

PSYD17: Social Neuroscience
Winter Term, 2019
Mondays 1-3PM, Highland Hall 010

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Course Description

This course will ask two deceptively simple questions: 1) Can an understanding of the physical architecture of our brains and bodies tell us something about our social minds? 2) Can we (and should we?!) apply this knowledge to make better decisions about our social world? We will explore cutting-edge social neuroscience questions, and consider their contributions to important debates about physical and mental health, emotions, personality, morality, love, and human nature.

Course Learning Objectives

After completing this course, you should have gained:

1. Mastery of key concepts, theories, and cutting-edge questions in social neuroscience, including the hypothesized functions of relevant brain areas, and the use of those brain regions for making inferences about social psychological processes
2. Ability to critically interpret writing that draws on social neuroscience, including sources from empirical journals, books, and the popular press
3. Ability to identify testable hypotheses underlying important questions or arguments, and to locate evidence that supports or refutes that hypothesis
4. Ability to generate methods for testing those hypotheses
5. Practice expressing yourself in an argumentative style through both oral and written forms
6. Experience collaborating with others in the service of larger projects

Readings

There is no textbook for this course. Readings will consist of empirical journal articles, reviews and book chapters, as well as popular press articles. Part of the objectives for the course are to teach you how to read, extract information from, and critique primary-source articles. All reading materials can be found as a list at the end of this syllabus and on Quercus. The instructor reserves the right to alter readings during the semester, with sufficient notice, based on judgments about appropriateness, fit, and relevance as the course progresses.

Class Meetings

The class meets once weekly, from 1-3PM in Highland Hall, Rm. 010. Classes will consist of a mix of:

1. Mini-lectures given by Professor Hutcherson, introducing a particular topic and providing relevant background information for the class.
2. Skill-building tutorials designed to give students knowledge and understanding of critical concepts, as well as expectations that must be met to complete course assignments (and, more broadly, to succeed in both professional and interpersonal contexts).
3. Mock trial debates (6 weeks), led by student teams, considering different sides of key issues in social neuroscience.
4. Full-class discussions and analysis of critical questions and ideas in social neuroscience (6 weeks).

Attendance in class is mandatory, and all students are expected to come to class fully prepared to engage in discussion, regardless of whether they are specifically leading a class debate, or are contributing as an involved spectator.

Grading

Participation	25%
In-Class	(15%)
Submitted Questions	(10%)
Class Presentation	30%
Writing Assignment	45%

Description of grade components:

1. Class participation (25%)
Learning Objectives 1-5

This class is a small seminar-style course, oriented around group discussion and critical analysis of ideas, concepts, and theories in social neuroscience. As such, a crucial aspect of the class depends on your contributions of questions, clarifications, ideas, and critiques. As the instructor for the course, I will work to facilitate conversations and provide input and guidance, but unlike a lecture class, **the quality of this course and what you get out of it depends in large part on YOU and your fellow classmates.**

For this reason, a portion of your grade is determined by your active participation in class. Participation will be graded based on the following two components:

- a. Weekly submission (in weeks 2-12) of **two factual/clarification questions (1 pt. each) as well as two thoughtful discussion questions (2 pts. each), based on the weekly required readings.** Submission of these questions will constitute 40% of your participation grade (i.e., 10% of your course grade), and must be completed by the Friday prior to class at 5pm sharp. Questions should be uploaded as a word or

PDF document to Quercus by the due date. You may have one “freebie” week in which you do not need to submit questions, meaning that you must submit questions for 10 weeks in order to receive full credit. Late submissions will not be graded.

