

Psychology 414
Cognitive Psychology
Fall 2019

Course Goal: To develop an appreciation for what we know about human cognition (content), how we acquire this knowledge (methodology), and how to evaluate it (critical thinking). The course will emphasize three themes:

1. Understanding the cognitive system is a scientific undertaking. Like any other science, cognitive psychology requires formulation of theories, not just the collection of facts. (And also like any other science, proving facts and testing theories requires rigorous experimentation; one cannot rely on intuition about “how it seems like things should work”.)
2. The major purpose of experiments is to help us discriminate between good theories of cognition (those that might be correct) and poor theories (those that can’t be correct).
3. Because cognition arises from the brain, understanding brain function and brain-behavior relations can give us important insights about the organization of cognitive processes.

Learning Outcomes:

Upon satisfactory completion of this course, students will be able to:

- describe the anatomical structures, and neurotransmitter systems, associated with the following major classes of cognition: perception, attention, motor control, memory, and cognitive control;
- explain the process of the transduction of information from the outside world into a neural code, and the brain’s representation of that information in any of multiple mental codes;
- interpret graphical depictions of experimental data, including accuracy and reaction time;
- critically evaluate claims about cognitive psychology and cognitive neuroscience as they appear in the popular press

Instructor: Brad Postle, 515 Psychology, 262-4330, postle@wisc.edu

Office hours by appointment.

TA: Quan Wan; office: 511 Psychology; qwan22@wisc.edu. Office hours: Mon., 4-5pm; Wed. 1-2 pm.

With the exception of time-sensitive emergencies, email is the most effective and preferred way for you to contact us.

Format: Two weekly lectures plus outside-of-class Web-based quizzes. Assigned readings will be drawn from the required textbook, Anderson (2015), as well as excerpts from an advance draft of Postle (2020). These readings will provide important background for the lectures, and so STUDENTS ARE ENCOURAGED TO READ THE MATERIAL BEFORE COMING TO CLASS.

There are three equally weighted **exams**, each testing your understanding of the material associated with one of the three sections into which the course is organized. Note that information from each of the three principal media used in the course -- readings, lectures, quizzes -- will appear on the exams. Each of the exams is in-class, and none is cumulative. Exams are multiple-choice, fill-in-the-bubble-with-a-#2-pencil format. There are typically about 50 questions on each exam, and time allotted for taking each exam is 75 min – the duration of class period.

Outside of class there will be a series of **Web-based quizzes**, administered via Canvas. There will be one quiz corresponding to the content of each lecture, with the due date for each quiz falling several days after its associated lecture (due dates for each quiz are specified in the syllabus). There are fourteen quiz due dates throughout the semester and for each one a student can earn 1, .5, or 0 points.

You must complete each quiz assignment by 9:00 am on the assignment's due date in order to get full credit. Quiz assignments submitted within one week after the due date (i.e., by 9:00 am seven days after the due date) will receive 1/2 credit; those later than one week will receive no credit.

Grading: Grades on each exam, and for the course overall, will be assigned using criteria no more stringent than, $A \geq 90\%$; $AB \geq 87\%$; $B \geq 80\%$; $BC \geq 75\%$; $C \geq 70\%$; $D \geq 63\%$. That is, *there is no curve, so the grade you earn is a direct function of your own performance, and uninfluenced by the class average*¹. Each exam counts toward 25% of your final grade. The remaining 25% is determined by the timeliness with which you perform each quiz.

At the end of the semester, there will invariably be students whose numerical grade in the course is extremely close to, but just below, a letter-grade cut-off. In order to be fair to all students, however, **we observe a strict policy of not rounding numerical grades to the nearest integer** (and not entertaining requests to deviate from this policy on an individual basis). There are no opportunities for "extra credit" projects that might boost one's score. Your final grade for the course is determined solely by your performance on the exams and the diligence with which you get your quiz assignments in on time. (The time to start concerning yourself about your grade in the course, therefore, begins on Sept. 5, not on days when exam scores are posted!)

