Introduction to Cognitive Science

COGST 1101/CS 1710/LING 1170/PHIL 1910/PSYCH 1102
Fall 2023
Uris Hall G01
Tuesdays and Thursdays, 1:25pm-2:40pm

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https://cal.com/lzhao/oh

WiM graduate student TA
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Contact:
If you have questions about the syllabus, canvas, or other administrative matters, please email Lisa Zhao fz227@cornell.edu

Course description: This course is an introduction to central issues and themes in cognitive science. We will begin by reviewing work on cognitive architecture and the foundations of cognitive science. Then we will consider several contemporary research domains, including categorization, learning, decision making, memory, and object perception.

Readings:
All readings will be available on canvas or linked through the canvas site.
The required readings will contain information that is not presented in the lecture. You are responsible for knowing the content from both.

Course requirements and grading:

Quizzes: 10%

At the end of class there will be a 1 question quiz, administered through Poll Everywhere, preferably via a smart phone.
The quiz will be a multiple choice or T/F question about material presented in the lecture that day.
The quiz is closed book (you will be asked to put away materials).
It should take no more than 1 minute to complete.

We will automatically drop your 5 lowest quiz scores.

Annotation posts: 15%

Annotation/response.
Each week there will typically be at one Annotation post.
To complete an annotation assignment, read the assigned article and make annotations on the PDF as you read by highlighting text and adding comments and questions. A group of other students will be able to see and reply to your annotations, and you will be able to see and respond to theirs. You must make at least 3 annotations per assignment to get full points. Your grade will be based on your 3 best annotations.
(Further details on how to complete and upload these assignments will be posted on canvas.)

NOTE that at least one your annotations should include some kind of response to the ideas, not just a summary.

The annotations themselves will be due at 5PM the day after the lecture to which they correspond.

Annotation posts will be graded lightly using the following scale:

0 = Not Submitted
1 = Below the Bar; missing something significant (81)
2 = Good (92)

In most cases, you will only receive comments from the TA if you get a 1. If you are getting 2's on all these responses, then you are in good standing in the "Annotation posts" portion of the grade.

We will automatically drop your lowest score as a way to accommodate any emergency situations, illnesses, or just a rough week.

Exams: 75%

There will be 3 exams (each worth 25%), covering material from lectures during the relevant portion of the course. the exams will consist mostly of multiple choice and T/F questions, with a few short answer questions. Exams will be in class.

Exam 1: Sept 26
Exam 2: Oct 26 (noncumulative)
Exam 3: Nov 30 (noncumulative)

The exams will be in class. No notes or devices may be used during the exams.

Even though the Cornell final exam schedule holds a slot for a final exam, we will not have an exam during that period. The last exam of the class is the in-class Exam 3 on the last day of class.

Extra Credit: 2%

There will be opportunities for extra credit. Extra credit can add as much as (and no more than) 2% to your final grade. For example, if at the end of the semester you have earned a final grade of 92% and you complete the maximum amount of extra credit (2%) then you will receive an A in the course (95%). You can earn extra credit (2% maximum) by writing a brief report on either of the following (1 report = up to 1% added to your final grade):

a. a cogsci colloquium talk (see https://events.cornell.edu/search/events?search=cogscievents).
The report should be 1 page, double-spaced. These should be sent to sbn44@cornell.edu
b. the discussion that follows a Sprocket film (see https://cogsci.cornell.edu/sprocket for the schedule). The report should be 1 page, double-spaced. These should be sent to Jeremy Richardson jsr335@cornell.edu, who is facilitating the series.

Grading scheme:

For A-F: …80-82=B-; 83-86=B; 87-89=B+; 90-92=A-; 93-96=A; 97-100=A+.
For S/U, S = 70% or more

Notes on Academic Integrity

1. Each student in this course is required to adhere to Cornell's Academic Integrity Code: http://cuinfo.cornell.edu/aic.cfm
It is your responsibility to familiarize yourself with the Code, and what constitutes a violation of it. All work submitted must be the student's own, and all sources must be properly cited.
2. Students are not permitted to buy or sell any course materials, online or otherwise. This includes handouts, quiz questions, discussion posts, etc. Such behavior constitutes academic misconduct.

Late Work:

Except for lateness due to documented emergencies, late work will be penalized by 1/3 letter grade per day (this is in the interest of fairness to all students).

