University of Waterloo
Department of Psychology
PSYCH 398
Research in Memory
Winter 2016
10:00-11:30 TTH, PAS 4032

Instructor and T.A. Information

Instructor: Evan F. Risko
Office: PAS 4010
Office Phone: (519) 888-4567 ext 38135
Office Hours: Tuesday 11:30-1:30pm (or by appointment)
Email: efrisko@uwaterloo.ca

T.A.	Syaheed Jabar
Email	s2jabar@uwaterloo.ca
Office	PAS 2261
Office Hours	Monday 11:30-12:30 (or by appointment)

Please contact the instructor and TA using the email address provided above. If we need to contact you, then we will do so using your official uWaterloo address. Students are responsible for all e-mail that is sent to the official uWaterloo email address. Check e-mail regularly for important and time sensitive messages.

Course Description

The goal of the course is to introduce students to the theoretical and practical aspects of memory research. Readings will focus on important topics in memory research with an emphasis on the wide variety of methods being applied in the search for a deeper understanding of human memory and on learning how to critically evaluate research.

Course Goals and Learning Outcomes

Upon completion of this course, students should be able to:

A. Demonstrate knowledge of major concepts, theories, and empirical findings in memory research
B. Demonstrate the ability to comprehend primary source articles in memory research. This will involve the ability to understand research methods, interpret basic statistics, and understand experimental logic
C. Demonstrate the ability to understand basic and applied research and how research in memory contributes to both of these scientific enterprises
D. Demonstrate the ability to think critically and communicate effectively about research in memory

Required Text

There is no textbook for this course.

Readings Available on LEARN

Readings for the course will consist of primary source material (i.e., journal articles). While the number of pages of text required each week may not be high, reading primary source material is typically much more challenging than textbooks so you should be prepared to read papers more than once. All readings are available on LEARN.

Course Requirements and Assessment

Assessment	Weighting
Quizzes	50%
Article Presentation	12.5%
Written Assignment	12.5%
Poster Presentations	12.5%
Participation	12.5%
Total	100%

Quizzes (50%)

There will be 10 quizzes in the course. These quizzes will correspond to the topics for the previous 2 weeks (accept Quiz 1 which will be based on only the first week). This includes readings and material presented in student presentations. Each quiz is worth an equal portion of your grade. Your worst quiz will not contribute to your grade. Quizzes will be multiple-choice and short answer. The quizzes are timed, with only 15 minutes available for each. The quizzes will be taken in class and tentative quiz dates are listed below. When completing multiple-choice questions you must choose the best answer for each question, even though the other answers may have some qualities of a correct answer. The quiz dates are tentative:

Quiz 1: Jan 12th
Quiz 2: Jan 19th
Quiz 3: Jan 26th
Quiz 4: Feb 2nd
Quiz 5: Feb 23rd
Quiz 6: Mar 1st
Quiz 7: Mar 8th
Quiz 8: Mar 15th
Quiz 9: Mar 22nd
Quiz 10: Mar 29th

Article Presentation (12.5%)

The article presentation component of the course will consist of an approximately 25-30 minute PowerPoint presentation of a research paper in class. The course centers on student presentations of articles and associated discussion thus it is critical that you prepare your presentation with great care.

There should be enough detail that your audience can understand:
(1) the motivation for the investigation described in the article (i.e., why did they do it?)
(2) the nature of the experiments discussed/reported and their relation to the motivation for the research presented in the article (i.e., why did they do it the way they did it?)
(3) the predictions (if available)
(4) the results, including relevant information about the statistics provided (if available please SHOW us the data in the presentation; what did they find?)
(5) how the authors interpreted their results and the general conclusions that they drew

Furthermore, students will be expected to go beyond the paper in some meaningful respect in order to aid students in understanding their article (e.g., showing data from a related study, showing a video to help illustrate a concept or tool etc.). Think of your presentation as "teaching" the class about your article. The student presenter will be considered the "expert" on that article and as such should be able to answer questions from other students and the instructor during their presentation. If you are unclear on any aspect of the article you have been assigned, then you need to discuss it with the TA or instructor BEFORE class. Your presentation slides are due 1 week before your presentation for review by the TA or instructor. Provided the latter, you will be given feedback about your presentation and expected to integrate that feedback prior to your presentation. Handing in your presentation on time and integrating feedback will be a part of your grade. A copy of your slides will be provided to other students.

