PSY 620-42: Neuroscience: Applications in Psychology
(MON & WED 2:30 - 3:50)
Room B316

This course focuses on how research and theory from the neurosciences can be applied to better understand normal and abnormal human behavior. One important aim of this course is for you to develop a sense of key of phenomena and methods in cognitive neuroscience. Although neurobiology is one of the hottest research areas right now, another important aim of this course is for you to be able to critically evaluate the explanations provided by this research and not fall for its "seductive allure". Although this course spans the neural mechanisms of basic cognitive and emotional functions, the course will also emphasize translational research.

In the first portion of the course, we will discuss basic functional neuroanatomy and follow it up with how neuroscience (primarily with the imaging technique) can inform our understanding of cognition over and above what we already know (for example, from behavioral or clinical observation). We will then discuss some of the issues regarding brain-related explanations of normal and abnormal cognition and emotion (particularly the kinds the media likes), stigma, and neuroplasticity. After covering this introductory material we take an RDoc approach and start with the topics of emotion and motivation. After this, we will delve into the major areas of cognitive neuroscience, including perception, attention, cognitive control, memory, learning, decision making, and social cognition. Finally, we will end with whether this cognitive/affective neuroscience research has been effectively translated into practical applications, as well as the barriers that stand in the way of this translation. The course material will expose you to quite a variety of issues and hopefully will challenge your thinking about some of them.

For each week, the syllabus lists the required and recommended readings and I can provide you with an electronic copy of the readings. The format of the class meetings includes lecture and discussion, with emphasis on interactive discussion.

Thought paragraph: Throughout the semester, prior to each class meeting, please identify 2 or 3 important, confusing, controversial, or otherwise worthy issues for discussion and write up some brief comments about each issue (maximum 1 single spaced paragraph). The thought paragraph should not be summaries of the week's readings, but can take many forms such as critiquing the points raised by some authors, integrating ideas across reading, relating them to your own research, developing hypothesis, and identifying and critiquing unstated assumptions in the readings. Please email your comments by 5:00 PM on the day before the class to me and the rest of the class and please do raise issues/questions in the class.

Final Paper: The final paper will be due during finals week. The format of the paper will be same as a F31 NIMH pre-doctoral training grant. Although you can pick a topic of choice, it is preferred that you propose a study that will use cognitive neuroscience paradigms and techniques to address an important question in your area of interest.

Class 1: Functional Neuroanatomy: Overview

Monday, January 27, 2020

Syllabus and Functional Neuroanatomy overview

Class 2: Functional Neuroanatomy: Overview
Wednesday, January 29, 2020

Required Reading
Read Chapter 3 (Gross Anatomy and General Organization of the Nervous System)
Nolte's Essentials of the Human Brain, Second Edition

This book is available in Ebook form on our university library website. If you are off campus you will have to click on links and access using your NetID

Class 3: Behavioral Neuroanatomy: Overview
Monday, February 3, 2020

Required Reading
Mesulam, M. M. (1998). From sensation to cognition. *Brain, 121 (Pt 6)*, 1013-1052.

Recommended Reading
Mesulam, M. M. (2000). Behavioral Neuroanatomy in *Principles of behavioral and cognitive neurology* (2nd ed.). New York, NY: Oxford University Press.

Class 4: Methods in Neuroscience
Wednesday, February 5, 2020

Required Reading (next week will have same readings, we will not discuss readings today but your classmates will present how they do analyses etc using neuroscience methods)
Chapter 1. Purves, Dale. Neuroscience. Sunderland, Mass: Sinauer Associates, Publishers, 2018 (uploaded on blackboard)
Forstmann, B. U., and Wagenmakers, E.-J. (2015). *Model-Based Cognitive Neuroscience: A Conceptual Introduction*. New York, NY: Springer. doi: 10.1007/978-1-4939-2236-9_7 (uploaded on blackboard)

Recommended Reading
Raichle, M. E. (2010). Two views of brain function. *Trends Cogn Sci, 14*(4), 180-190.
Logothetis, N. K., Pauls, J., Augath, M., Trinath, T., & Oeltermann, A. (2001). Neurophysiological investigation of the basis of the fMRI signal. *Nature, 412*(6843), 150-157.
Logothetis, N. K. (2008). What we can do and what we cannot do with fMRI. *Nature, 453*(7197), 869-878.
Raichle, M. E. (1994). Visualizing the mind. *Sci Am, 270*(4), 58-64.