Missing exams, make-ups, and extensions on quiz deadlines: Per University policy, you have two weeks (i.e., until 9/19/19) to make arrangements with the professor about making up an exam due to a conflict (e.g., if you know that you'll be missing class on a particular day due to a trip, a religious observance, etc.). The same policy applies to quizzes. We will not consider requests for make-ups or deadline extensions after 9/19/19 for conflicts that could have been predicted at the beginning of the semester. We are, of course, much more flexible regarding unforeseen circumstances, such as illness or a family emergency. (In cases of illness, we'll expect you to send an email to the TA (qwan22@wisc.edu) on the day of the missed lecture or, if that's not possible, to be able to supply reasonable documentation after the fact.)

More about Quizzes

The pedagogical motivation for these quizzes is a phenomenon that has been studied extensively by cognitive psychologists, called the test-enhanced learning effect. This phenomenon will be considered in some detail in the first lecture of the semester, and again in the section on learning and memory. And it works! See *Hattikudur, S. and Postle, B.R. (2011). Effects of test-enhanced learning in a cognitive psychology course. Journal of Behavioral and Neuroscience Research, 9, 151-157.*

Downloadable from postlab.psych.wisc.edu → "publications" link

(Note that from a practical perspective these quizzes are best construed as "homework").

PLEASE NOTE: The customary rules of thumb about academic honesty pertain to the quizzes as well as to other aspects of this course. Thus, for example, each student is expected to perform each quiz him/herself.

Please read this section carefully. Administering quizzes via Canvas is somewhat kludgy, but if you follow these instructions it will work the way that we need it to. To access each quiz, first **select the "Modules" link** from the column on the left-hand side of the of the course's home page. Note: **Do not select the link called "Quizzes", nor the link called "Assignments"**.

Once you're in the Modules page, scroll down until you get to the quiz that you want to take. Note that we've set it up with two constraints: 1) quizzes have to be taken in order; 2) you will not be able to

¹ In principle, if class average grades were atypically low, we could consider scaling grades "up," which could only help everyone. In the history of me teaching this course, however, we've never had to do this.

proceed from one quiz to another until you get all the questions on the previous quiz correct (we'll define what this means further along).

From the Modules page, you'll be able to see that each quiz that you have successfully completed is marked with a green "✓". If you've previously attempted a quiz, but didn't get all the questions correct, it will have a red "⊖" next to it. If a quiz has the red "⊖", you'll need to successfully complete that quiz before you can proceed to the next one.

Within each quiz, there are two parts: a short-answer section and two-to-four multiple-choice questions. The short-answer question within each quiz will be called "Question 1," and you need to write in a sentence or two to answer this question as accurately as you can. Once you have answered this question, hit the "Next" button at the bottom of the page, and you'll be taken to "Question 2", which will be a multiple-choice question. Once you've answered the final multiple-choice question of that quiz, click the "Submit Quiz" button. If you answered all of the multiple-choice questions correctly, the interface will allow you to proceed to the next quiz. If you answered any of the multiple-choice questions *incorrectly*, you will be taken to an overview of the quiz, the question(s) that you answered incorrectly will be highlighted in red, and feedback will be given to explain why your answer was incorrect. Once you've looked this over, you can select the "Take the Quiz again" button, and then take the quiz again. The system is set up so that you will not be able to proceed to the subsequent quiz until all the questions on the current one have been answered correctly. (Note that although Canvas does not "grade" your short-answer question, the TA will spot check short-answer questions from a randomly selected subset of students each week, and blank or otherwise "fake" responses will result in a score 0 for that quiz.)