Written Assignment (12.5%) – Due Mar 31st

Research in memory is motivated by both applied and theoretical goals. One applied area of memory research that has particularly important implications for students is research investigating the best way to study in order to maximize long term retention. This is an area of research that takes the basic goal of understanding memory and applies it to a particular context (i.e., studying). In your research paper you will summarize recent research (specific articles below) on this issue and propose a novel experiment, using your own ideas, that meangingfully extends this research. The papers you will draw from are included below (i.e., under the Target Articles heading).

These papers will consist of two components:
a) Summary. Summarize the research in the 5 target articles and what each means with respect to how students should study in order to maximize learning and long term retention. This summary should demonstrate clearly that you understand the material presented.

b) Proposed Experiment. Using your summary as a starting point, generate a novel experiment that extends this research in a meaningful way. Describe your experiment with sufficient methodological and theoretical detail for a good understanding of the experiment you propose, how it relates to the research you have summarized, and what new knowledge your experiment would create. You are encouraged to discsuss your idea with the instructor or TA.

Requirements
The paper must be at least 8 pages and no longer than 9 pages including references
The description of the proposed experiment should be at least 2 pages
You must use 12 point Times New Roman font, double spaced, 2.5 cm margins
Use APA. You must cite the 5 articles below correctly and any other source you draw from
Please submit to the electronic drop box on LEARN on or before midnight Mar 31st 2016.
You are responsible for keeping a copy of the final version of your paper.

Target Articles for the Written Assignment (all must be cited and summarized in your paper)
(1) Rohrer, D. & Pashler, H. (2010). Recent research on human learning challenges conventional instructional strategies. Educational Researcher , 39, 406-412.
(2) Roediger, H. L., & Karpicke, J. D. (2006). Test-enhanced learning: Taking memory tests improves long-term retention. Psychological Science, 17, 249-255.
(3) Seabrook, R., Brown, G. D. A., & Solity, J. E. (2005). Distributed and massed practice: From laboratory to classroom. Applied Cognitive Psychology, 19, 107-122.
(4) Rohrer, D., & Taylor, K. (2007). The shuffling of mathematics practice problems boosts learning. Instructional Science, 35, 481-498.
(5) Rohrer, D., Taylor, K., Pashler, H., Wixted, J., & Cepeda, N. J. (2005). The effect of overlearning on long-term retention. Applied Cognitive Psychology, 19, 361-374.

Poster Presentations (12.5%) – Due Feb 2nd

The poster presentation component of the course will consist of the presentation of a research paper in the form of a poster. Poster presentations constitute an important avenue for the communication of research. You may choose the paper you wish to present with the requirment that your paper address an issue in memory research that deals with basic and/or applied issues regarding the malleability of human memory (e.g., misinformation effects, false memory, eyewitness memory). Please email the instructor the paper you want to present before Jan 21st so that it can be approved. You will be marked both on the content and your presentation. If you are not presenting, then you are expected to attend the poster session and to visit your classmates' posters (this will be part of your participation grade). All posters are due Feb 2nd. Students will present their posters in one of three poster sessions (Feb. 4th, Feb. 9th, Feb 11th). Your presentation date will be assigned to you. Further information about how to prepare a poster will be provided in class.

Participation and Class Activities (12.5%)

This class is based on an open exchange of ideas. It is absolutely essential that you come prepared to discuss the readings. Your participation mark will be determined by the quantity and quality of your contributions to the class. This will include, but is not limited to, asking questions, answering questions, participating in discussion, attending class, attending poster sessions, and paying attention to your classmate's presentations. This mark will also include completion of in class activities (e.g., as part of the programming and data analysis sections).

