

**Human Social Neuroscience**  
ANT 317  
T/Th; 11:30 P.M. – 12:45 P.M.  
205 White Hall

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Office hours: Wednesdays from 1-3 and by appointment, room 304 Anthropology

Content: As primates, we are unusually social mammals. We devote extensive cognitive effort and resources to managing and maintaining social relationships. Indeed, the need to interact skillfully with others may well have been one of the key selective pressures shaping the evolution of human brain and mind. There has been a recent explosion of research aimed at understanding the neurobiological systems that support human social cognition and behavior. This course will review and synthesize this growing body of research coming out of the fields of neuropsychology, psychiatry, neuroimaging and experimental animal research.

This is an upper level, interdisciplinary course that integrates perspectives from anthropology, psychology and neuroscience. A central goal of anthropology is to achieve a better understanding of human social life. Anthropologists are interested, among other things, in learning how human social behavior is similar to and different from the social behavior of other primate species. In this course, we will consider the neural bases of aspects of social behavior and cognition that we share with other primates, as well as aspects that differentiate us from the rest of the primate order. In the process, we will learn about specializations of the human brain that likely evolved in the time since we diverged from our common ancestor with chimpanzees.

Prerequisites: ANT 200/NBB 201, Psych 110 or permission of instructor

**Readings:** Readings will be posted on Blackboard.

**Grading:**

- 1. (50%) Several announced quizzes**
- 2. (10%) Class attendance and participation:** If you attend every class but rarely or never contribute to class discussions, you will receive 5 of 10 possible points.
- 3. (5%) Neuroanatomy (small group and take-home) assignment**
- 4. (10%) 2 Journal club (small group) assignments**
- 5. (25%) Final assignment:** composed of a paper in the form of a research proposal

1. Quizzes: Your quiz grade will be based on your best 4 of 5 quiz scores.

2. Class attendance and participation: If you attend every class but rarely or never contribute to class discussions, you will receive 5 of 10 possible points.

3. Neuroanatomy small group and take-home assignment: Use laptops in class to download and navigate neuroanatomy software and atlases in order to complete assignment.

4. Journal Club Assignment: Throughout the course of the semester, we will have four class periods devoted to “journal club”. On these days, we will discuss academic journal articles in small groups. Your assignment is to choose one of the assigned articles on two of these four days and write a one page summary about it (see Blackboard for more details). These summaries will be due at the beginning of the class period for which the articles will be discussed. Although you will only write about 1 of the articles, you will be expected to read all assigned readings.

5. Research Proposal: Detailed instructions for research proposal preparation are provided on the class Blackboard site.

**Late /missed work**: Assignments that are handed in past their due date, or quizzes that are missed and need to be made up, will only be accepted if it is accompanied by one of the following:

- 1) A doctor’s note verifying an illness that creates an inability to complete the assignment
- 2) A note from an Emory administrative office (such as the Dean’s Office) explaining the circumstances that require you to miss or hand in the assignment on time (for example, a death in the family)
- 3) A note from the IT office at Emory explaining specific technological difficulties that *directly* prevented you from passing in an assignment on time (please note that this is not a guarantee of acceptance, as computers are available for student use at the library and elsewhere on campus)
- 4) Prior arrangement with Dr. Mascaro ***at least two class periods in advance***. This pertains to, among other reasons, religious holidays that overlap with class sessions or exams. This arrangement must be confirmed by Dr. Mascaro; sending an email with no follow-up is not sufficient.

Any assignments turned in past their due date without any of the above approved excuses will be accepted for half (50%) credit ***up to two days*** after the deadline. Any assignments turned in more than two days past their deadline without any of the above approved excuses ***will not be accepted***.

**General advice: Read and keep this syllabus.** It is your permanent guide to the course and your responsibilities. **This is your contract with us, and by staying here you agree to it.** This syllabus is a general plan for the course. Deviations may be necessary in the course of the semester. Changes will be both announced in class and posted on Blackboard. **It is the responsibility of every student to keep informed and be aware of any such changes.**

**\*\*\*HONOR CODE REMINDER\*\*\***

**\*\*An important reminder about the HONOR CODE: *Every student who applies to and is accepted by Emory College, as a condition of acceptance, agrees to abide by the provisions of the Honor Code so long as he or she remains a student at Emory College. By his or her continued attendance at Emory College, a student reaffirms his or her pledge to adhere to the provisions of the Honor Code.***

**Please note: Any appearance of cheating in this class will result in a referral to the Honor Council. Please remember that conviction on an Honor Code violation carries the possible penalty of a notation on the student's Personal Performance Record, meaning that the student will not be accepted to medical, and other professional, schools.**

**Course Outline**

**1) Thurs, Aug. 27: Introduction to the course**

Plan of the course, requirements, and roadmaps

**2) Tues, Sep. 1: Fundamentals of human sociality**

Costs and benefits of social living, sociality and brain evolution, sociality and health.

