J.B. (2002). The integration of neurology, psychiatry, and neuroscience in the 21st century. *American Journal of Psychiatry*, 159, 695-704.

Pies, R. (2005). Why psychiatry and neurology cannot simply merge. *Journal of Neuropsychiatry and Clinical Neurosciences*, 17, 304-309.

Jan. 28. **The medical model of mental illness**

Murphy, D. (2006). The medical model and the foundations of psychiatric explanation. Ch. 4 in *Psychiatry in the Scientific Image*. Cambridge, MA: MIT Press.

II. Depression

Feb. 2. **Overview**

Hammen, C., & Watkins, E. (2008). Defining and diagnosing depression. *Depression*, 2nd ed. Hove: Psychology Press.

Atchley, R.A., & Ilardi, S.S. (2007). The promise of cognitive neuroscience for advancing depression research. *Cognitive Therapy and Research*, 31, 141-145.

Lilienfeld, S.O. (2007). Cognitive neuroscience and depression: Legitimate versus illegitimate reductionism and five challenges. *Cognitive Therapy and Research*, 31, 263-272.

Gotlib, I.H., & Hamilton, J.P. (2008). Neuroimaging and depression: Current status and unresolved issues. *Current Directions in Psychological Science*, 17, 159-163.

Feb. 4. **Frontal lobe abnormalities**

Nitschke, J.B., & Mackiewicz, K.L. (2005). Prefrontal and anterior cingulate contributions to volition in depression. *International Review of Neurobiology*, 67, 73-94.

Feb. 9. **Dysregulation of homeostatic systems**

Hammen, C., & Watkins, E. (2008). Biological aspects of depression [excerpts]. *Depression, 2nd ed.* Hove: Psychology Press.

Burke, H.M., et al. (2005). Depression and cortisol responses to psychological stress: A meta-analysis. *Psychoneuroendocrinology, 30*, 846-856.

Tsuno, N., et al. (2005). Sleep and depression. *Journal of Clinical Psychiatry, 66*, 1254-1269.

Feb. 11. **Neurogenesis hypothesis**

Jacobs, B. (2004). Depression: The brain finally gets into the act. *Current Directions in Psychological Science, 13*, 103-106.

Sapolsky, R.M. (2004). Is impaired neurogenesis relevant to the affective symptoms of depression? *Biological Psychiatry, 56*, 137-139.

Feb. 16. **Genetic influences**

Abbott, A. (2008). The brains of the family. *Nature, 454*, 154-157

Hariri, A.R., & Holmes, A. (2006). Genetics of emotional regulation: the role of the serotonin transporter in neural function. *Trends in Cognitive Sciences, 10*, 182-191.

Canli, T., & Lesch, K.-P. (2007). Long story short: The serotonin transporter in emotion regulation and social cognition. *Nature Neuroscience, 10*, 1103-1109.

Feb. 18. **Seasonal affective disorder; bipolar disorder**

Miller, A.L. (2005). Epidemiology, etiology, and natural treatment of seasonal affective disorder. *Alternative Medicine Review, 10*, 5-13.

DeMay, M.G., et al. (2007). Bipolar disorder and the frontal lobes. In B.L. Miller and J.L. Cummings (Eds.), *The human frontal lobes: Functions and disorders*. New York: Guilford.

Feb. 23. **Premenstrual and postpartum depression**

Rubinow, D.R., & Schmidt, P.J. (2006). Gonadal steroidal regulation of mood: The lessons of premenstrual syndrome. *Frontiers in Neuroendocrinology, 27*, 210-216.

Miller, L.J. (2002). Postpartum depression. *JAMA, 287*, 762-765.

Brockington, I. (2004). Postpartum psychiatric disorders. *Lancet, 363*, 303-310.

Feb. 25. **Experimental treatments**

Kennedy, S.H., & Giacobbe, P. (2007). Treatment resistant depression: Advances in somatic therapies. *Annals of Clinical Psychiatry, 19*, 279-287.

III. Anxiety disorders

Mar. 2. **Fear and phobias**

Rachman, S. (2004). The nature of anxiety. *Anxiety, 2nd Ed.* Hove: Psychology Press.

Davis, M. (2004). Functional neuroanatomy of anxiety and fear. In D.S. Charney & E.J. Nestler, Eds., *Neurobiology of Mental Illness, 2nd Ed.*, Oxford: Oxford University Press.

Mar. 4. **Panic**

Rachman, S. (2004). Panic and anxiety. *Anxiety, 2nd Ed.* Hove: Psychology Press.

Mar. 16. **Post-traumatic stress disorder**

Shin, L.M., et al. (2005). Structural and functional anatomy of PTSD: Findings from neuroimaging research. In J.J. Vasterling & C.R. Brown, Eds. *Neuropsychology of PTSD*. New York: Guilford.

Metzger, L.J. et al. (2005). Electrophysiology of PTSD. In J.J. Vasterling & C.R. Brown, Eds. *Neuropsychology of PTSD*. New York: Guilford.

Mar. 18. **Obsessive-compulsive disorder**

Rachman, S. (2004). Obsessions and compulsions. *Anxiety, 2nd Ed.* Hove: Psychology Press.

Swedo, S.E., & Snider, L.A. (2004). The neurobiology and treatment of obsessive-compulsive disorder. In D.S. Charney & E.J. Nestler, Eds., *Neurobiology of Mental Illness, 2nd Ed.*, Oxford: Oxford University Press.

IV. Schizophrenia

Mar. 23. **Frontal lobe abnormalities**

McKenna, P.J. (2007). The cardinal symptoms of schizophrenia. *Schizophrenia and Related Syndromes*. London: Routledge.

Ropacki, S.A.L., & Perry, W. (2007). Frontal lobe functioning in schizophrenia: Evidence from neuropsychology, cognitive neuroscience, and psychophysiology. In

B.L. Miller and J.L. Cummings (Eds.), *The human frontal lobes: Functions and disorders*. New York: Guilford.

Mar. 25. Temporal lobe abnormalities

Boyer, P., et al. (2007). Hippocampal abnormalities and memory deficits: New evidence of a strong pathophysiological link in schizophrenia. *Brain Research Reviews*, 54, 92-112.

Umbricht, D., & Krljes, S. (2005). Mismatch negativity in schizophrenia: A meta-analysis. *Schizophrenia Research*, 76, 1-23.

Mar. 30. Disruptions in regional connectivity

Friston, K.J. (1998). The disconnection hypothesis. *Schizophrenia Research*, 30, 115-125.

Ford, J.M., & Mathalon, D.H. (2005). Corollary discharge dysfunction in schizophrenia: Can it explain auditory hallucinations? *International Journal of Psychophysiology*, 58, 179-189.

Apr. 1. Neurochemical aspects

McKenna, P.J. (2007). The neurochemistry of schizophrenia. *Schizophrenia and Related Syndromes*. London: Routledge.

Apr. 6. Neurodevelopmental hypothesis

McKenna, P.J. (2007). The neurodevelopmental theory of schizophrenia. *Schizophrenia and Related Syndromes*. London: Routledge.

Apr. 8. Genetic contributions

McDonald, C., & Murphy, K.C. (2003). The new genetics of schizophrenia. *Psychiatric Clinics of North America*, 26, 41-63.

V. Autism

Apr. 13. Autism and the social brain

Zilbovicius, M., et al. (2006). Autism, the superior temporal sulcus and social perception. *Trends in Neurosciences*, 29, 359-366.

Iacoboni, M., & Dapretto, M. (2006). The mirror neuron system and the consequences of its dysfunction. *Nature Reviews Neuroscience*, 7, 942-951.

Apr. 15. Gender and hormones in autism

Baron-Cohen, S. (2002). The extreme male brain theory of autism. *Trends in Cognitive Sciences*, 6, 248-254.

Carter, C.S. (2007). Sex differences in oxytocin and vasopressin: Implications for autism spectrum disorders? *Behavioural Brain Research*, 176, 170-186.

Apr. 20. Origins of autism: genetic factors and the vaccine debate

Happé, F., et al. (2006). Time to give up on a single explanation for autism. *Nature Neuroscience*, 9, 1218-1220.

Silencing debate over autism [Editorial]. *Nature Neuroscience*, 10, 531.

Gernsbacher, M.A., et al. (2005). Three reasons not to believe in an autism epidemic. *Current Directions in Psychological Science*, 14, 55-58.

VI. Attention-deficit disorder

Apr. 22. Neurobiological approaches to ADHD

Biederman, J., & Faraone, S.V. (2005). Attention-deficit hyperactivity disorder. *Lancet*, 366, 237-248.

Bush, G., Valera, E., & Seidman, L.J. (2005). Functional neuroimaging of attention-deficit hyperactivity disorder: A review and suggested future directions. *Biological Psychiatry*, 57, 1273-1284.

VII. Substance abuse and addiction

Apr. 27. Neural substrates of abuse and addiction

Schoenbaum, G., et al. (2006). Orbitofrontal cortex, decision-making and drug addiction. *Trends in Neurosciences*, 29, 116-124.

Wilson, S.J., et al. (2004). Prefrontal responses to drug cues: A neurocognitive analysis. *Nature Neuroscience*, 7, 211-214.

VIII. Conclusions and critique

Apr. 29. Wrap-up.