Class 5: Methods in Neuroscience
Monday, February 10, 2020

Required Reading

Chapter 1. Purves, Dale. Neuroscience. Sunderland, Mass: Sinauer Associates, Publishers, 2018 (uploaded on blackboard)

Forstmann, B. U., and Wagenmakers, E.-J. (2015). *Model-Based Cognitive Neuroscience: A Conceptual Introduction*. New York, NY: Springer. doi: 10.1007/978-1-4939-2236-9_7 (uploaded on blackboard)

Class 6: What can Neuroscience tell us about Cognitive Psychology?
Wednesday, February 12, 2020

Required Reading

Poldrack, R. A. (2008). The role of fMRI in cognitive neuroscience: where do we stand? *Curr Opin Neurobiol, 18*(2), 223-227. (Remember the bases of your RDoc is that neural measures tell us something about cognition and emotion)

Krakauer JW, Ghazanfar AA, Gomez-Marin A, MacIver MA, Poeppel D. Neuroscience Needs Behavior: Correcting a Reductionist Bias. *Neuron.* 2017 Feb 8;93(3):480-490. doi: 10.1016/j.neuron.2016.12.041. Review. PubMed PMID: 28182904.

https://www.wnycstudios.org/podcasts/radiolab/articles/276577-rebroadcast-emergence (this is a radiolab podcast, listen to whole thing but the one relevant is about how behavior (and probably symptoms) emerges from neural activity

Recommended Reading

Coltheart, M. (2006). What has functional neuroimaging told us about the mind (so far)? *Cortex, 42*(3), 323-331.

Henson, R. (2005). What can functional neuroimaging tell the experimental psychologist? *Q J Exp Psychol A, 58*(2), 193-233.

Weber, M. J., & Thompson-Schill, S. L. (2010). Functional neuroimaging can support causal claims about brain function. *J Cogn Neurosci, 22*(11), 2415-2416.

Norman, K. A., Polyn, S. M., Detre, G. J., & Haxby, J. V. (2006). Beyond mind-reading: multi-voxel pattern analysis of fMRI data. *Trends Cogn Sci, 10*(9), 424-430.

Kay, K. N., Naselaris, T., Prenger, R. J., & Gallant, J. L. (2008). Identifying natural images from human brain activity. *Nature, 452*(7185), 352-355.

Class 7: What can Neuroscience tell us about Clinical Psychology?
Monday, February 17, 2020

Required Reading

Abi-Dargham, A. & Horga, G. The search for imaging biomarkers in psychiatric disorders. *Nat. Med.* **22**, 1248–1255 (2016).

Van Dam NT, O'Connor D, Marcelle ET, Ho EJ, Cameron Craddock R, Tobe RH, Gabbay V, Hudziak JJ, Xavier Castellanos F, Leventhal BL, Milham MP. Data-Driven Phenotypic Categorization for Neurobiological Analyses: Beyond DSM-5 Labels. Biol

Psychiatry. 2016 Jul 19. pii: S0006-3223(16)32586-0. doi:10.1016/j.biopsych.2016.06.027.

https://thepsychologist.bps.org.uk/volume-28/april-2015/what-has-neuroscience-ever-done-us

Class 8: Ethical Issues regarding Neuroscience Research (I)
Wednesday, February 19, 2020

Required Reading

Miller, G. A. (2010). Mistreating psychology in the decade of the brain. *Pers in Psych Sci*, *5*(6), 716-743.

Weisberg, D. S., Keil, F. C., Goodstein, J., Rawson, E., & Gray, J. R. (2008). The seductive allure of neuroscience explanations. *J Cogn Neurosci*, *20*(3), 470-477.

Weisberg, D. S., Taylor, J. C., & Hopkins, E. J. (2015). Deconstructing the seductive allure of neuroscience explanations. Judgment and Decision Making, 10(5), 429.

