

Western University
Department of Psychology

Fundamental Issues in Cognition—Psychol 9100A
Fall 2022
Tuesday, 1:00pm—4:00pm, WIRB 11XX

1 Enrollment Restrictions

Enrollment in this course is restricted to graduate students in Psychology CDBS stream, as well as any student that has obtained special permission to enroll in this course from the course instructor as well as the Graduate Chair (or equivalent) from the student's home program.

2 Instructor and Teaching Assistant Information

Instructor: John Paul Minda

Office: WIRB 5158

Office Phone: 84689

Office Hours: Tuesday 10:00am—11:00am

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3 Course Description

This course will provide graduate students with exposure to classic and current research in cognitive psychology. We will read and discuss articles on the major topics in the field, including high-level perception, mental representations, categorization, attention, working memory, decision making, language, and thinking. The readings will encompass theoretical approaches, behavioural research, computational modelling, and cognitive neuroscience. Meetings will follow a seminar/debate format, in which students will discuss the readings for each class and will debate the central topic. To frame the discussion for each meeting, the instructor will provide background and any needed tutorials. Marks will be based on participation and written work. This course is limited to 20 students and preference will be given to students in Psychology CDBS.

4 Course Format

In-person seminar

5 Course Learning Outcomes/Objectives

In this course, we will cover several key issues in the development of cognitive psychology. Many classes will focus on a controversy or debate in the field. Our goal is to understand these debates, to understand why these debates are important, and hopefully to understand something about how the mind works. Please be advised that you must read the assigned readings BEFORE class. I (and the discussion leaders) will be asking questions about the

material during the lecture, and you will be expected to be familiar with the main ideas in the readings

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

1. **Describe** key concepts, principles, and overarching themes relevant to cognitive psychology. This outcome will be assessed through class discussion, discussion papers, and the two exams.
2. **Articulate** the concepts and current states of knowledge in both the natural science and social science aspects of cognitive psychology
3. **Engage** in a critical scholarly discussion on a psychological topic using evidence to support claims. This outcome will be assessed through class discussion and debate.
4. **Critically evaluate** the presentation of scientific ideas and research in the popular media. This outcome will be assessed through class discussion, discussion papers, and the two exams.

6 Course Materials

All the course readings will be available on the course website

7 Methods of Evaluation

Each class will be run in one of two possible formats:

7.1 Round Robin Seminar (RRS)

In this format, the class will be a discussion of the central issues in the assigned readings. Prior to each class, students will write a 1-2 page thought paper (see below for more information about the paper) on the central topic, or on one of the papers. During the class each student will be given about 5 minutes to present this paper and to discuss various aspects of the central topic. Other members of the class should interrupt and question. I will moderate and provide commentary as well.

7.2 Debate Team (DT)

Each class is framed around a debate and there will be two teams. Each team consists of a leader and at least two panelists. They will face off and the remaining students will assess and judge the winner and provide feedback. Debate teams should prepare together. I will score each team on a scale of 1-10. These marks will be averaged together and will contribute 10% to the final grade. Details on how we will run the debates will be distributed in class.

7.3 Assignment Schedule

Assignment	Date of Evaluation	Weighting
Thought Papers	Weekly	20%
Debate	Weeks as shown	10%
Midterm Exam	October X	35%
Final Exam	December X	35%
Total		100%

7.4 Thought Papers

Students will complete a 1-2 page, single-spaced thought paper to be submitted via OWL by Monday at 7:00pm, prior to the class. Please upload a PDF file only. A good thought paper will address a key theme in the readings for the week, suggest a new experiment in a particular area, or point out problems with particular theory. The goal of the thought paper is to get you thinking about what you want to discuss. Each thought paper will be graded (0-10). These marks will be averaged together and will contribute 20% to the final grade.

7.5 Midterm Exam

The first exam is a midterm exam that will be worth 35% of the final mark. This will be an in-class, closed-book essay exam given on October 22. You may write on a laptop or paper (electronic copy is preferred). You will have the entire three hours to write the exam, which will be a set of six questions from which you will choose three to answer. Each question on the midterm will be graded on a 0-100 scale in terms of how well you addressed the topic or question. The full grade for the midterm will be the average score for all the questions.

