**Psychology 621**

**Essentials of Cognitive Neuroscience**

**Spring 2017**

  In this course we emphasize the critical evaluation of topical issues and data in working memory research. Toward this end, we also emphasize the methods of neuroimaging, neuropsychology, repetitive transcranial magnetic stimulation (rTMS), electroencephalography (EEG), and experimental psychology.

**Format**: Each week we discuss (at least) one article from the recent literature. These discussions are organized as informal presentations that will give us an opportunity to discuss and assess in detail the theory, methods, results, and interpretation associated with that particular paper. On occasion, these discussions are supplemented with, or supplanted by, an informal presentation of the design and/or results from an experiment being conducted in the Postle laboratory (see section on "3 credits", below). Following the discussion of a particular paper or project, we end the meeting with an attempt to integrate what we've learned from this specific information into the perspective of contemporary cognitive neuroscience inquiry.

  Levels of participation: The class may be taken for 1 or 3 credits. The **requirements for 1-credit** registrants are simply to come to class having read the assigned paper, and prepared to participate in the discussion. The additional **requirements for 3-credit** registrants are to lead one of the weekly discussions, and to write a 3-5 page paper that 1) summarizes the paper; 2) summarizes the question that it was intended to address; and 3) proposes either a) a better way to test this question, or b) a hypothesis that captures an important "next question" that can now be addressed and an experimental design that would effect this hypothesis test. The additional **requirements for 3-credit** registrants are to participate in a research project in the Postle laboratory that entails at least 10 hr./wk. of research time during two consecutive semesters.

**Grading:** **1-credit: in-class participation**

**3-credit: in-class participation, paper, and research**

*Class meets Fridays, from 9:55 am – 10:45 pm, in room 519 Psychology*

Background readings

[Postle BR (2015). The cognitive neuroscience of visual short-term memory, Current Opinion in Behavioral Sciences, 1: 40-46.](https://postlab.psych.wisc.edu/index.php/download_file/view/391/237/)

[Aschwanden C (2014). Harassment in Science, Replicated. New York Times, August 11.](http://www.nytimes.com/2014/08/12/science/harassment-in-science-replicated.html)

[Carandini, M., & Heeger, D. J. (2012). Normalization as a canonical neural computation. Nature Reviews Neuroscience, 13(1), 51-62](https://postlab.psych.wisc.edu/index.php/download_file/view/592/237/).

January 20

[van Kerkoerle, T., Self, M. W., & Roelfsema, P. R. (2017). Layer-specificity in the effects of attention and working memory on activity in primary visual cortex. Nature Communications, 8, 13804.](https://postlab.psych.wisc.edu/index.php/download_file/view/598/237/)

January 27

[Reinhart, R. M., Cosman, J. D., Fukuda, K., & Woodman, G. F. (2017). Using transcranial direct-current stimulation (tDCS) to understand cognitive processing. Attention, Perception, & Psychophysics, 79(1), 3-23.](https://postlab.psych.wisc.edu/index.php/download_file/view/580/237/)

February 3

[Pertzov, Y., Manohar, S., & Husain, M. (2016). Rapid Forgetting Results From Competition Over Time Between Items in Visual Working Memory.](https://postlab.psych.wisc.edu/index.php/download_file/view/573/237/)

February 10

[Romei, V., Chiappini, E., Hibbard, P. B., & Avenanti, A. (2016). Empowering reentrant projections from V5 to V1 boosts sensitivity to motion. Current Biology, 26(16), 2155-2160.](https://postlab.psych.wisc.edu/index.php/download_file/view/575/237/)

February 17

[Cole SR & Voytek B, Brain oscillations and the importance of waveform shape, Trends Cogn Sci (in press)](https://postlab.psych.wisc.edu/index.php/download_file/view/576/237/)

February 24

Fiebig, F., & Lansner, A. (2016). A spiking working memory model based on Hebbian short-term potentiation. Journal of Neuroscience, 1989-16.