**Reading:**

Boyd R, and Silk J. 2006. How Humans Evolved. New York: W.W. Norton and Company. 488 p. (Read pages 152-156).

Dunbar RI, and Shultz S. 2007. Evolution in the social brain. Science 317(5843):1344-1347.

**Recommended Reading:**

Cacioppo, J. T. and L. C. Hawkley (2009). "Perceived social isolation and cognition." Trends Cogn Sci **13**(10): 447-454.

**PART 1: FOUNDATIONS**

**3) Thurs, Sep. 3: Brain Basics**

Overview of CNS; macroscopic and microscopic anatomy of cerebral cortex; neurotransmission

**Reading:**

Breedlove SM, Rosenzweig MR, and Watson NV. 2007. Biological Psychology: an Introduction to Behavioral, Cognitive and Clinical Neuroscience. Sunderland, MA: Sinauer Associates. Ch. 2 pp. 23-27, 32-48.

Catani M et al. 2013. Neuroscience and Biobehavioral Reviews. A revised limbic system model for memory, emotion and behavior. 37: 1724-1737. (only highlighted portion)

Recommended Reading:

Nolte J. The Human Brain. Ch. 3

**4) Tues, Sep. 8: FERN fieldtrip: fMRI in action (BE ON TIME PLEASE)**

Imaging the human brain function with Positron Emission Tomography and functional magnetic resonance imaging (fMRI)

Reading:

Breedlove Ch. 2: 51-55

Berkman ET, Cunningham WA, Lieberman MD, Research Methods in Social and Affective Neuroscience. 2013 (only highlighted portion)

**5) Thurs, Sep. 10: Measuring Brain Function**

Imaging the human brain function with Positron Emission Tomography and functional magnetic resonance imaging (fMRI)

Reading:

Review readings from previous class

**6) Tues, Sep. 15: Neuroanatomy small groups**

To get the most benefit, please try to bring your laptop and be willing to share with a neighbor.

**7) Thurs, Sep. 17: Quiz 1**

**PART 2: SOCIAL PERCEPTION**

**8) Tues, Sep. 22: Facial Perception and Evaluation I (Identifying faces)**

Neural systems involved in processing face identity

Reading:

Haxby, J. V., E. A. Hoffman, et al. 2011. Distribute Neural Systems for Face Perception in *Oxford Handbook of face perception*.

**9) Thurs, Sep. 24: Facial Perception and Evaluation II (Processing facial expressions)**

Neural systems involved in processing facial expressions

Reading:

Adolphs R (2010): What does the amygdala contribute to social cognition.  
*Ann. N.Y. Acad. Sci* 1191.

Recommended Reading:

Ballew CC, 2nd, and Todorov A. 2007. Predicting political elections from rapid and

unreflective face judgments. *Proc Natl Acad Sci U S A* 104(46):17948-17953.

Kirsch, P., C. Esslinger, et al. (2005). "Oxytocin modulates neural circuitry for social cognition and fear in humans." *J Neurosci* 25(49): 11489-11493.

Guastella, A.J., Mitchell, P.B., and Dadds, M.R. (2008). Oxytocin increases gaze to the eye region of human faces. *Biol Psychiatry* 63, 3-5.

Domes, G., Heinrichs, M., Michel, A., Berger, C., and Herpertz, S.C. (2007). Oxytocin improves "mind-reading" in humans. *Biol Psychiatry* 61, 731-733.

### **10) Tues, Sep. 29: Facial Perception and Evaluation III (Processing facial attractiveness)**

#### Reading:

Bzdok D, et al. (2011). "ALE meta-analysis on facial judgments of trustworthiness and attractiveness." *Brain Struct Funct* 215: 209-223.

#### Recommended Reading:

Winston JS, O'Doherty J, Kilner JM, Perrett DI, and Dolan RJ. 2007. Brain systems for assessing facial attractiveness. *Neuropsychologia* 45(1):195-206.

Todorov A. (2008). "Evaluating faces on trustworthiness." *Ann. N.Y. Acad* 1124(1).