Use of Canvas Software

You will be automatically enrolled in the Canvas site when you enroll in the course. I will use it to post assignments and send occasional announcements, and you will use it to submit your discussion posts. Finally, your TA might use it to assign homework questions or online discussions. If you have trouble with Canvas, go here first: https://canvas.cornell.edu/courses/1848/pages/student-resources

Students with Disabilities:

Cornell University is committed to ensuring access to learning opportunities for all students. Student Disability Services (SDS) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

- If you are registered with SDS and have a faculty notification letter dated for this semester, please contact me early in the semester to review how the accommodations will be applied in the course. If you have an immediate access need, please see me after class.
- If you have, or think you have, a disability in any area such as, mental health, attention, learning, chronic health, sensory, or physical, please contact the SDS office to arrange a confidential discussion regarding equitable access and reasonable accommodations.
- Students with short-term disabilities, such as a broken arm, can often work with instructors to minimize classroom barriers. In situations where additional assistance is needed, students should contact the SDS as noted above.
- If you are registered with SDS and have questions or concerns about your accommodations please contact your SDS Counselor.

Student Disability Services is located at Cornell Health Level 5, 110 Ho Plaza, 607-254-4545, sds.cornell.edu.

Financial Hardship: https://dos.cornell.edu/first-generation-low-income-student-support/access-fund

Tentative Schedule

The required reading/viewing will not duplicate the material presented in lecture. (Often the optional reading will do that.)
The required reading/viewing will typically be some extension or elaboration on what gets covered in lectures.
The reading/viewing should typically be done after seeing the lecture.

First day (August 22)

Reductionism (Aug 24)

Required reading:

Humphreys, P. (2018). https://aeon.co/essays/atomism-is-basic-emergence-explains-complexity-in-the-universe

#Annotate and comment on the reading

Optional reading:

Churchland, P. (2013). Section on functionalism in "The ontological problem (the mind-body problem)." Ch. 2 of Matter and Consciousness, 3rd Ed. (pp. 63-72). MIT Press.

Kincaid, H. (1990). Molecular biology and the unity of science. *Philosophy of Science*,

57(4), 575-593.

Modularity; Levels and Evolution (Aug 29 & 31)

Aug 29

Required reading:

Firestone, C., & Scholl, B. J. (2016). Cognition does not affect perception: Evaluating the evidence for "top-down" effects. *Behavioral and brain sciences*, *39*.
*Read Section 1 and the first paragraph of section 2. (Skip rest of 2 and all of 3.)
Review Fig 2. Read Sections 4&5.

#Annotate and comment on the reading

Optional reading:

Fodor, J. (1985). Precis to *Modularity of Mind, Behavioral and Brain Sciences*, 8, 1-5.
Quilty-Dunn, J. (2020). Attention and encapsulation. *Mind & Language*, 35(3), 335-349.

Aug 31

Required reading: None
Optional reading:

Marr, D. 1982. *Vision*. MIT Press, chapter 1.
Cosmides, L., and Tooby, J. (1994) Beyond intuition and instinct blindness: Toward an evolutionarily rigorous cognitive science. *Cognition*, 1-14.

Computationalism (Sept 5 & 7)

Computational Theory of Mind (Sept 5)

Required reading: None
Optional reading:

Pinker, S. 1997. *How the Mind Works*. New York, Norton, pp. 64-77.
Bringsjord, S. 2008. Declarative/Logic-based cognitive modeling. In R. Sun (ed.), *Handbook of Computational Psychology*, ***Sections 1, 3 through 3.1.3 (skip 3.1.2), 5 up to 5.1.3, 6***

Neural networks (Sept 7)

Optional viewing:
https://www.youtube.com/watch?v=aircAruvnKk

Required reading: None
Optional reading:

Thomas, M, & McClelland, J. 2008. Connectionist Models of Cognition. In R. Sun (ed.), *Handbook of Computational Psychology*, **pp. 22-27 and section 3.1**

Innateness and the Poverty of the Stimulus (Sept 12)

Required reading:

Friedmann & Rusou (2015). Critical period for first language: the crucial role of language input during the first year of life. *Current Opinion in Neurobiology, 35*: 27-34.

#Annotate and comment on the reading

Optional reading:

Laurence, S. & Margolis, E. 2001. The Poverty of the Stimulus Argument. *British Journal for the Philosophy of Science*, ***Sections 3, 7.2***

Hannagan, T., Amedi, A., Cohen, L., Dehaene-Lambertz, G., & Dehaene, S. (2015). Origins of the specialization for letters and numbers in ventral occipitotemporal cortex. Trends in cognitive sciences, 19(7), 374-382.

Learning (Sept 14; Sept 19)

Required reading: None

Optional reading:

Mandelbaum, E. (2020) Associationist Theories of Thought, SEP section 3, 9.4

Cushman: Action, Outcome and Value, 273-278.