Note that these two types of question are designed to get you to think about the readings in different ways:

First, *factual/clarification questions* are designed to get you thinking about which aspects of the article you did not understand from a technical, conceptual, or methodological perspective. Often times, and especially with neuroscience studies, students may feel confused about these aspects of a paper but assume that they *ought to know* these things, that it's *okay if they don't know* them, or that they are the *only one* who does not know. Unfortunately, all of these assumptions can impede actual learning! Thus, each week, I am asking you to identify two things you did not understand (or are not sure you understand) from that week's articles. This could involve essentially any aspect of the article, including not understanding terminology or references to other literatures, not understanding statistical or methodological aspects of an article, not understanding why certain study design choices were made, not understanding the link between some result and some interpretation, etc. Do not worry about sounding stupid or asking questions that you think other people wouldn't need to ask! Factual/clarification questions are expressly designed to help both you and me identify gaps in your knowledge so that we can address them head on. Based on the questions you and your fellow students submit, I will either address some of these questions for everyone in the class, or individually with each of you, as appropriate. Some of these questions, along with their answers, may also be posted on Quercus (minus student identifiers) as a kind of FAQ page. My hope is that identifying these gaps will be one way in which we can tailor the course to each of you and your own learning objectives. These two questions will simply be graded based on being submitted/not submitted in good faith. Note, however, that I reserve the right to reject a submitted factual/clarification question if I feel that it is not being submitted in good faith (e.g., “making up” a point of confusion/clarification just for purposes of submitting a question).

The second type of question you must submit are *thoughtful discussion questions*. Here, the aim is a bit different from clarifying facts and understanding. Instead, the goal is to think critically about the ideas or facts being presented in a given paper, to think creatively about how to interpret or explain specific findings, and/or to link those findings to other important and relevant ideas or areas. These questions should be expressly designed *to inspire and provoke discussion*. Generating a successful discussion question is not a trivial matter, and thus discussion questions will be graded not only on submission but on the quality of the question generated.

What makes for a high-quality discussion question? A good discussion question consists of three interrelated components†: 1) It should contain an interesting or thought-provoking idea or critique that goes beyond a mere factual reading of an article, and either complicates interpretation of results, or extends those results in novel directions not expressly contained in the original paper; 2) It should contain a principled justification of the idea or critique based on sound argumentation and/or

presentation of relevant facts (which can be derived either from within the paper itself, or from reference to other materials, as appropriate). It is not enough simply to say “I wonder if...” You must justify *why* your idea is sensible and appropriate; 3) The question should demonstrate innovative thinking that can lead to other testable hypotheses or ideas.

Grading of discussion questions will use the following grading scheme:

<i>Score</i>	<i>Description</i>
0	No discussion questions submitted; too few were submitted; late submission.
1-1.25	Idea/critique and justification is provided, but it is weak or superficial. Does not go significantly beyond the presented facts.
1.5	Idea/critique and justification are appropriate, but innovation is relatively weak.
1.75-2	Ideas/critiques are appropriate, and innovative potential is clear and substantial. Note: A question must be quite strong to earn the full 2 points.

† These criteria are based off of similar ideas developed by Professor Michael Souza. They are excellent and clear criteria, so I am borrowing them shamelessly here.

- b. In-class participation. This course consists of 12 weekly meetings where we will discuss and debate papers, ask questions, and explore ideas both ancient and modern. Since the quality of this discussion depends so heavily on you, **you will be required to contribute to each and every class discussion in some way**. Weekly participation constitutes 60% of your total participation grade (i.e., 15% of your overall course grade). I recognize that some students may be more reticent about oral expression than others, but the goal here is to make a safe space for everyone to regularly contribute, and for you to develop comfort in expressing your ideas, responding to questions from others, and thinking on your feet. Students will be graded on their participation each week using the following scheme:

0	Student is late, did not participate, or has an unexcused absence from class.
1	Student contributed once in class; contribution was relatively minor or superficial.
1.25-1.5	Student contributed more than once, and demonstrated partial evidence of knowledge of the material, critical thinking and/or engagement with material
1.75-2.0	Student contributed more than once and demonstrated substantial evidence of knowledge of the material, high-level critical thinking and/or engagement with the material.

Note: While there are 12 weeks of class, you will automatically receive full points for your participation in the week of class where you present (assuming you attend class and contribute to your group presentation).

2. Class Presentation (30%)
Learning Objectives 1, 5, 6

In six (6) of the 12 weeks of this class, we will engage in a trial-style debate centered on a particular question of interest, which can be addressed by a combination of psychological and neurobiological evidence. Each of these six debates will be led by two teams of 1-2 students per team (i.e., 3-4 students total) and will follow the format below:

- a. Arguments for side 1 (8-10 minutes)
- b. Arguments for side 2 (8-10 minutes)
- c. Small-group discussion
- d. Rebuttal side 1 (1-2 minutes)
- e. Rebuttal side 2 (1-2 minutes)
- f. Full class discussion and synthesis of ideas (30-40 minutes).

Arguments for Side 1/2: Each team will be responsible for presenting arguments for one side of the debate. Teams will be assigned materials consisting of 2-3 articles (over and above the required readings) that are relevant to one or both sides of the debate, and will be expected to construct an 8-10-minute presentation that lays out the evidence for their “side” of the argument. This argument should consist of: 1) summaries of key results or ideas from the assigned papers; 2) consideration of how those key points support the team’s argument; 3) extra research findings beyond the assigned articles that are identified as relevant to the debate, along with justification of their relevance.

Rebuttals for Side 1/2: Following presentation of the main arguments, there will be a 5-10 minute discussion period, during which the teams themselves, as well as small groups consisting of other members the class as a whole, will have a chance to discuss in small groups the arguments laid out, identifying important outstanding questions and themes, and formulating a response. Each team will then have 1-2 minutes to marshal any pertinent evidence that they believe might help to bolster their side of the debate. Teams are encouraged to anticipate some of these arguments when they are constructing their presentations, in order to help them prepare for the rebuttal period.

Full class discussion and synthesis of ideas: Following presentation of arguments and rebuttals, the two teams will then be responsible for jointly leading the class in discussion and consideration of the arguments, as well as other pertinent questions that arise. During this period, the non-presenting students in the class will serve as judge and jury, posing questions to the teams as well as to the class as a whole that might help to resolve or illuminate the debate. Note that, in order to effectively participate in this component of the class, all students will need to have read the mandatory class readings, while the presenting teams will need to be familiar enough with their assigned readings to answer questions posed by the class.

Teams will be graded on the quality and depth of their presentations. Individual students will be graded on their evident contribution to the team performance, as well as by feedback to Prof. Hutcherson from each team member regarding their own and their partners’ contributions to the final presentation. For this reason, contributions from each member of the team should be discussed and agreed upon by as they prepare their presentations.

Informal “winners” of the debate will also be determined for each debate week based on polling of the class prior to and following presentation of the arguments and class discussion. The winners of each debate will receive 1% extra credit toward their course grade. To account for the fact that some arguments may be inherently easier to make than others, winners will be determined not by the final portion of students agreeing with a particular side of the debate, but by the *shift* in agreement toward a given side from pre- to post-class.

We will spend a portion of the first and second classes reviewing expectations for this component of the class, and additional materials regarding grading and rubrics will be provided on Quercus to help you in preparing your presentations.

3. Writing Assignment (45%)
Learning Objectives 1-5

The final component of this class consists of a written 5-6 page essay in the style of an opinion editorial for a popular media newspaper or magazine. This essay is designed to hone your argumentation and writing skills, including 1) construction of a cogent, interesting, and *falsifiable* thesis; 2) identification and use of relevant research to support the thesis; 3) identification and use of relevant research that contradicts the thesis (i.e., the counterargument), as well as consideration of any evidence that might refute the counterargument; 4) critical analysis of research and ideas; and 5) concise, efficient and elegant use of language. Students will have their choice of a range of essay topics, which will be described in further detail by assignment materials made available on Quercus. The paper will involve a number of intermediate steps, due over the course of the semester, including:

- a. Identification of research topic
- b. Annotated bibliography, statement of thesis, and essay outline
- c. Rough draft of the paper
- d. Review and critique of fellow students’ papers
- e. Response to reviews and final draft of the paper

As with the class presentation, we will spend a portion of class in weeks 3, 4, 6 and 9 reviewing expectations for this component of the class, and additional materials regarding grading and rubrics will be provided on Quercus to help you in preparing your essay.

Missed Term Work due to Medical Illness or Other Emergency

All students citing a documented reason for missed term work must submit their request for accommodations **within three (3) business days** of the deadline for the missed work.

Students must submit **BOTH** of the following:

1. A completed **Request for Missed Term Work Accommodations form** (<http://uoft.me/PSY-MTW>), and
2. **Appropriate documentation** to verify your illness or emergency, as described below.

Appropriate documentation:

For missed **ASSIGNMENTS** due to **ILLNESS**:

- Submit the Request for Missed Term Work Accommodations form (<http://uoft.me/PSY-MTW>), along with a **hardcopy** of the Self-Declaration of Student Illness Form (uoft.me/PSY-self-declare-form).

For missed assignments in **OTHER CIRCUMSTANCES**: Submit the Request for Missed Term Work Accommodations form (<http://uoft.me/PSY-MTW>), along with:

- In the case of a **death of a family member or friend**, please provide a copy of a death certificate.
- In the case of a **disability-related concern**, if your desired accommodation is within the scope of your Accommodation Letter, please attach a copy of your letter. If your desired accommodation is outside the scope of your Accommodation Letter (ex. if your letter says “extensions of up to 7 days” but you need more time than that) you will need to meet with your consultant at AccessAbility Services and have them email Keely Hicks (keely.hicks@utoronto.ca) detailing the accommodations required.
- For U of T Varsity **athletic commitments**, an email from your coach or varsity administrator should be sent directly to Keely Hicks (keely.hicks@utoronto.ca) **well in advance** of the missed work, detailing the dates and nature of the commitment.
- For **religious accommodations**, please email (keely.hicks@utoronto.ca) **well in advance** of the missed work.

Documents covering the following situations are NOT acceptable: medical prescriptions, personal travel, weddings/personal/work commitments.

Procedure:

Submit your (1.) [request form](#) and (2.) [medical/self-declaration](#)/other documents in person **WITHIN 3 BUSINESS DAYS** of the missed term test or assignment.

Submit to: Keely Hicks, Room SW420B, Monday – Friday, 9 AM – 4 PM

Exceptions to the documentation deadline will only be made under exceptional circumstances. If you are unable to meet this deadline, you must email Keely Hicks (keely.hicks@utoronto.ca) **within the three business day window** to explain when you will be able to bring your documents in person. Attach scans of your documentation.

Within approximately one week, you will receive an email response from your instructor detailing the accommodations to be made (if any). **You are responsible for checking your official U of T email and Quercus course announcements daily, as accommodations may be time-critical.**

Completion of this form does NOT guarantee that accommodations will be made. The course instructor reserves the right to decide what accommodations (if any) will be made. Failure to adhere to any aspect of this policy may result in a denial of your request for accommodation.

Instructors cannot accept term work after April 12, 2019. Beyond this date, you would need to file a petition with the Registrar's Office to have your term work accepted (<https://www.utsc.utoronto.ca/registrar/term-work>).

Note that this policy applies only to missed assignments and term tests. Missed final exams are handled by the Registrar's Office (<http://www.utsc.utoronto.ca/registrar/missing-examination>).

Quercus

The course's Quercus website is the central location where you will find all important course information, including the syllabus, reading materials and information for assignments, handouts, announcements, and supplementary information. Quercus is also where the course Discussion Board can be found. Lecture materials (i.e., slides/handouts) will be posted on the Quercus site prior to the start of class. To accommodate student discussion, lectures will sometimes deviate from the posted pre-lecture slides. In these cases, finalized lecture slides will be posted within 48 hours after class each week.

To access Quercus, using your UTORid and password. I strongly recommend regularly checking the "Announcements" sections of the course website, since you are solely responsible for making sure that you stay up to date with course requirements. To facilitate this, please make sure that your Quercus account is up to date so that your correct email address is listed, and that you are receiving notifications of course-wide announcements and emails. If you are registered for the course, you should see this class displayed automatically when you log on via the intranet.

