

Introduction to Social Neuroscience

BIOS 14116
TTh 12:30-1:50PM
Room: BSLC 008

INSTRUCTOR:

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ACKNOWLEDGEMENT:

This course is dedicated to
Professor Dr. John T. Cacioppo,
founder of the field of social neuroscience.

NO RECORDINGS: Because copyrighted material will be presented, **no** recordings of the class are authorized.

COURSE DESCRIPTION: Previously known as BIOS 14115, this course on social neuroscience addresses a timely topic in the fields of medicine, psychology, and the neurosciences. Specifically, a key challenge in the study of the brain and its effects on health and behavior resides not only in determining how one's mental states and processes map onto their own patterns of brain activity but also how this activity is modulated by shared representations with other individuals through various neural, hormonal, cellular, and genetic mechanisms. These are questions that fall within the field of social neuroscience – the study of the neural, hormonal, cellular, and genetic mechanisms underlying the super-organismal structures and processes that define social species. When social neuroscience was first proposed a quarter century ago, attention had to be given to address why the notion of a “social neuroscience” was *not* an oxymoron and to articulate a set of principles (the doctrine of multilevel analysis) that justified attention to super- organismal structures (e.g., a pair bond, marriage, salutary relationship) in the analysis of the function of the nervous system

and brain. This was prior to the recognition of the importance of epigenetics and prior to the sophisticated means of probing the neurobiology of the social self, embodied cognition, and the social brain dynamics in normal, waking humans and animals that exist today. Indeed, genes were still thought to be strong if not invariant determinants of human illness, phenotypes and behavior. So where does social neuroscience now fit within medicine and the science of brain, mind, and behavior? That is the focus of the course.

Syllabus, reading materials, study guides, assignment guidelines, and general course announcements will be posted on Canvas.

COURSE OBJECTIVES: *By the end of the quarter, students should be able to:*

1. Explain the multi-level and interdisciplinary approach of social neuroscience.
2. Describe experimental and other methodological approaches designed to address questions in social neuroscience and discuss the strengths and limitations associated with those approaches.
3. Describe the mechanisms by which neuronal circuits are modulated by social connections/disconnections.
4. Compare and contrast the neurobiological underpinnings of 'physiological' versus 'pathological' emotional and cognitive behaviors.
5. Critically evaluate clinically relevant neurological cases to develop insights into medical neuroscience.
6. Explain where social neuroscience fits within medicine and the other Core Concepts first introduced in Core Biology.
7. Describe societal applications and implications of social neuroscience.

WEEKLY SCHEDULE:

1. Tuesday: Week 1 is orientation week. Starting Week 2, the instructor will give a lecture, placing the week's readings within a broader theoretical context, and lead a discussion. You are expected to have **completed the readings** by Tuesday's lecture. The reading load is relatively light so that you can reflect on the week's readings in your written assignment and class discussion.
2. Thursday:
 - a. Your **written discussion question** for the week is due by noon on Canvas.
 - b. Starting Week 3, Lecture + research slide illustrating the week's lecture. One small group of students will **present research slides** that summarize and discusses the assigned readings for that week. The slides present a question that has been inspired by the week's readings and the *news* of that week. The goal is to understand that every big question in Society is related to social behaviors and social neuroscience.
3. Friday: Starting Week 3, a **quiz** based on the week's topics will be posted on Canvas. It is due by noon the following Tuesday.

GRADING SCALE

93-100% A	87-89.9% B+	77-79.9% C+	67-69.9% D+
90-92.9% A-	83-86.9% B	73-76.9% C	60-66.9% D
	80-82.9% B-	70-72.9% C-	<60% F

GRADING BREAKDOWN

Weekly Discussion Question (40%)

Attendance (25%)

Weekly Canvas Quizzes (35%)

WEEKLY DISCUSSION QUESTION (40%)

By Thursday at noon each week, submit your written discussion question on Canvas. Submissions must be in a .doc or .docx file. Provide citations for any scientific evidence you call upon. Citations in your paragraph should include the author's last name and the year of publication (e.g. Gazzaniga, 1989).

In ~1 double-spaced page, address the following (**2 points each**):

1. Summarize your reading(s) of the week in a paragraph
Ex) **"In this week's reading(s), I've learned..."**
2. Highlight the current gap in the literature in a paragraph
Ex) **"What remains unclear to me..."**
3. State your question in a paragraph
Ex) **"I, thus, wonder..."**
4. Summarize the empirical basis for your question drawing on the week's assigned readings in a paragraph
Ex) **"Despite [PUT AUTHOR'S NAME HERE]'s findings showing that x, y, z, ...etc., the author/s did not address my question..."**
5. In one paragraph, then explain why your question is *scientifically* important. Give the best answer you can based on logic and available scientific evidence. If there is evidence on more than one side of an issue, give the conflicting arguments and evidence. Your answer should include points from one or more assigned readings.
6. In one paragraph, explain why your question is important for *Society*. Provide scientific citations for this evidence as appropriate. Your answer should include points from one or more assigned readings.