Course Outline

Week - Date	Topic	Readings Due
Week 1 - 05-Jan	Organizational Meeting	None
Week 1 - 07-Jan	Memory Systems	Tulving, E., Schachter, D. L., McLachlan, D. R., & Moscovitch, M. (1988). Priming of semantic autobiographical knowledge: A case study of retrograde amnesia. Brain & Cognition, 8, 3-20. Presented by: Evan Corkin, S. (1984). Lasting consequences of bilateral medial temporal lobectomy: Clinical course and experimental findings in HM. Seminars in Neurology, 4, 249-259. Presented by: Evan
Week 2 - 12-Jan	Memory Loss	Mackinnon, D. F., & Squire, L. R. (1989). Autobiographical memory and amnesia. Psychobiology, 17, 247-256. Presented by: Zola-Morgan, S. M., & Squire, L. R. (1990). The primate hippocampal formation: Evidence for a time-limited role in memory storage. Science, 250, 288-290. Presented by:
Week 2 - 14-Jan	Memory Loss	Wixted, J. T. (2005). A theory about why we forget what we once knew. Current Directions in Psychological Science, 14, 6-9. Presented by: Schiller, D., Monfils, M. H., Raio, C. M., Johnson, D. C., LeDoux, J. E., & Phelps, E. A. (2009). Preventing the return of fear in humans using reconsolidation update mechanisms. Nature, 463, 49-53. Presented by:
Week 3 - 19-Jan	Encoding & Retrieval	Roediger, H. L. (1980). The effectiveness of four mnemonics in ordering recall. Journal of Experimental Psychology: Human Learning and Memory, 6, 558. Presented by:

Week - Date	Topic	Readings Due
Week 3 - 21-Jan	Encoding & Retrieval	Nairne, J. S., Pandeirada, J. N., & Thompson, S. R. (2008). Adaptive memory: The comparative value of survival processing. Psychological Science, 19, 176-180. Presented by: Castel, A. D., Vendetti, M., & Holyoak, K. J. (2012). Fire drill: Inattentional blindness and amnesia for the location of fire extinguishers. Attention, Perception, & Psychophysics, 74, 1391-1396. Presented by:
Week 4 - 26-Jan	Encoding & Retrieval	Morris, C. D., Bransford, J. D., & Franks, J. J. (1977). Levels of processing versus transfer appropriate processing. Journal of Verbal Learning and Verbal Behavior, 16, 519-533. Presented by: Godden, D. R., & Baddeley, A. D. (1975). Context-dependent memory in two natural environments: On land and underwater. British Journal of psychology, 66, 325-331. Presented by:
Week 4 - 28-Jan	Encoding & Retrieval	Roediger, H. L., & Karpicke, J. D. (2006). Test-enhanced learning: Taking memory tests improves long-term retention. Psychological Science, 17, 249-255. Presented by: Karpicke, J. D., & Blunt, J. R. (2011). Retrieval practice produces more learning than elaborative studying with concept mapping. Science, 331, 772-775. Including comments below: -Mintzes, J. J., Canas, A., Coffey, J., Gorman, J., Gurley, L., Hoffman, R., ... & Wandersee, J. H. (2011). Comment on “retrieval practice produces more learning than elaborative studying with concept mapping”. Science, 334, 453-453. -Karpicke, J. D., & Blunt, J. R. (2011). Response to comment on “retrieval practice produces more learning than elaborative studying with concept mapping”. Science, 334, 453-453. Presented by:

Week - Date	Topic	Readings Due
Week 5 - 02-Feb	Malleability of Human Memory	Loftus, E. F., & Pickrell, J. E. (1995). The formation of false memories. Psychiatric Annals, 25, 720-725. Presented by: Wade, K. A., Garry, M., Read, J. D., & Lindsay, D. S. (2002). A picture is worth a thousand lies: Using false photographs to create false childhood memories. Psychonomic Bulletin & Review, 9, 597-603. Presented by:
Week 5 - 04-Feb	Poster Presentations	No Reading
Week 6 - 9-Feb	Poster Presentations	No Reading
Week 6 - 11-Feb	Poster Presentations	No Reading
16-Feb	Reading Week [No Class]	No Reading
18-Feb	Reading Week [No Class]	No Reading
Week 7 - 23-Feb	Thinking about Memory	Patihis, L., Ho, L. Y., Tingen, I. W., Lilienfeld, S. O., & Loftus, E. F. (2014). Are the "memory wars" over? A scientist-practitioner gap in beliefs about repressed memory. Psychological science, 25, 519-530. Presented by:
Week 7 - 25-Feb	Thinking about Memory	Talarico, J.M. & Rubin, D.C. (2003). Confidence, not consistency, characterizes flashbulb memories. Psychological Science, 14, 455–461. Presented by: Castel, A. D., McCabe, D. P., & Roediger, H. L. (2007). Illusions of competence and overestimation of associative memory for identical items: Evidence from judgments of learning. Psychonomic Bulletin & Review, 14, 107-111. Presented by:

Week - Date	Topic	Readings Due
Week 8 - 1- Mar	Working Memory	Farmer, E. W., Berman, J. V., & Fletcher, Y. L. (1986). Evidence for a visuo-spatial scratch-pad in working memory. The Quarterly Journal of Experimental Psychology, 38, 675-688. Presented by: Kane, M. J., Bleckley, M. K., Conway, A. R., & Engle, R. W. (2001). A controlled-attention view of working-memory capacity. Journal of Experimental Psychology: General, 130, 169. Presented by:
Week 8 - 3- Mar	Working Memory	Jaeggi, S. M., Buschkuehl, M., Jonides, J., & Perrig, W. J. (2008). Improving fluid intelligence with training on working memory. Proceedings of the National Academy of Sciences, 105, 6829-6833. Presented by: Harrison, T. L., Shipstead, Z., Hicks, K. L., Hambrick, D. Z., Redick, T. S., & Engle, R. W. (2013). Working memory training may increase working memory capacity but not fluid intelligence. Psychological Science, 24, 2409-2419. Presented by:
Week 9- 8 -Mar	Working Memory	Smith, E. E., & Jonides, J. (1999). Storage and executive processes in the frontal lobes. Science, 283, 1657-1661. Presented by: Fregni, F., Boggio, P. S., Nitsche, M., Bermpohl, F., Antal, A., Feredoes, E., ... & Pascual-Leone, A. (2005). Anodal transcranial direct current stimulation of prefrontal cortex enhances working memory. Experimental brain research, 166, 23-30. Presented by:
Week 9- 10-Mar	Experiment Programming	No Reading
Week 10 -15 -Mar	Experiment Programming	No Reading

Week - Date	Topic	Readings Due
Week 10 - 17-Mar	Experiment Programming	No Reading [in computer lab]
Week 11 - 22-Mar	Distributing Memory Demands	Intons-Peterson, M. J., & Fournier, J. (1986). External and internal memory aids: When and how often do we use them?. Journal of Experimental Psychology: General, 115, 267. Presented by: Schryer, E., & Ross, M. (2013). The use and benefits of external memory aids in older and younger adults. Applied Cognitive Psychology, 27, 663-671. Presented by:
Week 11 - 24-Mar	Distributing Memory Demands	Sparrow, B., Liu, J., & Wegner, D. M. (2011). Google effects on memory: Cognitive consequences of having information at our fingertips. Science, 333, 776-778. Presented by: Storm, B. C., & Stone, S. M. (2015). Saving-enhanced memory the benefits of saving on the learning and remembering of new information. Psychological Science, 26, 182-188. Presented by:
Week 12 - 29-Mar	Data Analysis [in computer lab]	No Reading [in computer lab]
Week 12 - 31-Mar	Data Analysis [in computer lab]	No Reading [in computer lab]

Late Work

Marks will be deducted from assignments submitted late (10% per day late) unless accomodation is agreed to by the instructor.