7.6 Final Exam

The final exam is a take-home essay exam that will be worth 35% of the final mark. The questions will be distributed on the final day of class and the answers will be due one week later. Please submit your final paper via OWL. The final exam (inclusive of all questions) has a maximum length of 20 double-spaced pages. Please use a standard font such as Garamond or Palatino, and please upload a PDF file only: no word files, and make sure that your name and student number are in the header. Please do not exceed the 20 page limit. Each question on the final will be graded on a 0-100 scale in terms of how well you addressed the topic or question. Content, form, spelling, grammar, and style all count in this grade. The full grade for the final will be the average score for all the questions.

7.7 Final Grade.

The final grade will be the combination of the midterm (35%), the final (35%), the short papers (20%) and debates (10%).

8 Course Timeline

8.1 Week 1: Sept 13 – Introductory Meeting.

We will discuss an overview of the class and will schedule any presentations and teams.

8.2 Week 2: Sept 20 – Levels of Analysis and the Development of Cognitive Psychology.

This class will be “Round Robin Seminar” (RSS) format. Please be prepared to present your thought paper and to discuss these readings.

- Sperry, R. W. (1993). The impact and promise of the cognitive revolution. *American Psychologist*, 48, 878–885.
- Marr, D., & Poggio, T. (1979). A computational theory of human stereo vision. *Proceedings of the Royal Society of London B*, 204, 301–328.
- Poggio, T. (1981). Marr’s Computational Approach to Vision. *Trends in NeuroSciences*, 14, 258–262.
- Love, B. C. (2015). The Algorithmic Level Is the Bridge Between Computation and Brain. *Topics in Cognitive Science*, 230–242.

8.3 Week 3: Sept 27 – The Impact of Cognitive Neuroscience.

We will run this class in “Debate Team” (DT), and we will have two separate debates. Teams will be assigned on the Week 1 class.

8.3.1 Debate 1: What has functional neuroimaging told us about the mind?

Team 1

- Coltheart, M. (2006b). What has functional neuroimaging told us about the mind (so far)? *Cortex*, 42, 323–331.
- Coltheart, M. (2006a). Perhaps functional neuroimaging has not told us anything about the mind (So Far). *Cortex*, 42, 422–427.
- Page, M. P. A. (2006). What can’t functional neuroimaging tell the cognitive psychologist? *Cortex*, 42, 428–443.

Team 2

- Jonides, J., Nee, D. E., & Berman, M. G. (2006). What has functional neuroimaging told us about the mind? So many examples, so little space. *Cortex*, 42, 414–417.
- Henson, R. (2006). What has (Neuro)Psychology told us About the Mind (so Far)? a Reply to Coltheart (2006). *Cortex*, 42, 387–392.

8.3.2 Debate 2: The Seductive Allure of Neuroscience Explanations

Team 1

- Weisberg, D. S., Keil, F. C., Goodstein, J., Rawson, E., & Gray, J. R. (2008). The Seductive Allure of Neuroscience Explanations. *Journal of Cognitive Neuroscience*, 20, 470–477.

Team 2

- Farah, M. J., & Hook, C. J. (2013). The Seductive Allure of “Seductive Allure.” *Perspectives on Psychological Science*, 8, 88–90.

8.4 Week 4: Oct 4 – Is Vision Strictly Visual? Vision as Action, Evidence from Blind Echolocation, and Visual Imagery. RRS.

- Goodale, M. A., & Milner, A. D. (1992). Separate visual pathways for perception and action. *Trends in NeuroSciences*, 15(1), 20–25.
- Arnott, S. R., Thaler, L., Milne, J., Kish, D., & Goodale, M. A. (2013). Shape-specific activation of occipital cortex in an early blind echolocation expert. *Neuropsychologia*, 1–12.
- Thaler, L., Arnott, S. R., & Goodale, M. A. (2011). Neural Correlates of Natural Human Echolocation in Early and Late Blind Echolocation Experts. *PLoS ONE*, 6(5), e20162.
- Ganis, G. (2004). Brain areas underlying visual mental imagery and visual perception: an fMRI study. *Cognitive Brain Research*, 20, 226–241.