Full credit of 12 points is given for work reflecting an overarching understanding and integration of all of the week's readings, critically evaluating the existing studies, and providing original and insightful ideas based on logically and scientifically driven argument.

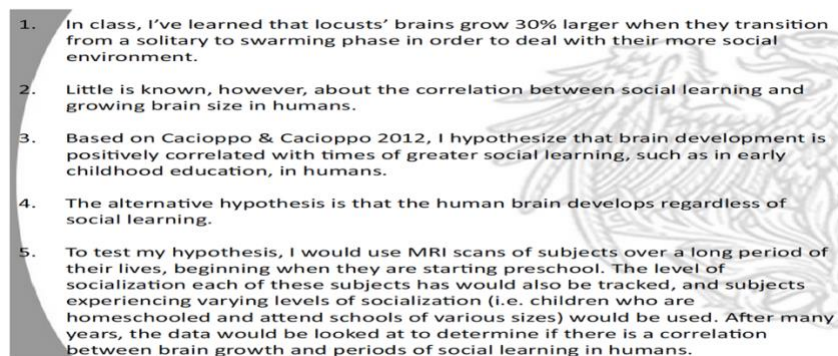
Papers that are submitted after Thursday noon will be docked one point each day. Papers that are never returned = 0.

CONTRIBUTION TO CLASS DISCUSSION (25%)

You will be responsible for presenting one research slide in class during the Spring Quarter. Please sign up for slots during the first week. See TAs for details. If you do not

find a date of presentation that fits your schedule, please email one of your TAs ASAP to re-schedule to a date that best fits your schedule. Once you know and agree with the date of your presentation, you will be asked to prepare a research slide on one of the topics that has been addressed in class. You can select your topic of interest. Your research slide should include the following points:

1. **Section 1: “In class, I’ve learned...”** (one sentence)
 2. **Section 2: “Little is known, however, about...”** (one sentence)
 3. **Section 3: “Based on (CITE A SCIENTIFIC PAPER), I hypothesize that...”** (one sentence)
 4. **Section 4: “The alternative hypothesis is that...”** (one sentence)
 5. **Section 5: “To test my hypothesis, I would...”** (one paragraph)
- Be sure to cite research methods, population of interest, sample sizes, and statistical analyses (e.g. mean comparison, correlation, etc.)



The day before your presentation, please submit your slide on Canvas. The day of your presentation, the instructor (or the TA) will give you access to a laptop where your slide will be uploaded. You will have ten (10) minutes to present your research slide in class. Your research slide presentation will be graded on a 10-point scale (1 point per section for section 1-4; 4 points for section 5; 2 points for oral presentation). Each point will be graded as follows:

- Sections 1-4:
 - Missing (or empty) point: 0
 - Section grounded in belief, opinion, or personal experience rather than sufficient empirical (i.e., scientific) evidence from the readings = 0.5
 - Section sufficiently grounded in scientific evidence = 1
- Section 5:
 - Missing (or empty) section: 0
 - Section grounded in belief, opinion, or personal experience rather than empirical (i.e., scientific) evidence from the readings = 0.5
 - Section well-grounded in scientific evidence = 3
 - Section reflecting an overarching understanding and integration of the research methods addressed in class = 4.
- Overall presentation should go beyond the text on the slide to convey a deep understanding of the work, critically evaluate the existing studies, and provide original and insightful ideas based on logically and scientifically driven arguments.

Feel free to email your TAs with questions about the presentation assignment.

WEEKLY CANVAS QUIZZES (35%)

Starting Week 3, on Fridays, a quiz will be posted on Canvas focused on the topics of the past week. The questions are multiple choice, matching, fill-in-the-blank, etc. You may consult your notes; however, you must **not** work with others. Once you start the quiz, you will have 20 minutes to complete it. Each quiz must be completed by noon the following Tuesday. It is in your best interest to prepare ahead of time for each quiz as you may not have enough time during the quiz to consult your notes. **Under no circumstances will extensions on the quiz deadlines be given.**

PASS/FAIL OPTION: You may request to take this course Pass/Fail. However, this request must be made in writing **prior** to taking the third (3rd) quiz. Keep in mind that if you are taking this course to satisfy a general education requirement in the biological sciences, you must take this course for a quality grade. Under the P/F option, a grade of C or better is required to get a passing (P) grade. Grades below a C will be assigned an F.

COURSE WITHDRAWAL: You have until the end of third (3rd) week to drop this course from your schedule. After the 3rd week, you can request to withdrawal from the course and receive a W on your transcript. You must officially make this request by emailing the instructor; otherwise, you will be given the grade you earned. This request must be made **prior** to taking the third exam during finals week.

ACADEMIC HONESTY: Academic dishonesty is not tolerated by the University of Chicago and will not be tolerated in this course. All of the work you submit is expected to be in your own words with appropriate attribution to your sources of information. You must also complete all quizzes on your own, without consulting classmates, the TA, students not in the course, etc. A demonstrated case of academic dishonesty will result in a loss of credit and a report submitted to the Master of the Biological Sciences Collegiate Division and the Dean of Students office, at which point additional grading deductions and disciplinary measures may be taken. Please read all of the guidelines in your student manual regarding academic honesty and contact the instructor if you have any questions.

Week	Date	Agenda	Assigned Readings
Week 1	March 27	Class Orientation	
	WEDNESDAY March 28 @6pm	Memorial at the Rockefeller Chapel	Wednesday's Memorial replaces Thursday's class this week
Week 2	April 3 April 5	<i>What is social neuroscience?</i> The Social Brain of the Desert Locust Neuroscience and Social Neuroscience Doctrine of MultiLevel Analysis	Cacioppo, J. T., & Berntson, G (1992). Social psychological contributions to the decade of the brain: doctrine of multilevel analysis. <i>American Psychologist</i> , 47, 1019-1028. Cacioppo, J. T. & Cacioppo, S. (2013) Social Neuroscience. <i>Perspectives on Psychological Science</i> , 8, 667-669.
	April 10 April 12	<i>Social connections matter</i> Objective and Perceived Social Isolation (Loneliness) Measuring social isolation The Cacioppo Evolutionary theory of loneliness Loneliness and the Brain	Cacioppo, S., Capitanio, J. P., & Cacioppo, J. T. (2014). Toward a neurology of loneliness. <i>Psychological Bulletin</i> , 140, 1464-1504. Cacioppo, J.T., Cacioppo, S., Capitanio, J. P., & Cole, S. W. (2014, Aug 22). The neuroendocrinology of social isolation. <i>Annual Review of Psychology</i> , 66.
Week 4	April 17 April 19	The Social Brain Methods for studying the social brain Evolution of the Social Brain Social Intelligence Social Learning Culture	Cacioppo, S., Frum C., Asp E., Weiss R. M., Lewis J. W., Cacioppo, J. T. (2013) A quantitative meta-analysis of functional imaging studies of social rejection. <i>Scientific Reports, Nature Communications</i> , 3, 2027. Dunbar, R. I. M. (2003). Evolution of the Social Brain. <i>Science</i> , 1160-1161. Herrmann E. et al. (2007). Humans Have Evolved Specialized Skills of Social Cognition: The Cultural Intelligence Hypothesis. <i>Science</i> , 1360- 1366.

Week 5	April 24 April 26	Connecting Forces Emotional contagion Empathy Mentalizing	Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1993). Emotional contagion. <i>Current Directions in Psychological Science</i> , 2, 96-99. Cacioppo, S., & Cacioppo, J. T. (2012). Decoding the invisible forces of social connections. <i>Frontiers in Integrative Neuroscience</i> , 6, 51. Doi: 10.3389/fnint.2012.00051
Week 6	May 1 May 3	Social Perception: Reading the face	Prochnow et al., (2013) The neural correlates of affect reading: An fMRI study on faces and gestures. <i>Behavioral Brain Research</i> , 237, 270-277 Decety, J. & Cacioppo, S. (2012). The speed of morality: a high-density electrical neuroimaging study. <i>Journal of Neurophysiology</i> , 108, 3068-72.
Week 7	May 8 May 10	Social Deception: Reading the eyes	Baron-Cohen, et al. (2015). Reading the mind in the eyes-test. Plos One. 10:30136521 Bolmont, M., Cacioppo, J. T., Cacioppo, S. (2014) Love is in the gaze. <i>Psychol. Sci.</i> 25: 1748-1756
Week 8	May 15 May 17	Group processes and social influence Reciprocity Prejudice and Stereotype Altruism Persuasion	Cacioppo, J. T., Cacioppo, S., Petty, R. (2018). The neuroscience of persuasion. <i>Soc. Neuroscience</i> , 13: 129-172.
Week 9	May 22 May 24	Salutary social connections From me to we Health benefits of love Cognitive benefits of love	<i>Cacioppo, S. Neural markers of interpersonal attraction.</i> http://emotionresearcher.com/neural-markers-of-interpersonal-attraction-a-possible-new-direction-for-couples-therapy/
Week 10	May 29	General Discussion	
	June 31	College Reading Period: No Class	