Advice: Keep in mind that these quizzes are a tool to enhance your learning of the material from this course (see *Hattikudur, S. and Postle, B.R. (2011)*, on the previous page). To take maximal advantage of them, we suggest three things. *First*, although you will for-sure want to have done the assigned readings and looked over your notes beforehand, try to take the quiz without any external aids. Even if you're not sure that you know the answer, or everything that there is to be known about the question, careful, hard thinking is an important element to making the test-enhanced learning effect work. *Second*, after you've completed each section of multiple choice questions, go back and look at what you wrote down for your short answer. If your short answer does not include a concept or fact that is emphasized in any of the multiple-choice questions, ask yourself why. Is there just a superficial reason, like word choice, that makes your short answer different, or did your short answer not include the important conceptual point that the multiple-choice question was probing? If it's the latter, now's the time to go back through your lecture notes and/or the reading to find the critical information. If you're still not sure that you've found it, or if you don't you fully understand it, reach out to the TA or the professor. *Third*, once you've completed the quiz and are comfortable that you understand what information it was probing, go to your lecture notes, and to the book, and highlight and/or annotate (i.e., add additional notes in the margin) what's already written there. This final step will help you the next time you look at this material, such as when you're studying for the exam.

Monitoring your grade on Canvas: After quiz assignments and exams have been graded, you can view your grades and keep track of your progress in the course by clicking on "**Grades**."

Periodic announcements and modifications to the syllabus will also be posted on the course's Canvas page.

"Laptop lane": Taking notes in class on a laptop is permissible, *although you should know that there is research suggesting that students who do so perform worse than do their peers who take notes on paper*. Checking Facebook in class is frowned upon, and *there is strong evidence that "multitasking" on a computer during lecture negatively impacts learning*. Further, there is research suggesting that this effect even generalizes to students who are just sitting near a "multitasking" classmate – it's the "second-hand smoke" of electronic media usage. In view of this, students who want to sit with an open

laptop during lecture will be asked to sit in a dedicated section of the lecture hall, probably the right-side section of seats (as you face the front).

Slides from lecture; lectures notes; videos of lecture: With rare exception, slides presented during lecture are NOT posted either before or after lecture. Being able to sit through a presentation and selectively write down what's important, and to not write down what's not important, is an important skill that you'll often need to draw on throughout your adult life. Early in the semester we will make available to the entire class an example of "good notes" that have been taken by one of your classmates. If, in addition to this, you want advice about effective note taking, or want to have an example of your notes evaluated, the TA or the professor will be happy to help. (The exception to the "no slides" policy will be for individual images that are extraordinarily complicated, or perhaps that include hard-to-draw animations. These will either be flagged as they arise during lecture, and posted later that same day, or, in some cases, you'll be alerted ahead of time that a key slide is going to be posted prior to lecture and you'll be encouraged to bring a printout of that image to lecture in order to be able to make notes directly on it.)

Lectures will be videotaped, but only made available to individual students in special circumstances:

- A planned, pre-approved absence that was made known to the professor prior to 9/19/19;
- Absence due to an unforeseen serious event that precludes lecture attendance, such as illness or a family emergency. (In cases of illness, we'll expect you to send an email to the TA (qwan@wisc.edu) on the day of the missed lecture or, if that's not possible, to be able to supply reasonable documentation after the fact.)
- A reasonable conflict that arises during the course of the semester. (One example might be for a senior who may be interviewing for jobs or for graduate school, and can't know months in advance when these might occur.)

Readings: Required Textbook: Anderson, J.R. (2015) *Cognitive Psychology and its Implications*. **Eighth Edition**. Worth Publishers, New York, N.Y.

In addition, there will be a few readings that will be available on e-reserve or the course's Canvas page, those listed as *Postle(2020)ChptX excerpts* being drawn from the textbook, *Essentials of Cognitive Neuroscience*, 2nd ed., Wiley Blackwell.