Class 9: Measurement Issues regarding Neuroscience Research (II)
Monday, February 24, 2020

Required Reading

Noble, S., Scheinost, D., & Constable, R.D. A decade of test-retest reliability of functional connectivity: A systematic review and meta-analysis, *NeuroImage*, Volume 203, 2019, 116157, ISSN 1053-8119, https://doi.org/10.1016/j.neuroimage.2019.116157. (http://www.sciencedirect.com/science/article/pii/S1053811919307487)

Sapolsky, R.M. *Nat. Neurosci.* **19**, 1387–1389 (2016).

https://www.wired.com/2016/07/dont-quick-flush-15-years-brain-scan-studies/

https://erpinfo.org/blog/2019/2/19/reliability-and-precision

Recommended Reading

Stein, D. J., Daniels, W. M. U., Savitz, J., & Harvey, B. H. (2008). Brain-derived neurotropic factor: The neurotrophin hypothesis of psychopathology. *CNS Spectrums*, *13*(11), 945-949.

Kozak, M. J., & Miller, G. A. (1982). Hypothetical constructs versus intervening variables: A re-appraisal of the three-systems model of anxiety assessment. *Behavioral Assessment*, *4*(3), 347-358.

Class 10: Negative Valence
Wednesday, February 26, 2020

Required Reading

Pessoa, L., & Adolphs, R. (2010). Emotion processing and the amygdala: from a 'low road' to 'many roads' of evaluating biological significance. *Nat Rev Neurosci.11(11), 773-783.*

LeDoux JE, Pine DS: Using neuroscience to help understand fear and anxiety: a two-system framework. *Am J Psychiatry* 2016; 173:1083–1093

Barrett, L. F., Quigley K. S., & Hamilton P. (2016). An active inference theory of allostasis and interoception in depression. *Phil. Trans. R. Soc. B*, 371, 20160001. doi http://dx.doi.org/10.1098/rstb.2016.0011.

Recommended Reading

https://www.ted.com/talks/lisa_feldman_barrett_you_aren_t_at_the_mercy_of_your_emotions_your_brain_creates_them/discussion?referrer=playlist-the_most_popular_ted_talks_of_2018

Adolphs, R., Mlodinow, L., & Barrett, L. F. (2019). What is an emotion? *Current Biology*, 29, R1-R5.

Fanselow, M. S. & Pennington, Z. T. (2017) The Danger of LeDoux and Pine's Two-System Framework for Fear. American Journal of Psychiatry, 174, 1120–1121

Mobbs, D., Adolphs, R., Fanselow, M.S., Barrett, L.F., LeDoux, J.E., Ressler, K., Tye, K.M. (2019) Viewpoints: Approaches to defining and investigating fear. Nat Neurosci., 22, 1205-1216.

Jin, J., Zelano, C., Gottfried, J.G., Mohanty, A. (2015). Human amygdala represents the complete spectrum of subjective valence. *Journal of Neuroscience*, 35, 15145-15156.

Pessoa, L. (2008). On the relationship between emotion and cognition. *Nat Rev Neurosci*, *9*(2), 148-158.

Class 11: Negative Valence (Learning)
Monday, March 2, 2020

Required Reading

Schiller, D., & Delgado, M. R. (2010). Overlapping neural systems mediating extinction, reversal and regulation of fear. *Trends Cogn Sci*, *14*(6), 268-276.

Dunsmoor JE, Murphy GL. (2015). Categories, concepts, and conditioning: how humans generalize fear. Trends Cogn Sci. Feb; 19(2): 73-77.

Herry, C., Ciocchi, S., Senn, V., Demmou, L., Muller, C., & Luthi, A. (2008). Switching on and off fear by distinct neuronal circuits. *Nature*, *454*(7204), 600-606.

Recommended Reading

Li, W., Howard, J. D., Parrish, T. B., & Gottfried, J. A. (2008). Aversive learning enhances perceptual and cortical discrimination of indiscriminable odor cues. *Science*, *319*(5871), 1842-1845.

Herry, C., Ferraguti, F., Singewald, N., Letzkus, J. J., Ehrlich, I., & Luthi, A. (2010). Neuronal circuits of fear extinction. *Eur J Neurosci*, *31*(4), 599-612.

Schiller, D., Levy, I., Niv, Y., LeDoux, J. E., & Phelps, E. A. (2008). From fear to safety and back: reversal of fear in the human brain. *J Neurosci*, *28*(45), 11517-11525.