Office Hours (SW565, Mondays 3:30-4:30pm)

Office hours are a great way for you to get answers to specific questions you may have. They are also a good forum for hearing answers to questions that other students have and learning about things you may not have thought about. When you arrive for office hours, please come inside my office, even if other students are already present. That way I will know you are present, and you can hear the discussion with other students.

AccessAbility:

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services as soon as possible.

AccessAbility Services staff (located in Rm SW302, Science Wing) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations [416-287-7560](tel:416-287-7560) or email ability@utsc.utoronto.ca. The sooner you let me know your needs the quicker I can assist you in achieving your learning goals in this course.

Academic Integrity

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (<http://www.governingcouncil.utoronto.ca/Assets/Governing+Council+Digital+Assets/Policies/PDF/ppjun011995.pdf>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

In papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement;
- Submitting your own work in more than one course without the permission of the instructor;
- Making up sources or facts;
- Obtaining or providing unauthorized assistance on any assignment.

On tests and exams:

- Using or possessing unauthorized aids;
- Looking at someone else's answers during an exam or test;
- Misrepresenting your identity; and
- When you knew or ought to have known you were doing it.

In academic work:

- Falsifying institutional documents or grades;
- Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes; and
- When you knew or ought to have known you were doing so.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If students have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, they are expected to seek out additional information on academic integrity from their instructors or from other institutional resources.

Note:

You may see advertisements for services offering grammar help, essay editing and proof-reading. Be very careful. If these services take a draft of your work and significantly change the content and/or language, you may be committing an academic offence (unauthorized assistance) under the *Code of Behaviour on Academic Matters*.

It is much better and safer to take your draft to the Writing Centre as early as you can. They will give you guidance you can trust. Students for whom English is not their first language should go to the English Language Development Centre.

If you decide to use these services in spite of this caution, you must keep a draft of your work and any notes you made before you got help and be prepared to give it to your instructor on request.

Turnitin

Normally, students will be required to submit the written portions of the course assignment to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays and other written materials to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site.

English Language Development Center

This class assumes a degree of fluency in English, for both writing and comprehension. All students are encouraged to take the Academic English Health Check at the start of the term, and to visit the English Language Development Center for support if needed. The ELDC supports all students in developing better Academic English and the critical thinking skills needed in academic communication. Make use of the personalized support in academic writing skills development and Café sessions to enhance your ability to do better in the various components of this course. Details and sign-up information: <http://www.utsc.utoronto.ca/eld/>

Course Schedule

DATE	TOPICS
Jan 7	1. Logistics and Introductions 2. Mini-review (Hutcherson): The What and Why of Social Neuroscience Module I: The positive emotions: Liking, wanting, loving, needing 3. Mini-review (Hutcherson): The neurobiology of reward 4. Skill-building (Hutcherson): Searching for sources
Jan. 14	1. Discussion (All) <i>Suggested Topic: What is the secret to happiness?</i> 2. Skill-building (Hutcherson): Presentations, argumentation and debate 3. Mini-review (Hutcherson): The neurobiology of liking and loving
Jan. 21	1. Student Presentation and Debate <i>On Trial: Should drugs be a part of couples therapy?</i> 2. Skill-building (Hutcherson): Writing I - Thesis, Antithesis, Synthesis 3. Mini-review (Hutcherson): The neurobiology of addiction Topic choice due – Jan. 21 by end of day
Jan. 28	1. Student Presentation and Debate <i>On Trial: Should we (and can we) control our weight?</i> 2. Skill-building (Hutcherson): Writing II - Constructing an outline Module II: The negative emotions: pain, stress, loneliness and disease 3. Mini-review (Hutcherson): The neurobiology of pain
Feb. 4	1. Student Presentation and Debate <i>On Trial: Does social rejection actually “break” our hearts?</i> 2. Mini-review (Hutcherson): The neurobiology of stress and negative emotion Annotated bibliography and outline due – Feb. 8 by end of day
Feb. 11	1. Student Presentation and Debate <i>On Trial: Should we teach emotion regulation in schools to reduce stress?</i> 2. Skill-building (Hutcherson): Writing III - Secrets of effective writing 3. Mini-review (Hutcherson): The debate over “natural kinds” in emotion

Feb. 18 **Reading Week – NO CLASS**

Feb. 25 1. **Discussion (All):**
Suggested Topic: How should we think about emotion categories?

Module III: Impulsivity and self-control

2. Mini-review (Hutcherson): The neurobiology of self-control

Mar. 4 1. **Discussion (All)**
Suggested Topic: Is ego depletion all in our heads?

2. Mini-review (Hutcherson): The neurobiology of empathy and altruism

Essay rough draft due – March 8 by end of day

Module IV: Morality and social behavior

Mar. 11 1. **Student Presentation and Debate**
On Trial: Does being nice require self-control?

2. Skill-building (Hutcherson): Writing IV - Incorporating feedback

3. Mini-review (Hutcherson): The neurobiology of moral behavior

Mar. 18 1. **Student Presentation and Debate**
On Trial: Should neural data be used to grant or deny parole?

2. Mini-review (Hutcherson): *Topic determined by class*

Peer reviews due – March 22 by end of day

Mar. 25 1. **Discussion (All)**
Topic determined by class

Module V: The future of social neuroscience

2. Mini-review (Hutcherson): *Topic determined by class*

Apr. 1 1. **Discussion (All)**
Topic determined by class

2. Mini-review (Hutcherson): The future of social neuroscience

3. Course reflections (All)

Final paper due – April 5 by end of day

Reading List

** Readings marked with a double-asterisk are mandatory readings that every student in the class is expected to read.

† Readings marked with a dagger are potential “evidence” for mock trial presenters in a given week. None of these articles is strictly required reading, but presenters must decide for themselves how to organize and present one or more of these or other papers to make the strongest case for their side of the argument

Week 1

**Adolphs, R. (2010). Conceptual challenges and directions for social neuroscience. *Neuron*, 65(6), 752-767.

**Chavez, R. (2018, November 30). This is your brain on psychology – This is your psychology brain [Blog post]. Retrieved from <https://thehardestscience.com/2018/11/30/this-is-your-brain-on-psychology-this-is-your-psychology-on-brain-a-guest-post-by-rob-chavez/>.

**Purugganan, M., & Hewitt, J. (2004). How to read a scientific article. Retrieved from <http://www.owl.net.rice.edu/~cainproj/courses/HowToReadSciArticle.pdf>

Week 2

**Myers, D. G., & Diener, E. (2018). The scientific pursuit of happiness. *Perspectives on Psychological Science*, 13(2), 218-225.

**Lewis, G. J., Kanai, R., Rees, G., & Bates, T. C. (2014). Neural correlates of the ‘good life’: Eudaimonic well-being is associated with insular cortex volume. *Social Cognitive and Affective Neuroscience*, 9(5), 615-618.

**Rutledge, R. B., Skandali, N., Dayan, P., & Dolan, R. J. (2014). A computational and neural model of momentary subjective well-being. *Proceedings of the National Academy of Sciences*, 111(33), 12252-12257.

Week 3

**Fischer, H. (2016). Is monogamy natural? Of human bonding...and cheating (Chapter 3). In *Anatomy of Love: A Natural History of Mating, Marriage, and Why We Stray. (Completely Revised and Updated with a New Introduction)* W.W. Norton Company

** DiSalvo, D. (2013, February 13). Love in the time of neuroscience. *Forbes*. Retrieved from <https://www.forbes.com/sites/daviddisalvo/2013/02/13/love-in-the-time-of-neuroscience/#59a2ff776ead>

† Scheele, D., Striepens, N., Güntürkün, O., Deutschländer, S., Maier, W., Kendrick, K. M., & Hurlemann, R. (2012). Oxytocin modulates social distance between males and females. *Journal of Neuroscience*, 32(46), 16074-16079.

† Lane, A., Luminet, O., Nave, G., & Mikolajczak, M. (2016). Is there a publication bias in behavioural intranasal oxytocin research on humans? Opening the file drawer of one laboratory. *Journal of Neuroendocrinology*, 28(4).

Week 4

**Smith, D. G., & Robbins, T. W. (2013). The neurobiological underpinnings of obesity and binge eating: a rationale for adopting the food addiction model. *Biological Psychiatry*, 73(9), 804-810.

**Demos, K. E., Heatherton, T. F., & Kelley, W. M. (2012). Individual differences in nucleus accumbens activity to food and sexual images predict weight gain and sexual behavior. *Journal of Neuroscience*, 32(16), 5549-5552.

† Neseliler, S., Hu, W., Larcher, K., Zacchia, M., Dadar, M., Scala, S. G., ... & Marliss, E. B. (2018). Neurocognitive and hormonal correlates of voluntary weight loss in humans. *Cell Metabolism*.

† Fothergill, E., Guo, J., Howard, L., Kerns, J. C., Knuth, N. D., Brychta, R., ... & Hall, K. D. (2016). Persistent metabolic adaptation 6 years after "The Biggest Loser" competition. *Obesity*, 24(8), 1612-1619.

† Vainik, U., Baker, T. B., Dadar, M., Zeighami, Y., Michaud, A., Zhang, Y., ... & Dagher, A. (2018). Neurobehavioural Correlates of Obesity are Largely Heritable. *Proceedings of the National Academy of Sciences*, 115(37), 9312-9317.

Week 5

** Eisenberger, N. I., Lieberman, M. D., & Williams, K. D. (2003). Does rejection hurt? An fMRI study of social exclusion. *Science*, 302(5643), 290-292.

** Coan, J. A., Schaefer, H. S., & Davidson, R. J. (2006). Lending a hand: Social regulation of the neural response to threat. *Psychological Science*, 17(12), 1032-1039.

† Woo, C. W., Koban, L., Kross, E., Lindquist, M. A., Banich, M. T., Ruzic, L., ... & Wager, T. D. (2014). Separate neural representations for physical pain and social rejection. *Nature Communications*, 5, 5380.

† DeWall, C. N., MacDonald, G., Webster, G. D., Masten, C. L., Baumeister, R. F., Powell, C., ... & Eisenberger, N. I. (2010). Acetaminophen reduces social pain: Behavioral and neural evidence. *Psychological Science*, 21(7), 931-937.

Week 6

**Wager, T. D., Davidson, M. L., Hughes, B. L., Lindquist, M. A., & Ochsner, K. N. (2008). Prefrontal-subcortical pathways mediating successful emotion regulation. *Neuron*, 59(6), 1037-1050.

**Kim, P., Evans, G. W., Angstadt, M., Ho, S. S., Sripada, C. S., Swain, J. E., ... & Phan, K. L. (2013). Effects of childhood poverty and chronic stress on emotion regulatory brain function in adulthood. *Proceedings of the National Academy of Sciences*, 201308240.

† Puterman, E., Gemmill, A., Karasek, D., Weir, D., Adler, N. E., Prather, A. A., & Epel, E. S. (2016). Lifespan adversity and later adulthood telomere length in the nationally representative US Health and Retirement Study. *Proceedings of the National Academy of Sciences*, 113(42), E6335-E6342.

† Miller, G. E., Yu, T., Chen, E., & Brody, G. H. (2015). Self-control forecasts better psychosocial outcomes but faster epigenetic aging in low-SES youth. *Proceedings of the National Academy of Sciences*, 112(33), 10325-10330.

Week 7

[Note: This week, and this week only, groups of 3-4 students will be assigned to read **one** of the articles below, and group discussion will involve participation from each group with a specific “expertise.” The articles are listed below, and will be allocated to students during class.]

Anderson, A. K., Christoff, K., Stappen, I., Panitz, D., Ghahremani, D. G., Glover, G., ... & Sobel, N. (2003). Dissociated neural representations of intensity and valence in human olfaction. *Nature Neuroscience*, 6(2), 196.

Chang, L. J., Gianaros, P. J., Manuck, S. B., Krishnan, A., & Wager, T. D. (2015). A sensitive and specific neural signature for picture-induced negative affect. *PLoS Biology*, 13(6), e1002180.

Chikazoe, J., Lee, D. H., Kriegeskorte, N., & Anderson, A. K. (2014). Population coding of affect across stimuli, modalities and individuals. *Nature Neuroscience*, 17(8), 1114.

Kragel, P. A., & LaBar, K. S. (2013). Multivariate pattern classification reveals autonomic and experiential representations of discrete emotions. *Emotion*, 13(4), 681.

Kragel, P. A., & LaBar, K. S. (2015). Multivariate neural biomarkers of emotional states are categorically distinct. *Social Cognitive and Affective Neuroscience*, 10(11), 1437-1448.

Nummenmaa, L., Glerean, E., Hari, R., & Hietanen, J. K. (2014). Bodily maps of emotions. *Proceedings of the National Academy of Sciences*, 111(2), 646-651.

Satpute, A. B., Nook, E. C., Narayanan, S., Shu, J., Weber, J., & Ochsner, K. N. (2016). Emotions in “black and white” or shades of gray? How we think about emotion shapes our perception and neural representation of emotion. *Psychological Science*, 27(11), 1428-1442.

Week 8

**Blain, B., Hollard, G., & Pessiglione, M. (2016). Neural mechanisms underlying the impact of daylong cognitive work on economic decisions. *Proceedings of the National Academy of Sciences*, 113(25), 6967-6972.

**Shenhav, A., Cohen, J. D., & Botvinick, M. M. (2016). Dorsal anterior cingulate cortex and the value of control. *Nature Neuroscience*, 19(10), 1286.

Week 9

**Ruff, C. C., Ugazio, G., & Fehr, E. (2013). Changing social norm compliance with noninvasive brain stimulation. *Science*, 342(6157), 482-484.

** Garrett, H. J. (2018, December 28). The kernel of human (or rodent) kindness. *New York Times*. Retrieved from <https://www.nytimes.com/2018/12/28/opinion/empathy-research-morality-rats.html>.

† Wills, Julian, Oriol FeldmanHall, et al. (2018). "Dissociable contributions of the prefrontal cortex in group-based cooperation." *Social Cognitive and Affective Neuroscience* 13, no. 4 (2018): 349-356.

† Zaki, J., & Mitchell, J. P. (2011). Equitable decision making is associated with neural markers of intrinsic value. *Proceedings of the National Academy of Sciences*, 108(49), 19761-19766.

Week 10

** Darby, R. R., Horn, A., Cushman, F., & Fox, M. D. (2018). Lesion network localization of criminal behavior. *Proceedings of the National Academy of Sciences*, 115(3), 601-606.

† Poldrack, R. A., Monahan, J., Imrey, P. B., Reyna, V., Raichle, M. E., Faigman, D., & Buckholz, J. W. (2018). Predicting violent behavior: What can neuroscience add?. *Trends in cognitive sciences*, 22(2), 111-123.

† Aharoni, E., Vincent, G. M., Harenski, C. L., Calhoun, V. D., Sinnott-Armstrong, W., Gazzaniga, M. S., & Kiehl, K. A. (2013). Neuroprediction of future rearrest. *Proceedings of the National Academy of Sciences*, 201219302.

† McGorry, P. (2017, September 25). Mind-reading technology should not be used to solve crime. *The Conversation*. Retrieved from <http://theconversation.com/mind-reading-technology-should-not-be-used-to-solve-crime-83874>.

Week 11

To be determined, by class vote. Readings will be posted by March 1.

Week 12

To be determined, by class vote. Readings will be posted by March 1.