Date	Topic	Reading (Anderson , 8 th Ed.)
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Section I: Perception and Attention

September 5	1. Introduction/History	pp. 1-10
September 10	2. The Brain	pp. 10-26
September 12	3. Perception: Vision	Chpt. 2
	<i>Quiz 1 due</i>	
September 17	4. Perception: Neuropsychology of vision; other sensory modalities	Postle(2020)Chpt5exerpts.pdf
	<i>Quizzes 2 and 3 due</i>	
September 19	5. A special case of Vision: Word Recognition; Connectionism	Postle(2020)Chpt3exerpts.pdf
September 24	6. Attention	Chapter 3
	<i>Quizzes 4 and 5 due</i>	
September 26	7. Attention: Spatial Cognition; Neuropsychology of Attention	Postle(2020)Chpt7exerpts.pdf
October 1	Exam 1	
	<i>Quizzes 6 and 7 due</i>	

Section II: Representation and Memory

October 3	8. Mental Codes: Introduction; Imagery	Chpt. 4
October 8	9. Mental Codes: Cognitive Maps and their neural correlates	Tolman (1948)
	<i>Quiz 8 due</i>	
October 10	10. Mental Codes: Knowledge-based Representations	pp. 133-149
October 15	11. Long-term Memory Encoding	Chpt. 6
	<i>Quizzes 9 and 10 due</i>	
October 17	12. Long-term Memory Retrieval	Chpt. 7
October 22	13. Short-term and Working Memory	pp.124-132;
	<i>Quizzes 11 and 12 due</i>	
	<i>No classroom lecture on 10/22 – Society for Neuroscience annual conference</i>	
	<i>Watch video lecture linked to course's Canvas page</i>	
October 24	14. Learning	Tolman (1948) [not a typo]
October 29	15. Cognitive Neuroscience of Memory	Postle(2020)Chpt11exerpts.pdf
	<i>Quizzes 13 and 14 due</i>	
October 31	Exam 2	
	<i>Quiz 15 due</i>	
November 5	16. Metacognition & Memory Errors	Chpt. 8

Section III: High-Level Cognition, Cognitive Control, Communication, Consciousness

November 7	17. Cognitive Control	Postle (2020)Chpt15exerpts.pdf
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November 12	18. Action and Embodiment <i>Quizzes 16 and 17 due</i>	Postle (2020)Chpt8exerpts.pdf
November 14	19. Decision Making	Chapter 10
November 19	20. Reasoning <i>Quiz 18 and 19 due</i>	pp. 426-457
November 21	21. Problem Solving	Chpt. 11
November 26	22. Auditory and Speech Perception; Structure of language	pp. 43-47, Chapter 12
December 3	23. Language Comprehension and Production <i>Quizzes 21 and 22 due</i>	Chapter 13
December 5	24. Consciousness	Postle (2020)Chpt20exerpts.pdf
December 10	Exam 3 <i>Quizzes 23 and 24 due</i>	

Diversity and Inclusion:

Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world. <https://diversity.wisc.edu/>

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.

Complaints:

Occasionally, a student may have a complaint about a TA 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. Complaints about mistakes in grading should be resolved with the TA and/or instructor in the great majority of cases. If the complaint is about the instructor (other than ordinary grading questions) and you do not feel comfortable discussing it with him or her, make an appointment to speak to the Associate Chair for Undergraduate Studies, Professor Maryellen MacDonald (mcmacdonald@wisc.edu).

If your complaint concerns sexual harassment, you may also take your complaint to Dr. Linnea Burk, Clinical Associate Professor and Director, Psychology Research and Training Clinic, Room 315 Psychology (262-9079; burk@wisc.edu).

If you have concerns about climate or bias in this class, or if you wish to report an incident of bias or hate that has occurred in class, you may contact the Chair of the Department, Professor Craig Berridge (berridge@wisc.edu) or the Chair of the Psychology Department Climate & Diversity Committee, Professor Martha Alibali (martha.alibali@wisc.edu). You may also use the University's bias incident reporting system, which you can reach at the following link: <https://doso.students.wisc.edu/services/bias-reporting-process/>.

Accommodations Policy:

The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations, as part of a student's educational record is confidential and protected under FERPA.