March 3

[Engel, T. A., Steinmetz, N. A., Gieselmann, M. A., Thiele, A., Moore, T., & Boahen, K. (2016). Selective modulation of cortical state during spatial attention. Science, 354(6316), 1140-1144.](https://postlab.psych.wisc.edu/index.php/download_file/view/589/237/)

March 10

[Briggs, F., Mangun, G. R., & Usrey, W. M. (2013). Attention enhances synaptic efficacy and the signal-to-noise ratio in neural circuits. Nature, 499(7459), 476-480.](https://postlab.psych.wisc.edu/index.php/download_file/view/588/237/)

March 17

[Chen, J., Leong, Y. C., Honey, C. J., Yong, C. H., Norman, K. A., & Hasson, U. (2016). Shared memories reveal shared structure in neural activity across individuals. Nature Neuroscience.](https://postlab.psych.wisc.edu/index.php/download_file/view/599/237/)

March 24

**Spring Break and CNS**

March 31

[Slagter, H. A., Mazaheri, A., Reteig, L. C., Smolders, R., Figee, M., Mantione, M., & Denys, D. (2016). Contributions of the ventral striatum to conscious perception: An intracranial EEG study of the attentional blink. Journal of Neuroscience, 2282-16.](https://postlab.psych.wisc.edu/index.php/download_file/view/577/237/)

April 7

[Yoon, J.H., Grandelis, A., Maddock, R.J. (2016). Dorsolateral Prefrontal Cortex GABA Concentration in Humans Predicts Working Memory Load Processing Capacity. The Journal of Neuroscience 36(46):11788-11794.](https://postlab.psych.wisc.edu/index.php/download_file/view/570/237/)

April 14

Ayelet, A., Nitzan, C., & Ilan, D. (2016). Neural variability quenching predicts individual perceptual abilities. Journal of Neuroscience, 1671-16.

April 21

**TBD**

April 28

**TBD**

**University legislation specifies that the following must appear on the syllabus**:

**Where to take complaints about a Teaching Assistant or Course Instructor:**

Occasionally, a student may have a complaint about a Teaching Assistant or course instructor. If that happens, you should feel free to discuss the matter directly with the TA or instructor. If the complaint is about the TA and you do not feel comfortable discussing it with him or her, you should discuss it with the course instructor. If you do not want to approach the instructor, make an appointment to speak to the Department Chair, Professor Patricia Devine: [chair@psych.wisc.edu](mailto:chair@psych.wisc.edu).

If your complaint has to do with sexual harassment, you may also take your complaint to Vicky Lenzlinger, Instructional Program Manager, [vlenzlinger@psych.wisc.edu](mailto:vlenzlinger@psych.wisc.edu). Her office is located on the second floor of the Psychology building, room 222.

If you believe the TA or course instructor has discriminated against you because of your religion, race, gender, sexual orientation, or ethnic background, you also may take your complaint to the Office of Equity and Diversity, room 179-A Bascom Hall, or go to: <http://www.oed.wisc.edu/>

(Optional) If your TA is not a native English speaker and you have difficulty understanding his or her speech, ask the TA to repeat sentences that you do not understand.  If you have serious or prolonged difficulty understanding, discuss the problem with the course instructor.  But remember that this is a multicultural institution and that the diversity of TAs can add substantially to your education.  Some patience with unfamiliar accents may reward you with a better understanding of the world*.*

**Ethics of being a student in the Department of Psychology**

The members of the faculty of the Department of Psychology at UW-Madison uphold the highest ethical standards of teaching and research. They expect their students to uphold the same standards of ethical conduct. By registering for this course, you are implicitly agreeing to conduct yourself with the utmost integrity throughout the semester.

In the Department of Psychology, acts of academic misconduct are taken very seriously. Such acts diminish the educational experience for all involved – students who commit the acts, classmates who would never consider engaging in such behaviors, and instructors. Academic misconduct includes, but is not limited to, cheating on assignments and exams, stealing exams, sabotaging the work of classmates, submitting fraudulent data, plagiarizing the work of classmates or published and/or online sources, acquiring previously written papers and submitting them (altered or unaltered) for course assignments, collaborating with classmates when such collaboration is not authorized, and assisting fellow students in acts of misconduct. Students who have knowledge that classmates have engaged in academic misconduct should report this to the instructor.

For detailed information on how to avoid plagiarism, please see the following website: <http://writing.wisc.edu/Handbook/QuotingSources.html>

Your instructor will contact you if s/he has concerns about academic misconduct. You will have an opportunity to explain your work and address your instructor’s concerns. Following the meeting, if your instructor believes that you engaged in misconduct, s/he will decide on an action. Following UW protocol, your instructor will inform the Dean of Students’ Office of the outcome of the meeting and proposed sanction. Penalties for substantiated cases of academic misconduct include a zero on the assignment or exam, a lower grade in the course, and failure in the course. Repeated acts of academic misconduct may result in more serious actions such as probation or suspension. For complete information on proper conduct, academic misconduct, and sanctions, please see UWS Chapter 14:  <http://students.wisc.edu/saja/misconduct/UWS14.html>