Schiller, D., Monfils, M. H., Raio, C. M., Johnson, D. C., Ledoux, J. E., & Phelps, E. A. (2010). Preventing the return of fear in humans using reconsolidation update mechanisms. *Nature*, *463*(7277), 49-53.

Class 12: Positive Valence
Wednesday, March 4, 2020

Required Reading

O'Doherty, J. P. (2004). Reward representations and reward-related learning in the human brain: insights from neuroimaging. *Curr Opin Neurobiol, 14*(6), 769-776.

Tremblay, L., & Schultz, W. (1999). Relative reward preference in primate orbitofrontal cortex. *Nature, 398*(6729), 704-708.

Cox, J., Witten, I.B. Striatal circuits for reward learning and decision-making. *Nat Rev Neurosci* **20,** 482–494 (2019). https://doi.org/10.1038/s41583-019-0189-2

Recommended Reading

Gottfried, J. A., O'Doherty, J., & Dolan, R. J. (2003). Encoding predictive reward value in human amygdala and orbitofrontal cortex. *Science, 301*(5636), 1104-1107.

Rolls, E. T., & Grabenhorst, F. (2008). The orbitofrontal cortex and beyond: from affect to decision-making. *Prog Neurobiol, 86*(3), 216-244.

Bewernick, B. H., Hurlemann, R., Matusch, A., Kayser, S., Grubert, C., Hadrysiewicz, B., et al. (2010). Nucleus accumbens deep brain stimulation decreases ratings of depression and anxiety in treatment-resistant depression. *Biol Psychiatry, 67*(2), 110-116.

Oler, J. A., Fox, A. S., Shelton, S. E., Rogers, J., Dyer, T. D., Davidson, R. J., et al. (2010). Amygdalar and hippocampal substrates of anxious temperament differ in their heritability. *Nature, 466*(7308), 864-868.

Class 13: Negative and Positive Valence Networks
Monday, March 9, 2020

Required Reading

Jin J, Van Snellenberg JX, Perlman G, DeLorenzo C, Klein DN, Kotov R, Mohanty A. (2019). Intrinsic neural circuitry of depression in adolescent females. J Child Psychol Psychiatry. Sep 12; PubMed PMID: 31512744.

Baker, JT., Dillon, D.G. Patrick, L.M., Roffman, J.L., Brady, R.O., Pizzagalli, D.A., Öngür, D., & Holmes, A.J. Functional connectomics of affective and psychotic pathology. Proceedings of the National Academy of Sciences Apr 2019, 116 (18) 9050-9059; DOI: 10.1073/pnas.1820780116

Class 14: Perception
Wednesday, March 11, 2020

Required Reading

Clark, A. (2013). Whatever next? Predictive brains, situated agents, and the future of cognitive science. Behavioral and Brain Sciences, 36(03), 181-204.

Summerfield C and de Lange FP (2014) Expectation in perceptual decision making: neural and computational mechanisms. Nat Rev Neurosci 15:745–756.

Recommended Reading

Rushworth, M. F., Mars, R. B., & Summerfield, C. (2009). General mechanisms for making decisions? *Curr Opin Neurobiol, 19*(1), 75-83.

Yang, T., & Shadlen, M. N. (2007). Probabilistic reasoning by neurons. *Nature, 447*(7148), 1075-1080.

March 16 & 18, 2020
Spring Break

Class 15: Perception & Psychopathology
Monday, March 23, 2020

Required Reading

Fletcher, P. C., & Frith, C. D. (2009). Perceiving is believing: a Bayesian approach to explaining the positive symptoms of schizophrenia. *Nat Rev Neurosci, 10*(1), 48-58.

Sterzer P, Adams RA, Fletcher P et al. The predictive coding account of psychosis. Biol Psychiatry 2018; 84:634-43

Recommended Reading

Horga G, Abi-Dargham A. An integrative framework for perceptual disturbances in psychosis.Nat Rev Neurosci. 2019 Dec;20(12):763-778. doi: 10.1038/s41583-019-0234-1. Review. PMID: 31712782

Garety, P. A., Kuipers, E., Fowler, D., Freeman, D., & Bebbington, P. E. (2001). A cognitive model of the positive symptoms of psychosis. *Psychol Med, 31*(2), 189-195.