Students requesting accommodation for course requirements (assignments, midterm tests, final exams, etc.) due to illness should do the following:

• seek medical treatment as soon as possible and obtain a completed uWaterloo Verification of Illness Form: http://uwaterloo.ca/health-services/student-medical-clinic/services/verification-illness

• submit that form to the instructor within 48 hours.

• (preferably) inform the instructor by the due date for the course requirement that you will be unable to meet the deadline and that documentation will be forthcoming.

In the case of a missed final exam, the instructor and student will negotiate an extension for the final exam which will typically be written as soon as possible, but no later than the next offering of the course.

In the case of a missed assignment deadline or midterm test, the instructor will either:
1. waive the course component and re-weight remaining term work as he/she deems fit according to circumstances and the goals of the course, or
2. provide an extension.

In the case of bereavement, the instructor will provide similar accommodations to those for illness. Appropriate documentation to support the request will be required.

Students who are experiencing extenuating circumstances should also inform their academic advisors regarding their personal difficulties.

Electronic Device Policy

Please limit the use of electronic devices in class to course related activities (e.g., taking notes).

Attendance Policy

You are expected to attend all classes. Your attendance will contribute to your participation grade.

Academic Integrity

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo are expected to promote honesty, trust, fairness, respect and responsibility.

Discipline: A student is expected to know what constitutes academic integrity, to avoid committing academic offences, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline.

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70 - Student Petitions and Grievances, Section 4.

Appeals: A student may appeal the finding and/or penalty in a decision made under Policy 70 - Student Petitions and Grievances (other than regarding a petition) or Policy 71 - Student Discipline if a ground for an appeal can be established. Read Policy 72 - Student Appeals.

Other sources of information for students:
Academic Integrity website (Arts)
Academic Integrity Office (UWaterloo)

Accommodation for Students with Disabilities

Note for students with disabilities: The AccessAbility Services office, located on the first floor of the Needles Hall extension (1401), collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the AS office at the beginning of each academic term

Concerns About the Course or Instructor (Informal Stage)

We in the Psychology Department take great pride in the high quality of our program and our instructors. Though infrequent, we know that students occasionally find themselves in situations of conflict with their instructors over course policies or grade assessments. If such a conflict arises, the Associate Chair for Undergraduate Studies (Richard Eibach from July 1, 2015 through June 30, 2016) is available for consultation and to mediate a resolution between the student and instructor. Contact information:

Richard Eibach Email: reibach@uwaterloo.ca; Ph 519-888-4567 ext. 38790

A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. See Policy 70 and 71 below for further details.

Students requesting accommodation for course requirements (assignments, midterm tests, final exams, etc.) due to illness should do the following:

seek medical treatment as soon as possible and obtain a completed uWaterloo Verification of Illness Form

submit that form to the instructor within 48 hours.

(is possible) inform the instructor by the due date for the course requirement that you will be unable to meet the deadline and that documentation will be forthcoming.

In the case of a missed final exam, the instructor and student will negotiate an extension for the final exam which will typically be written as soon as possible, but no later than the next offering of the course.

In the case of a missed assignment deadline, midterm test, or quiz, the instructor will either:

1. waive the course component and re-weight remaining term work as he/she deems fit according to circumstances and the goals of the course, or
2. provide an extension.

In the case of bereavement, the instructor will provide similar accommodations to those for illness. Appropriate documentation to support the request will be required.

Students who are experiencing extenuating circumstances should also inform their academic advisors regarding their personal difficulties.

Official version of the course outline

If there is a discrepancy between the hard copy outline (i.e., if students were provided with a hard copy at the first class) and the outline posted on LEARN, the outline on LEARN will be deemed the official version. Outlines on LEARN may change as instructors develop a course, but they become final as of the first class meeting for the term.