### **11) Thurs, Oct. 1: Quiz 2**

## **PART 3: SOCIAL UNDERSTANDING**

### **12) Tues, Oct. 6: Understanding Others I (understanding others' actions and intentions)**

#### Reading:

Kilner JM and Lemon RN. 2013. What we know currently about mirror neurons. *Current Biology*.

#### Recommended Reading:

Rizzolatti G, and Fogassi L. 2013. Mirror neurons and social cognition. Dunbar RIM, and Barrett L, editors. *The Oxford Handbook of Evolutionary Psychology*. Oxford: Oxford University Press. p 179-196.

### **13) Thurs, Oct. 8: Journal Club #1 - Understanding Others II (understanding others' feelings)**

The neural correlates of empathy

#### Reading:

Singer T, Seymour B, O'Doherty J, Kaube H, Dolan RJ, Frith CD (2004): Empathy for pain involves the affective but not sensory components of pain. *Science* 303:1157-1162.

Singer T, Seymour B, O'Doherty JP, Stephan KE, Dolan RJ, Frith CD (2006): Empathic neural responses are modulated by the perceived fairness of others. *Nature* 439:466-469.

Recommended reading:

Hein G, and Singer T. 2008. I feel how you feel but not always: the empathic brain and its modulation. *Curr Opin Neurobiol*.

Hein, G., Silani, G., Preuschoff, K., Batson, C.D., and Singer, T. (2010). Neural responses to ingroup and outgroup members' suffering predict individual differences in costly helping. *Neuron* 68, 149-160.

Craig AD. 2004. Human feelings: why are some more aware than others? *Trends Cogn Sci* 8(6):239-241.

**Fall Break: Oct 12-13**

**14) Thurs, Oct. 15: Understanding Others III (understanding others' thoughts and beliefs)**

The neural correlates of mentalizing and mind-reading

Reading:

Amodio DM, and Frith CD. 2006. Meeting of minds: the medial frontal cortex and social cognition. *Nat Rev Neurosci* 7(4):268-277.

Zaki J et al. (2009). "The neural bases of empathic accuracy." *PNAS* **106**(27): 11382-11387.

Recommended Reading:

Buckner RL, and Carroll DC. 2007. Self-projection and the brain. *Trends Cogn Sci* 11(2):49-57.

Mitchell JP, Macrae CN, and Banaji MR. 2006. Dissociable medial prefrontal contributions to judgments of similar and dissimilar others. *Neuron* 50(4):655-663.

Chiao, J.Y., Harada, T., Komeda, H., Li, Z., Mano, Y., Saito, D., Parrish, T.B., Sadato, N., and Iidaka, T. (2009). Neural basis of individualistic and collectivistic views of self. *Hum Brain Mapp* 30, 2813-2820.

**15) Tues, Oct. 20: Quiz 3**

**PART 4: SOCIAL INTERACTION**

**16) Thurs, Oct 22: Journal Club #2: Parental Love**

Reading:

Kim, P., et al. (2010) The plasticity of human maternal brain: longitudinal changes in brain anatomy during the early postpartum period. *Behavioral Neuroscience* 124, 695-700.

Mascaro, J. et al. (2013) Behavioral and genetic correlates of the neural response to infant crying among human fathers. *SCAN*.

Recommended Reading:

Rilling J (2013). "The neural and hormonal bases of human parental care." *Neuropsychologia* **51**: 731-747.

Strathearn, L., P. Fonagy, et al. (2009) "Adult attachment predicts maternal brain and oxytocin response to infant cues." *Neuropsychopharmacology* **34**(13): 2655-2666.

**17) Tues, Oct. 27: Romantic Love and Jealousy**

Readings:

Bartels A, Zeki S (2004): The neural correlates of maternal and romantic love. *Neuroimage* 21:1155-1166.

Recommended Reading:

McGraw LA and Young L (2009) The prairie vole: an emerging model organism for understanding the social brain. *Trends in Neurosciences*.

**18) Thurs, Oct. 29: Journal Club #3 - Cooperation, Altruism and Compassion**

Reciprocal Altruism (trust, reward, guilt/empathy)

Reading:

Moll, J. (2006) Human fronto–mesolimbic networks guide decisions about charitable donation. *PNAS*.

De Dreu, C. K., L. L. Greer, et al. (2010). "The neuropeptide oxytocin regulates parochial altruism in intergroup conflict among humans." *Science* **328**(5984): 1408-1411.

Recommended Reading:

Chapter 1 in Hrdy, S. B. (2009). *Mothers and Others*. Cambridge, Massachusetts, Harvard University Press.