Bell, V., Halligan, P. W., & Ellis, H. D. (2006). Explaining delusions: a cognitive perspective. *Trends Cogn Sci, 10*(5), 219-226.

Class 16: Attention
Wednesday, March 25, 2020

Required Reading

Kastner, S., & Ungerleider (2000). Mechanisms of visual attention in the human cortex. *Annu. Rev. Neurosci, 23*, 315-341.

Corbetta, M., & Shulman, G. L. (2002). Control of goal-directed and stimulus-driven attention in the brain. *Nat Rev Neurosci, 3*(3), 201-215.

Recommended Reading

Moran, J., & Desimone, R. (1985). Selective attention gates visual processing in the extrastriate cortex. *Science, 229*(4715), 782-784.

Maunsell, J.H.R., & Treue, S. (2006). Feature-based attention in visual cortex. *Trends Neurosci. 29*, 317-322.

Class 17: Attention & Psychopathology
Monday, March 30, 2020

Required Reading

Rosenberg, M.D. et al. A neuromarker of sustained attention from whole-brain functional connectivity. *Nat. Neurosci.* **19**, 165–171 (2016).

Castellanos FX, Tannock R: Neuroscience of attention-deficit/ hyperactivity disorder: the search for endophenotypes. Nat Rev Neurosci 2002; 3:617–628

Recommended Reading

Mesulam, M. M. (1999). Spatial attention and neglect: parietal, frontal and cingulate contributions to the mental representation and attentional targeting of salient extrapersonal events. *Philos Trans R Soc Lond B Biol Sci, 354*(1387), 1325-1346.

Buschman, T. J., & Miller, E. K. (2007). Top-down versus bottom-up control of attention in the prefrontal and posterior parietal cortices. *Science, 315*(5820), 1860-1862.

Gottlieb J (2007). From thought to action: the parietal cortex as a bridge between perception, action, and cognition. *Neuron, 53,* 9-16.

Class 18: Attention & Emotion
Wednesday, April 01, 2020

Required Reading

Vuilleumier, P. (2005). How brains beware: neural mechanisms of emotional attention. *Trends Cogn Sci, 9*(12), 585-594.

Pessoa, L. (2005). To what extent are emotional visual stimuli processed without attention and awareness? *Current Opinion in Neurobiology, 15*(2), 188-196.

Sussman, T.J., Weinberg, A., *Szekely, A., Proudfit, G.H., Mohanty, A. (2016). Here comes trouble: Prior threat-related information enhances perception. *Cerebral Cortex*, doi:10.1093/cercor/bhw104.

Recommended Reading

Lavie, N. (2010) Attention, Distraction and Cognitive Control under Load. *Current Directions in Psychological Science*.

Dvorak-Bertsch, J. D., Curtin, J. J., Rubinstein, T. J., & Newman, J. P. (2007). Anxiety moderates the interplay between cognitive and affective processing. *Psychological Science, 18*, 699-705.

Mevorach, C., Hodsoll, J., Allen, H., Shalev, L., & Humphreys, G. (2010). Ignoring the elephant in the room: a neural circuit to downregulate salience. *J Neurosci, 30*(17), 6072-6079.

Derakshan, N., Santos, R., & Calvo, M. G. (2007). Anxiety and cognitive performance: Attentional control theory. *Emotion, 7*(2), 336-353.

Mohanty, A., Egner, T., Monti, J. M., & Mesulam, M. M. (2009). Search for a threatening target triggers limbic guidance of spatial attention. *J Neurosci, 29*(34), 10563-1057

Class 19: Working Memory & Cognitive Control (I)
Monday, April 06, 2020

Required Reading

Kerns, J. G., Cohen, J. D., MacDonald, A. W., 3rd, Cho, R. Y., Stenger, V. A., & Carter, C. S. (2004). Anterior cingulate conflict monitoring and adjustments in control. *Science, 303*(5660), 1023-1026.

Egner, T., & Hirsch, J. (2005). Cognitive control mechanisms resolve conflict through cortical amplification of task-relevant information. *Nat Neurosci, 8*(12), 1784-1790.

Recommended Reading

MacDonald, A. W., 3rd, Cohen, J. D., Stenger, V. A., & Carter, C. S. (2000). Dissociating the role of the dorsolateral prefrontal and anterior cingulate cortex in cognitive control. *Science, 288*(5472), 1835-1838.