8.5 Week 5: Oct 11. Attention and Lapses in Attention. RRS

- Chun, M. M., Golomb, J. D., & Turk-Browne, N. B. (2011). A Taxonomy of External and Internal Attention. *Annual Review of Psychology*, 62, 73–101.
- Simons, D. J., & Levin, D. T. (1998). Failure to detect changes to people during a real-world interaction. *Psychonomic Bulletin & Review*, 5, 644–649.
- Simons, D. J., & Chabris, C. F. (1999). Gorillas in our midst: Sustained inattention blindness for dynamic events. *Perception*, 28(9), 1059–1074.
- Simons, D. J., & Levin, D. T. (1997). Change blindness. *TRENDS in Cognitive Sciences*, 1(7), 261–267.

8.6 Week 6: Oct 18 – Short Term Memory, Working Memory, and Executive Function. RRS

- Baddeley, A. D. & Hitch, G. J. (1994). Developments in the concept of working memory. *Neuropsychology*, 8, 485–493.
- Baddeley, A. D. (2012) Working Memory: Theories, models, and controversies. *Annual Review of Psychology*, 63, 1–29.
- Oberauer, K. (2009). Design for a working memory. In B. H. Ross (Ed.). *Psychology of Learning and Motivation*, Vol. 52, (pp. 45–100). Burlington, VT: Academic Press.
- Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., & Howerter, A. (2000). The Unity and Diversity of Executive Functions and Their Contributions to Complex “Frontal Lobe” Tasks: A Latent Variable Analysis. *Cognitive Psychology*, 41, 49–100.

8.7 Week 7: Oct 25 —Mid Term Exam, Week 2- Week 6

8.8 Week 8: Nov 1—Reading week

8.9 Week 9: Nov 8 – Memory Systems, RRS

- Craik, F. I. & Tulving, E. (1975). Depth of processing and the retention of words in episodic memory. *Journal of Experimental Psychology: General*, 104, 268-294.
- Tulving, E. (2002). Episodic memory-From brain to mind. *Annual Review of Psychology*, 53, 1–25.
- Squire, L. R., Wixted, J. T., & Clark, R. E. (2007) Recognition memory and the medial temporal lobe: a new perspective, *Nature Reviews Neuroscience*, 8, 872–883.
- Patterson, K., Nestor, P. J., & Rogers, T. T. (2007). Where do you know what you know? The representation of semantic knowledge in the human brain, *Nature Reviews Neuroscience*, 8, 976– 987.

8.10 Week 10: Nov 15 – Categorization: Single or Multiple systems, DT

8.10.1 Team 1

- Ashby, F. G., Paul, E. J., & Maddox, W. T. (2011). COVIS In E. M. Pothos & A. J. Wills (Eds.), *Formal Approaches in Categorization*, (pp. 65–87). Oxford UK: Oxford University Press.
- Minda, J. P., & Miles, S. J. (2010). The Influence of Verbal and Nonverbal Processing on Category Learning. In B. H. Ross (Ed.), *Psychology of Learning and Motivation*, Vol. 52, (pp. 117–162). Burlington, VT: Academic Press.
- Miles, S. J., & Minda, J. P. (2011). The effects of concurrent verbal and visual tasks on category learning. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 37, 588–607.

8.10.2 Team 2

- Newell, B. R. Dunn, J. C., & Kalish, M (2011). Systems of Category Learning: Fact or Fantasy? In B. H. Ross (Ed.), *Psychology of Learning and Motivation*, Vol 54, (pp. 167–215). Burlington, VT: Academic Press.
- Lewandowsky, S., Yang, L.-X., Newell, B. R., & Kalish, M. L. (2012). Working memory does not dissociate between different perceptual categorization tasks. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 38(4), 881–904.