Baumgartner T, Heinrichs M, Vonlanthen A, Fischbacher U, and Fehr E. 2008. Oxytocin shapes the neural circuitry of trust and trust adaptation in humans. *Neuron* 58(4):639-650.

**19) Tues, Nov. 3: Journal Club #4: Revenge, Punishment and Social Exclusion**

Reading:

de Quervain, D. J., U. Fischbacher, et al. (2004). "The neural basis of altruistic punishment." *Science* **305**(5688): 1254-1258.

Eisenberger NI, Lieberman MD, Williams KD (2003): Does rejection hurt? An fMRI study of social exclusion. *Science* 302:290-292.

Recommended Reading:

Singer, T., B. Seymour, et al. (2006). "Empathic neural responses are modulated by the perceived fairness of others." *Nature* **439**(7075): 466-469.

Cacioppo, J. T. and L. C. Hawkley (2009). "Perceived social isolation and cognition." *Trends Cogn Sci* **13**(10): 447-454.

Dewall, C. N., G. Macdonald, et al. (2010). "Acetaminophen reduces social pain: behavioral and neural evidence." *Psychol Sci* **21**(7): 931-937.

**20) Thurs, Nov. 5: Conformity and Norm-abiding social behavior**

Reading:

J.D. Greene (2014). *The Cognitive Neuroscience of Moral Judgment and Decision Making*. Decety, J. and Wheatley, T. Eds. *The Moral Brain: A Multidisciplinary Perspective*, MIT Press.

**21) Tues, Nov. 10: Quiz 4**

**PART 5: SOCIAL BEHAVIORAL DISORDERS**

**22) Thurs, Nov. 12: Development of the "social brain"**

Readings:

Crone EA and Dahl RE (2012) Understanding adolescence as a period of social–affective engagement and goal flexibility. *Nature Reviews Neuroscience*

Recommended readings:

Pfeifer JH and Blakemore SJ (2012) Adolescent social cognitive and affective neuroscience: past, present, and future. *SCAN*

**23) Tues, Nov. 17: Deficits of empathy: Autism**

Reading:

Levy, S.E., Mandell, D.S., and Schultz, R.T. (2009). Autism. *Lancet* **374**, 1627-1638.

Andari, E., Duhamel, J.R., Zalla, T., Herbrecht, E., Leboyer, M., and Sirigu, A. (2010). Promoting social behavior with oxytocin in high-functioning autism spectrum disorders. *Proc Natl Acad Sci U S A* **107**, 4389-4394.

**24) Thurs, Nov. 19: Deficits of empathy: Psychopathy**



Reading:

Glenn, A. L. and A. Raine (2009). "Psychopathy and instrumental aggression: Evolutionary, neurobiological, and legal perspectives." International journal of law and psychiatry Am **32**(4): 253-258.

Blair, RJR (2013) The neurobiology of psychopathic traits in youths. Nature Reviews Neuroscience.

**25) Tues, Nov. 24: William's Syndrome**

Reading:

NY Times article on Williams Syndrome and the Brain:  
[http://www.nytimes.com/2007/07/08/magazine/08sociability-t.html?\\_r=1&pagewanted=1&fta=y&oref=slogin](http://www.nytimes.com/2007/07/08/magazine/08sociability-t.html?_r=1&pagewanted=1&fta=y&oref=slogin)

Recommend Reading:

Jackowski, A. P., K. Rando, et al. (2009). "Brain abnormalities in Williams syndrome: a review of structural and functional magnetic resonance imaging findings." Eur J Paediatr Neurol **13**(4): 305-316.

Meyer-Lindenberg, A., C. B. Mervis, et al. (2006). "Neural mechanisms in Williams syndrome: a unique window to genetic influences on cognition and behaviour." Nat Rev Neurosci **7**(5): 380-393.

**Thanksgiving break: Nov. 26 – 27**

**26) Tues, Dec. 1: Borderline Personality Disorder**

Reading:

King-Casas, B., C. Sharp, et al. (2008). "The rupture and repair of cooperation in borderline personality disorder." Science **321**(5890): 806-810.

Recommend Reading:

Domes, G., L. Schulze, et al. (2009). "Emotion recognition in borderline personality disorder-a review of the literature." J Pers Disord **23**(1): 6-19.

**27) Thurs., Dec. 3: Overflow and review**

**28) Tues, Dec. 8: Quiz 5**

**\*\*\*Thursday, Dec 10th 3:00: FINAL PAPER DUE \*\*\***