Junior Seminar in Cognitive Science
CGSC 390
Fall 2018

Instructor: Mark Sheskin
E-mail: mark.sheskin@yale.edu   (for communication)
       msheskin+cgsc390@gmail.com   (for assignments)
Time/Location: Thursdays, 9:25AM-11:15AM; Location BF S-29
Office Hours: Thursdays, 1:00-2:00; SSS 205 H (inside "Panda Lab")
Course Website: on Canvas

Overview

This course is intended for juniors in the cognitive science major. It provides an overview of recent advances in cognitive science, as well as some classic foundational papers. By the end of the semester, you should have a better sense of the content and methods used in cognitive science. The readings in this course may be useful for informing your selection of a senior thesis topic. Given the breadth of cognitive science, we will not be able to address all potential topics (and then the interesting intersections between topics!), and so the final list of readings will be determined based on student interests. This is true for all weeks, but especially weeks later in the semester.

Course Requirements and Evaluation

Weekly Assignments and Seminar Participation

Half of the final grade is based on the weekly assignment pairs (one submitted before each class and one submitted after each class), and the corresponding participation in the seminar discussion. Below are more details about these two types of assignments, and there are examples on the course website.

- The pre-class assignment is specified in the reading guide for the week. You will be asked to provide responses to specified prompts, and are welcome to raise additional points as well. These responses will help to structure the discussion of the upcoming meeting. There is a super-firm deadline of 24 hours before class, because I need time to read your responses and modify my plans for the discussion based on your thoughts.

- The post-class assignment is an update on your initial thoughts based on the in-class discussion. How has your understanding of the material changed following discussion with your peers? What remaining points of confusion or questions do you have? What would you like to know more about? These are due the day after class (though there is not a firm "exactly 24 hours" deadline, because I am not rushing to process them to prepare for an imminent class discussion). You can NOT turn in a post-class update if you did not attend class (see exception below).

Final Project

The other 50% of the final grade will come from a final project submitted at the end of the semester. This paper can be:

> (a) a literature review of a course topic covered in more depth than we did in class, or

> (b) a literature review of a topic related to the course content, but that we did not have time to cover in class, or

> (c) a project proposal for an empirical study related to the course content (note: you do not actually run the project).

We will discuss ideas for projects in more detail partway through the semester, and you will be expected to have a one-page project proposal approved by me shortly thereafter. Your final paper should be between 12 and 15 pages, and may be in a form that will be useful for you in the future (e.g., as a basis for a senior project or a graduate school writing sample). You will also give a short presentation on your paper during Week 12 (most students use PowerPoint for this).

Missing Due Dates and Missing Class

- Being late with pre-class assignments: This is a problem because I need to read these before class and use them to structure the discussion. If this part is late, then you can't get full credit for the week.

- Being late with post-class assignments: This is not as important. You should get them in within 24 hours while your memory of the discussion is still fresh, but it is fine if you are a day late with one or two of them. Also, if you have a very busy 24 hours every week following class, feel free to work out a different due date with me (e.g., you are booked solid through Thursday, you might propose a deadline of 5PM on Friday).

- Being late with the paper proposal or paper draft: This is perfectly fine! My goal with these is just to be helpful towards you having the best final draft possible. If you turn it in early or on time, I'll return comments within a week of whenever you submit. If you want to turn it in late, just e-mail me by the due date to let me know when you plan to turn it in (e.g., "1 day late" vs. "3 days late"). Importantly, if you turn it in late, I can't guarantee how quickly I'll get to it. I will aim to return comments within a week of whenever you submit PLUS the number of days late (e.g., 2 days late means I return comments within 7+2=9 days of submission).

- Being late with final draft: Don't do this. Please don't do this. Not even a minute late. Yale says I have to give you an F on final papers submitted late. (Fortunately, I'll have a draft from you, so I will treat the draft paper as your final

paper…but it will be super sad for you to not get credit for all the improvement you do between draft and late-submitted final!)

- Missing class: I assume everyone has a good reason to miss a single class sometime over the course of the semester—you don't even need to tell me what your reason is! Just e-mail me to let me know you will miss (or did miss) class and to ask for supplementary readings. I'll take a look at your pre-class assignment and provide readings that will help you update it. On the other hand, please do not miss more than one class: after all, supplementary readings can't replace your contributions to the discussion!

Statement on Academic Integrity

Please do not violate academic integrity during this course. Most notably, do not plagiarize. Please see this website for more information:

http://ctl.yale.edu/writing/wr-instructor-resources/addressing-academic-integrity-and-plagiarism

Here is a longer plagiarism warning from the above website: The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Plagiarism is the use of someone else's work, words, or ideas as if they were your own. Here are three reasons not to do it:

- By far the deepest consequence to plagiarizing is the detriment to your intellectual and moral development: you won't learn anything, and your ethics will be corrupted.
- Giving credit where it's due but adding your own reflection will get you higher grades than putting your name on someone else's work. In an academic context, it counts more to show your ideas in conversation than to try to present them as *sui generis*.
- Finally, Yale punishes academic dishonesty severely. The most common penalty is suspension from the university, but students caught plagiarizing are also subject to lowered or failing grades as well as the possibility of expulsion. Please be sure to review Yale's Academic Integrity Policy.

Readings for Each Week

- The below list based on Fall 2017 student preferences.
- The topics and readings may change based on 2018 student interests, as well as papers published during the semester.
- The only required readings each week are those identified with a single letter, and the letters indicate the suggested reading order.
- Optional papers have one of two designations: "REC" = recommended to all students, "SPEC" = potentially of specialized interest to some students.

Week 1: Introduction
August 30

- There are no readings before this first meeting, but there are documents you should read in full after class, including the syllabus and Weekly Assignment guide.

Week 2: The Science of Learning Science
September 6

(A) Science of Learning Science Reading Guide
(B) Freeman et al. (2013). Active learning increases student performance in science, engineering, and mathematics. *PNAS*.
(C) Schmidt et al. (2018). A person-in-context approach to student engagement in science: Examining learning activities and choice. *Journal of Research in Science Teaching.*
(D) Tharayil et al. (2018). Strategies to mitigate student resistance to active learning. *International Journal of STEM Education*.

Week 3: Where did cognitive science come from?
September 13

- (A) Origins of CogSci Reading Guide
- (B) Miller (2003). The cognitive revolution: A historical perspective. *Trends in Cognitive Science*.
- (C) Fodor (1985). Précis of "The Modularity of Mind." *Brain and Behavioral Sciences.*
- (REC) Frankenjuis & Ploeger (2007). Evolutionary psychology versus Fodor: Arguments for and against the Massive Modularity Hypothesis. *Philosophical Psychology*.
- (SPEC) Chomsky (1959). Review of "Verbal Behavior" by B.F. Skinner. *Language*.

Week 4: Meta-issues in cognitive science
September 20

- (A) Meta-issues Reading Guide
- (B) Simmons et al. (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science*.
- (C) Bones & Johnson (2007). Measuring the immeasurable: Or "Could Abraham Lincoln take the implicit association test?" *Perspectives on Psychological Science.*
- (D) Open Science Collaboration (2015). Estimating the reproducibility of psychological science. *Science*. (optional after first page)
- (SPEC) Ioannidis (2005). Why most published research findings are false. *PLoS Medicine.*

Week 5: Proposals for Upcoming Weeks
September 27

- (A) Reading Guide You Create
- (B) First Required Reading You Choose
- (C) Second Required Reading You Choose
- (REC) Optional Reading You Choose

Week 6: Evolution
October 4

- (A) Evolution Reading Guide
- (B) Cosmides & Tooby. Evolutionary psychology primer.
  http://www.cep.ucsb.edu/primer.html
- (C) Dunbar (1998). The social brain hypothesis. *Evolutionary Anthropology*.
- (D) Debove et al. (2015). Evolution of equal division among unequal partners. *Evolution*.
- (REC) Delton & Robertson (2016). How the mind makes welfare tradeoffs: Evolution, computation, and emotion. *Current Opinion in Psychology*.