Class 20: Working Memory & Cognitive Control (II)
Wednesday, April 08, 2020

Required Reading

Braver, T. S., Barch, D. M., & Cohen, J. D. (1999). Cognition and control in schizophrenia: a computational model of dopamine and prefrontal function. *Biol Psychiatry, 46*(3), 312-328.

Barch, D. M. (2005). The cognitive neuroscience of schizophrenia. *Annu Rev Clin Psychol, 1*, 321-353.

Burgess, G. C., Depue, B. E., Ruzic, L., Willcutt, E. G., Du, Y. P., & Banich, M. T. (2010). Attentional control activation relates to working memory in attention-deficit/hyperactivity disorder. *Biol Psychiatry, 67*(7), 632-640.

Recommended Reading

Tomita, H., Ohbayashi, M., Nakahara, K., Hasegawa, I., & Miyashita, Y. (1999). Top-down signal from prefrontal cortex in executive control of memory retrieval. *Nature, 401*(6754), 699-703.

Class 21: Working Memory & Cognitive Control (III)
Monday, April 13, 2020

Required Reading

Etkin, A., Egner, T., Peraza, D. M., Kandel, E. R., & Hirsch, J. (2006). Resolving emotional conflict: a role for the rostral anterior cingulate cortex in modulating activity in the amygdala. *Neuron, 51*(6), 871-882.

Bishop, S. J. (2009). Trait anxiety and impoverished prefrontal control of attention. *Nat Neurosci, 12*(1), 92-98

Recommended Reading

Bishop, S., Duncan, J., Brett, M., & Lawrence, A. D. (2004). Prefrontal cortical function and anxiety: controlling attention to threat-related stimuli. *Nat Neurosci, 7*(2), 184-188.

Engels, A. S., Heller, W., Mohanty, A., Herrington, J. D., Banich, M. T., Webb, A. G., et al. (2007). Specificity of regional brain activity in anxiety types during emotion processing. *Psychophysiology, 44*(3), 352-363.

Pizzagalli, D., Pascual-Marqui, R. D., Nitschke, J. B., Oakes, T. R., Larson, C. L., Abercrombie, H. C., et al. (2001). Anterior cingulate activity as a predictor of degree of treatment

response in major depression: evidence from brain electrical tomography analysis. *Am J Psychiatry, 158*(3), 405-415.

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Class 22: Memory (I)
Wednesday, April 15, 2020

Required Reading

Moscovitch, M., Nadel, L., Winocur, G., Gilboa, A., & Rosenbaum, R. S. (2006). The cognitive neuroscience of remote episodic, semantic and spatial memory. *Current Opinion in Neurobiology, 16*(2), 179-190.

Squire LR, Wixted JT. (2011). The cognitive neuroscience of human memory since H.M. Annu Rev Neurosci.; 34: 259-88.

Recommended Reading

Dudai, Y. (2004). The neurobiology of consolidations, or, how stable is the engram? *Annu Rev Psychol, 55*, 51-86.

Gabrieli, J. D. (1998). Cognitive neuroscience of human memory. *Annu Rev Psychol, 49*, 87-115.

Eichenbaum, H., Dudchenko, P., Wood, E., Shapiro, M., & Tanila, H. (1999). The hippocampus, memory, and place cells: is it spatial memory or a memory space? *Neuron, 23*(2), 209-226.

Eichenbaum, H. (2003). How does the hippocampus contribute to memory? *Trends Cogn Sci, 7*(10), 427-429.

Class 23: Memory (II)
Monday, April 20, 2020

Required Reading

Labar, K. S. (2007). Beyond Fear Emotional Memory Mechanisms in the Human Brain. *Curr Dir Psychol Sci, 16*(4), 173-177.

Brewin CR. The nature and significance of memory disturbance in posttraumatic stress disorder. Annu. Rev. Clin. Psychol. 2011; 7:203–227.

Mather M, Sutherland MR. Arousal-biased competition in perception and memory. Perspect. Psychol. Sci. 2011;6:114–133.

Recommended Reading

Sacco, T., & Sacchetti, B. (2010). Role of secondary sensory cortices in emotional memory storage and retrieval in rats. *Science, 329*(5992), 649-656.

Lee, I., Griffin, A. L., Zilli, E. A., Eichenbaum, H., & Hasselmo, M. E. (2006). Gradual translocation of spatial correlates of neuronal firing in the hippocampus toward prospective reward locations. *Neuron, 51*(5), 639-650.

Class 24: Memory (III)
Wednesday, April 22, 2020

Dębiec, J. Memory Reconsolidation Processes and Posttraumatic Stress Disorder: Promises and Challenges of Translational Research. Biological Psychiatry, Volume 71, Issue 4, 284 – 285.
Depue, B. E., Curran, T., & Banich, M. T. (2007). Prefrontal regions orchestrate suppression of emotional memories via a two-phase process. *Science, 317*(5835), 215-219.
Kindt M, Soeter M, Vervliet B. Beyond extinction: erasing human fear responses and preventing the return of fear. Nature Neuroscience.

Class 25: Decision Making & Neuroeconomics
Monday, April 27, 2020

Required Reading
Platt, M. L., & Huettel, S. A. (2008). Risky business: the neuroeconomics of decision making under uncertainty. *Nat Neurosci, 11*(4), 398-403.
Kenneth, K. T., King-Casas, B., & Montague, P. R. (2010). Neuroeconomic approaches to mental disorders. *Neuron, 67,* 543-554

Recommended Reading
Loewenstein, G., Rick, S., & Cohen, J. D. (2008). Neuroeconomics. *Annu Rev Psychol, 59*, 647-672.
Platt, M. L., & Glimcher, P. W. (1999). Neural correlates of decision variables in parietal cortex. *Nature, 400*(6741), 233-238.
Montague, P. R., & Berns, G. S. (2002). Neural economics and the biological substrates of valuation. *Neuron, 36*(2), 265-284.

Class 26: Social Cognition (I)
Wednesday, April 29, 2020

Required Reading
Cacioppo, J. T. (2002). Social neuroscience: understanding the pieces fosters understanding the whole and vice versa. *Am Psychol, 57*(11), 819-831.
Bechara, A. (2002). The neurology of social cognition. *Brain, 125*(Pt 8), 1673-1675.
Rizzolatti, G., & Fabbri-Destro, M. (2008). The mirror system and its role in social cognition. *Curr Opin Neurobiol, 18*(2), 179-184.
http://www.talkingbrains.org/2010/03/mirror-neurons-unfalsifiable-theory.html

Class 27: Social Cognition (II)
Wednesday, May 04, 2020

Class 28: Translating Neuroscience Research (II)
Monday, May 06, 2020

Required Reading
Carter, C. S., & Barch, D. M. (2007). Cognitive neuroscience-based approaches to measuring and improving treatment effects on cognition in schizophrenia: the CNTRICS initiative. *Schizophr Bull, 33*(5), 1131-1137.

Woo CW, Chang LJ, Lindquist MA, Wager TD. Building better biomarkers: brain models in translational neuroimaging. Nat Neurosci. 2017 Feb 23;20(3):365-377. doi: 10.1038/nn.4478. Review. PubMed PMID: 28230847; PubMed Central PMCID:PMC5988350.

Cohen, J. D., & Insel, T. R. (2008). Cognitive neuroscience and schizophrenia: translational research in need of a translator. *Biol Psychiatry, 64*(1), 2-3.

Recommended Reading

Carter, C. S., Barch, D. M., Buchanan, R. W., Bullmore, E., Krystal, J. H., Cohen, J., et al. (2008). Identifying cognitive mechanisms targeted for treatment development in schizophrenia: an overview of the first meeting of the Cognitive Neuroscience Treatment Research to Improve Cognition in Schizophrenia Initiative. *Biol Psychiatry, 64*(1), 4-10.

Clark, D. A., & Beck, A. T. (2010). Cognitive theory and therapy of anxiety and depression: Convergence with neurobiological findings. *Trends Cogn Sci*.

Raedt, R. D., Koster, E. H.W., & Joormann, J. (2010). Attentional control in depression: A translational affective neuroscience approach. *Cogn Affect Behav Neurosci 2010 10:1-7*

Ross, K., Freeman, D., Dunn, G., & Garety, P. (2009). A Randomized Experimental Investigation of Reasoning Training for People With Delusions. *Schizophr Bull*.

Finals Week