Perfors, A., Tenenbaum, J., Griffiths, T. & Xu, F. 2011. A tutorial introduction to Bayesian models of cognitive development. *Cognition* 120, ***Sections 1,2,4***

Memory (Sept 21)

Required viewing: Elizabeth Loftus

https://www.ted.com/talks/elizabeth_loftus_how_reliable_is_your_memory?utm_campaign=tedspread&utm_medium=referral&utm_source=tedcomshare

Required reading: None

Optional reading:

Gazzaniga et al. (2018). Memory, from *Cognitive neuroscience: the biology of the mind.*

Oliver Sacks, "The Abyss", New Yorker, https://www.newyorker.com/magazine/2007/09/24/the-abyss

Exam 1 (Sept 26)

Perception (Sept 28)

Required reading:

Vallortigara, G., Regolin, L., & Marconato, F. (2005). Visually inexperienced chicks exhibit spontaneous preference for biological motion patterns. *PLoS biology*, *3*(7), e208.

#Annotate and comment on the reading

Optional reading:

Palmer, S. (1999), *Vision science*, ch. 1

Optional viewing:

Visual agnosia

https://www.youtube.com/watch?v=ze8VVtBgK7A

Visual Cognition: Object Perception (Oct 3)

Optional reading:

Green, E. J., & Quilty-Dunn, J. (2020). What is an object file?. *The British Journal for the Philosophy of Science*.

Scholl, B. 2007. Object persistence in philosophy and psychology. *Mind & Language*, 22: 563-591, **Sections 1-4**

Concepts and Categorization (Oct 5)

Required reading: None

Optional reading:

Laurence, S. & Margolis, E. 2019. "Concepts" *Stanford Encyclopedia of Philosophy*, http://plato.stanford.edu/entries/concepts/ ***section 2***

Language understanding (Oct 12)

Required Reading:

Searle, J. R. (1980). Minds, brains, and programs. *Behavioral and brain sciences*, *3*(3), 417-418.

#Annotate and comment on the reading

Optional reading:

Pinker, *The Language Instinct*, chapter 4

Traxler, M. *Introduction to Psycholinguistics.* Chapter 3: Word Processing, **pp. 79-87**

Causal cognition (Oct 17)

Optional Reading:

Gopnik et al. (2001). "Causal learning mechanisms in very young children." *Dev. Psych.* **pp. 620-624; 626-629**

Saxe & Carey 2006. "The Perception of Causality in Infancy" *Acta Psychologica* **sections 1-4**

Optional viewing:

https://www.ted.com/talks/alison_gopnik_what_do_babies_think#t-309763

Theory of mind (Oct 19)

Optional Reading:

Johnson, S. 2003. Detecting Agents, **sections 1-5**

Gray, H., Gray, K. and Wegner, D. 2007: Dimensions of mind perception. *Science*, 315, 619.

Emotion (Oct 24)

Optional reading:

Griffiths, P. E. (1997). *What emotions really are*. University of Chicago Press. Chapter 4.

Frank, R. (1988). *Passions within reason*. Norton. Chapter 3.

Exam 2 (Oct 26)

Decision theory (Oct 31)

Required reading: None

Optional reading:

Stanovich, K. Decision Making, **pp. 8-15**

Rilling & Sanfey 2011. Neuroscience of social decision-making. *Annual Review of Psychology* 62, 23-48.

Reasoning (Nov 2)

Required reading:

Groopman, J. (2007). Mental malpractice. *New York Times*, 7/2/07.

#Annotate and comment on the reading

Optional reading:

Kahneman, *Thinking fast and slow*, chap 26, Prospect theory

Game theory and experimental economics (Nov 7)

Optional Reading:

Fehr, E., & Gächter, S. (2002). Altruistic punishment in humans. Nature, 415(6868), 137-140.

Nov 9: No class

Moral judgment (Nov 14)

Required reading:

Greene, J. D. (2008). The secret joke of Kant's soul. *Moral psychology*, *3*, 59-66

#Annotate and comment on the reading

Optional reading:

Koenigs, M., Young, L., Adolphs, R., Tranel, D., Cushman, F., Hauser, M. D., & Damasio, A. 2007. Damage to the prefrontal cortex increases utilitarian moral judgments. *Nature*, 446 (7138), 908–911.

Social learning and normative cognition (Nov 16)

Optional reading:

Laland (2017) *Darwin's Unfinished Symphony*, Chapter 4 "A tale of two fishes" 77-98.
Henrich *Secret of our success*, Chapter 11, pp. 185-196

Consciousness (Nov 21)

Required reading:

Owen, A. M., Coleman, M. R., Boly, M., Davis, M. H., Laureys, S., & Pickard, J. D. (2006). Detecting awareness in the vegetative state. *Science*, 313(5792), 1402.

#Annotate and comment on the reading

Optional reading:

Chalmers, D. J. (1995). Facing up to the problem of consciousness. *Journal of consciousness studies*, *2*(3), 200-219.

Culture (Nov 28)

Required reading:

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world?. Behavioral and brain sciences, 33(2-3), 61-83, sections 1 and 2.

#Annotate and comment on the reading

Exam 3 (Nov 30)