Week 7: Development and Concepts
October 11

- (A) Development Reading Guide
- (B) Carey (2004). Bootstrapping and the origin of concepts. *Daedalus*.
- (C) Rips et al. (2006). Giving the boot to the bootstrap. *Cognition.*
- (D) Tenenbaum et al. (2011). How to grow a mind. *Science*.
- (REC) Gopnik (2012). Scientific thinking in young children. *Science*.
- (SPEC) Ferry et al. (2015). Prelinguistic Relational Concepts: Investigating Analogical Processing in Infants

OCTOBER RECESS

Week 8: My Work on Moral Development (by student request)
October 25

- (A) Moral Development Reading Guide
- (B) Sheskin et al. (2014). Life History Theory Explains Childhood Moral Development. *Trends in Cognitive Science.*
- (C) Sheskin et al. (2014). Anti-equality: Social comparison in young children. *Cognition,*
- (D) Sheskin et al. (in press). Some Equalities are More Equal Than Others: Quality Equality Emerges Later than Numerical Equality. *Child Development.*
- (SPEC) Skerry et al. (2011). Capuchin monkeys are not prosocial in an instrumental helping task. *Animal Cognition.* (cog sci senior thesis I supervised)

Week 9: Why are we conscious?
November 1

- (A) Consciousness Reading Guide
- (B) Chalmers (2014). How do you explain consciousness? *TED Talk.*
- (C) Wegner (2003). The mind's best trick: how we experience consciousness. *TiCS.*
- (D) Jackson (1982). Epiphenomenal Qualia. *Philosophical Quarterly.*
- (E) Recall from intro cogsci: Bisson (1990). They're made out of meat. *Omni.*
- (F) Recall from intro cogsci: Searle (1980). Minds, Brains, and Programs. *Brain and Behavioral Sciences.*
- (REC) Nagal (1974). What is it like to be a bat? *Philosophical Review.*
- (REC) Gazzaniga (1967). The split brain in [hu]man[s]. *Scientific American.*
- (REC) Block (2015). Consciousness, big science, and conceptual clarity. (Chapter from book on *The Future of the Brain*).

Week 10: Artificial Intelligence
November 8

- (A) AI Reading Guide
- (B) Turing (1950). Computing machinery and intelligence. *Mind.*
- (C) Breazeal (2002). Robots that imitate humans. *Trends in Cognitive Science.*
- (D) Urmson (2015). How a driverless car sees the road. *TED Talk.*
- (E) Still (2015). Is artificial intelligence the next step in advertising? *The Guardian.*
- (REC) Adami (2015). Artificial Intelligence: Robots with Instincts. *Nature.*
- (SPEC) Cully (2015). Robots that can adapt like animals. *Nature.*
- (SPEC) Gold (2009). Using probabilistic reasoning over time to self-recognize. *Robotics and Autonomous Systems.*

Week 11: Emotion
November 15

- (A) Emotion Reading Guide
- (B) Ekman (1969). Pan-Cultural elements in facial displays of emotion. *Science.*
- (C) Russell (2003). Core affect and the psychological construction of emotion. *Psychological Review.* (Only intro and Précis, Part II is optional)
- (D) Sell (2009). Formidability and the logic of human anger. *PNAS*.
- (E) Tracy (2015). The nonverbal communication of emotions. *Current Opinion in Behavioral Sciences*.
- (REC) Salovey (2005). The science of emotional intelligence. *Current Directions in Psychological Science.*
- (SPEC) Lindquist (2012). The brain basis of emotion: A meta-analytic review. *BBS*.
- (SPEC) Lerner (2014). Emotion and decision making. *Annual Review of Psychology*.
- (SPEC) Cosmides (2000). Evolutionary psychology and the emotions. (Chapter from book *Handbook of Emotions*)
- (SPEC) Han (2007). Feelings and consumer decision making: the Appraisal-Tendency Framework. *Journal of Consumer Psychology*.
- (SPEC) Sell (2014). The human anger face evolved to enhance cues of strength. *Evolution and Human Behavior*.
- (SPEC) Averill (2012). The future of social constructivism: Introduction to a Special Section of *Emotion Review*. (also see articles in special section)
- (SPEC) Inzlicht (2015). Emotional foundations of cognitive control. *TiCS*.

NOVEMBER RECESS

Week 12: Student Presentations of Final Projects
November 29

- No readings—but lots of preparing your presentation!

Week 13: Where is cognitive science going?
December 6

- (A) Future of CogSci Reading Guide
- (B) Look through the schedule of the 2018 Cognitive Science Society conference (not the poster sessions, just the talks)
- (C and D) Chose two papers of interest to you (typically 6 pages each). These must be on different topics (typically this means they should come from different sessions). Read these two papers (include links in your reading response).