8.11 Week 11: Nov 22 – Inductive Reasoning: Similarity-based or Theory-based? RRS

- Slooman, S. A. & Lagnado, D. A. (2005). The problem of induction. In K. Holyoak and R. Morrison (Eds.), *The Cambridge Handbook of Thinking and Reasoning*, (pp 95–116), Cambridge, UK: Cambridge University Press.
- Osherson, D. N., Smith, E. E., Wilkie, O., Lopez, A., & Shafir, E. (1990). Category-based induction. *Psychological Review*, 97, 185–200.
- Ahn, W.-K., Kalish, C., Gelman, S. A., Medin, D. L., Luhmann, C., Atran, S., et al. (2001). Why essences are essential in the psychology of concepts. *Cognition*, 82, 59–69.
- Gelman, S. A. & Markman, E. M. (1986). Categories and induction in young children. *Cognition*, 23, 183–209.

8.12 Week 12: Nov 29 – Reasoning Systems: Single or Dual (or Neither)? DT.

8.12.1 Team 1

- Evans, J. S. B. T., & Stanovich, K. E. (2013a). Dual-Process Theories of Higher Cognition: Advancing the Debate. *Perspectives on Psychological Science*, 8, 223–241.
- Evans, J. S. B. T., & Stanovich, K. E. (2013b). Theory and Metatheory in the Study of Dual Processing: Reply to Comments. *Perspectives on Psychological Science*, 8, 263–271.

8.12.2 Team 2

- Osman, M. (2013). A Case Study: Dual-Process Theories of Higher Cognition—Commentary on Evans & Stanovich (2013). *Perspectives on Psychological Science*, 8, 248–252.
- Thompson, V. A. (2013). Why It Matters: The Implications of Autonomous Processes for Dual Process Theories—Commentary on Evans & Stanovich (2013). *Perspectives on Psychological Science*, 8, 253–256.

Keren, G. (2013). A Tale of Two Systems: A Scientific Advance or a Theoretical Stone Soup? Commentary on Evans & Stanovich (2013). *Perspectives on Psychological Science*, 8, 257–262.

**8.13 Week 13: Dec 6 —Expertise: Perceptual, Conceptual, and its Development. RRS.
The final exam question will be handed out and are due on Dec 17.**

Chi, M. T. H., Feltovich, P. J., & Glaser, R. (1981). Categorization and representation of physics problems by experts and Novices. *Cognitive Science*, 5, 121-152.

Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The Role of Deliberate Practice in the Acquisition of Expert Performance. *Psychological Review*, 100, 363–406.

Ericsson, K. A. (2006) The influence of experience and deliberate practice on the development of superior expert performance In K. Ericsson, N. Charness, P. Feltovich, & R. Hoffman (Eds.), *The Cambridge Handbook of Expertise and Expert Performance*, (pp 169–184), Cambridge, UK: Cambridge University Press.

Macnamara, B. N., Hambrick, D. Z., & Oswald, F. L. (2014). Deliberate Practice and Performance in Music, Games, Sports, Education, and Professions: A Meta-Analysis. *Psychological Science*, 25(8), 1608–1618.

9 Statement on Academic Offences

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

10 Health/Wellness Services

Students who are in emotional/mental distress should refer to Mental Health@Western <http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help.

11 Accessible Education Western (AEW)

Western is committed to achieving barrier-free accessibility for all its members, including graduate students. As part of this commitment, Western provides a variety of services devoted to promoting, advocating, and accommodating persons with disabilities in their respective graduate program.

Graduate students with disabilities (for example, chronic illnesses, mental health conditions, mobility impairments) are strongly encouraged to register with Accessible Education Western (AEW), a confidential service designed to support graduate and undergraduate students

through their academic program. With the appropriate documentation, the student will work with both AEW and their graduate programs (normally their Graduate Chair and/or Course instructor) to ensure that appropriate academic accommodations to program requirements are arranged. These accommodations include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction.