

The Emotional Brain – Spring 2017

Structure:

Faculty Lectures will take place during the first 5 classes. Read the papers and participate in discussion.

Readings Presentations will begin on Feb 28. Each student will be responsible for one presentation during the semester. We will have 2-3 presentations each week. Each should last no more than 15 min, followed by discussion. *Stick to the time so that all papers can be presented.* Assume that you will talk longer than you expect so plan on speaking for less than 15 min. You can talk during the discussion as well. Each student has been randomly assigned to papers (see below). If you don't like your time or topic, find someone to swap with and let me know. Everyone is required to read the papers and participate in the discussion of the papers.

Midterm Exam. This will be held on March 7 and will consist of multiple-choice questions taken from the readings and lectures up to that point.

Term Paper Presentations will take place during the last three classes and will be on the topic of your final paper. You can expand upon the first in-class presentation or pick another topic.

Term Papers will be due May 9. This will be a write up of your final presentation topic. Due to the large number of students in the class, I am restricting the papers to 5 double-spaced pages, with Times Roman/Cambria 12 point-font.

Grading. Each of the categories below will be graded as A, B, C. Class participation will also be graded as ABC and will be used to add or subtract from your final grade. Lots of good participation turns a course grade of B to a B+ while sparse participation turns a B into a B-

- *Reading Presentation
- *Midterm (multiple-choice)
- *Term Paper Presentation
- *Term Paper

CLASS CALENDAR

- Jan. 24** Introduction - JL will present
- Jan. 31** History of the Emotional Brain: - JL will present
- Feb. 7** Fear and the Amygdala- JL will present
- Feb. 14** Rethinking the Emotional Brain - JL will present
- Feb. 21** Human Affective Neuroscience - Liz Phelps will present
- Feb. 28** Memory and Emotion - student presentations
- Mar. 7** Mid-term exam (20 minutes)
Aggression - student presentations
- Mar. 14** SPRING BREAK
- Mar. 21** Stress - student presentations
- Mar. 28** Reward and Addiction - student presentations
- Apr. 4** Emotional Pathology: Anxiety - student presentations
- Apr. 11** Emotional Pathology: Depression- student presentations
- Apr. 18** Term Paper Presentations
- Apr. 25** Term Paper Presentations
- May 2** Term Paper Presentations
- May 9** Final Paper Due-(5 page max write up of your final presentation. SEE INSTRUCTIONS ABOVE UNDER "STRUCTURE")

Assignments

Readings Presentations

- Feb. 28 Parth Kamdar, Oliya Clarkson, Daliah Ross
Mar. 7 Tiffany Martin, Kristen Olivieri, Yvonne Bowman
Mar. 21 Mohammed Ismail, Elimelech Wieder, Alejandra Patino
Mar. 28 Pooja Pokharna, Julia Pai, Kyla Pagani
Apr. 4 Anthony Oganov, Dylan Brown, Cassandra Draus, Nicole Leal
Apr. 11 Elad Mashiach, Daniel Roca-Atkinson, Sanket Aggarwal, Jiwon Kim

Term Paper Presentations

- Apr. 18 Tiffany Martin, Kristen Olivieri, Yvonne Bowman, Mohammed Ismail, Parth Kamdar, Oliya Clarkson, Daliah Ross
Apr. 25 Dylan Brown, Cassandra Draus, Elad Mashiach, Daniel Roca-Atkinson, Sanket Aggarwal, Jiwon Kim, Nicole Leal
May 2 Elimelech Wieder, Alejandra Patino, Pooja Pokharna, Julia Pai, Kyla Pagani, Anthony Oganov

READINGS

- Jan. 24 Introduction** —JL will present
- Jan. 31 History of the Emotional Brain**—JL will present
Emotional Brain Chapter 3 – Blood, Sweat, and Tears
Emotional Brain Chapter 4 – The Holy Grail
Emotional Brain Chapter 5 – The Way Were, p. 104-125
- Feb. 7 Fear and the Amygdala**—JL will present
Anxious Chapter 4 – The Defensive Brain
Fanselow MS, Poulos AM (2005) The neuroscience of mammalian associative learning. *Annu Rev Psychol* 56:207-234.
Adolphs R (2013) The biology of fear. *Curr Biol* 23:R79-93.
LeDoux JE, Moscarello J, Sears R, Campese V (2017) The birth, death and resurrection of avoidance: a reconceptualization of a troubled paradigm, p 2-3 “The Death of Avoidance”
- Feb. 14 Rethinking the Emotional Brain**—JL will present
Evolution of Life video - <https://www.youtube.com/watch?v=pktDqFy5IcE>
LeDoux J (2012) Rethinking the emotional brain. *Neuron* 73:653-676.
Anxious Chapter 5 – Have We Inherited Emotional States of Mind
Anxious Chapter 8 – Feeling It: Emotional Consciousness
Barrett LF (2006) Are Emotions Natural Kinds? *Perspectives on Psychological Science* 1:28-58.
- Feb. 21 Human Affective Neuroscience**—Liz Phelps will present
Phelps EA (2006) Emotion and cognition: insights from studies of the human amygdala. *Annu Rev Psychol* 57:27-53.
Kringelbach ML (2005) The human orbitofrontal cortex: linking reward to hedonic experience. *Nat Rev Neurosci* 6:691-702.
Hartley CA, Phelps EA (2010) Changing fear: the neurocircuitry of emotion regulation. *Neuropsychopharmacology* 35:136-146.
- Feb. 28 Memory and Emotion**
The Emotional Brain Chapter 7- Remembrance of Emotions Past
Hirst W, Phelps EA (2016) Flashbulb Memories. *Curr Dir Psychol Sci* 25:36-41.
McGaugh JL (2000) Memory--a century of consolidation. *Science* 287:248-251.
Alberini CM, LeDoux JE (2013) Memory reconsolidation. *Curr Biol* 23:R746-750.

Mar. 7 Mid-term exam (20 minutes)

Aggression

Sternson SM (2013) Hypothalamic survival circuits: blueprints for purposive behaviors. *Neuron* 77:810-824.

Anderson DJ (2012) Optogenetics, sex, and violence in the brain: implications for psychiatry. *Biol Psychiatry* 71:1081-1089.

Anholt RR, Mackay TF (2012) Genetics of aggression. *Annu Rev Genet* 46:145-164.

Mar. 14 SPRING BREAK

Mar. 21 Stress

McEwen BS, Bowles NP, Gray JD, Hill MN, Hunter RG, Karatsoreos IN, Nasca C (2015) Mechanisms of stress in the brain. *Nat Neurosci* 18:1353-1363.

Krugers HJ, Joels M (2014) Long-lasting Consequences of Early Life Stress on Brain Structure, Emotion and Cognition. *Curr Top Behav Neurosci* 18:81-92.

Sorrells SF, Caso JR, Munhoz CD, Sapolsky RM (2009) The stressed CNS: when glucocorticoids aggravate inflammation. *Neuron* 64:33-39.

Mar. 28 Reward and Addiction

Everitt BJ, Robbins TW (2016) Drug Addiction: Updating Actions to Habits to Compulsions Ten Years On. *Annu Rev Psychol* 67:23-50.

Nestler EJ (2014) Epigenetic mechanisms of drug addiction. *Neuropharmacology* 76 Pt B:259-268.

Robinson TE, Berridge KC (2008) Review. The incentive sensitization theory of addiction: some current issues. *Philos Trans R Soc Lond B Biol Sci* 363:3137-3146.

JL Comments:

Torregrossa MM, Taylor JR (2012) Learning to forget: manipulating extinction and reconsolidation processes to treat addiction. *Psychopharmacology (Berl)* 226:659-672.

Xue YX, Luo YX, Wu P, Shi HS, Xue LF, Chen C, Zhu WL, Ding ZB, Bao YP, Shi J, Epstein DH, Shaham Y, Lu L (2012) A memory retrieval-extinction procedure to prevent drug craving and relapse. *Science* 336:241-245.

Apr. 4. *Emotional Pathology: Anxiety*

Lang PJ, McTeague LM, Bradley MM (2014) Pathological anxiety and function/dysfunction in the brain's fear/defense circuitry. *Restor Neurol Neurosci* 32:63-77.

Grupe DW, Nitschke JB (2013) Uncertainty and anticipation in anxiety: an integrated neurobiological and psychological perspective. *Nat Rev Neurosci* 14:488-501.

Rabinak CA, Phan KL (2014) Cannabinoid modulation of fear extinction brain circuits: a novel target to advance anxiety treatment. *Curr Pharm Des* 20:2212-2217.

Calhoon GG, Tye KM (2015) Resolving the neural circuits of anxiety. *Nat Neurosci* 18:1394-1404.

Apr. 11 *Emotional Pathology: Depression*

Foster JA, McVey Neufeld KA (2013) Gut-brain axis: how the microbiome influences anxiety and depression. *Trends Neurosci* 36:305-312.

Holtzheimer PE, Mayberg HS (2011) Deep brain stimulation for psychiatric disorders. *Annu Rev Neurosci* 34:289-307.

Boccia M, Piccardi L, Guariglia P (2016) How treatment affects the brain: meta-analysis evidence of neural substrates underpinning drug therapy and psychotherapy in major depression. *Brain Imaging Behav* 10:619-627.

Krishnan V, Nestler EJ (2010) Linking molecules to mood: new insight into the biology of depression. *Am J Psychiatry* 167:1305-1320.