PSYC58: Cognitive Psychology Laboratory -- Fall 2009

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Class Times and Locations:
        Tuesday: 12-2   BV469
        Thursday: 12-1   BV471

Prerequisites: PSYB01H & [PSYB07H or SOCB06H or STAB22H] & [PSYB51H or PSYB57H]

Course Website: Blackboard (note that course evaluations will be conducted on the intranet)

Course Objectives:

1. To develop a deep understanding of modern methodological techniques used by cognitive psychologists to study the mind.
2. To familiarize students with the computer software required for designing reaction time based cognitive psychology experiments, and running computer simulations of mental phenomena.
3. To provide students with hands on experience collecting, manipulating, and analyzing data, and reporting methods and results in APA format, with the ultimate goal of preparing students to conduct their own professional, research-grade experiments.

Lecture, Reading, & Assignment Schedule

- 10/09/09: Introduction to the Course: Cognitive Psychology Laboratory
- 15/09/09: Introduction to Behavioral Reaction Time Data Collection: Stroop
- 17/09/09: Review (optional): How to clean-up and analyze a simple data set.
- 22/09/09: Introduction to Computerized Data Collection: Stroop
- 24/09/09: Discussion: Stroop Data and Extensions
    - Discuss Assignment 1 Today
- 29/09/09: Introduction to E-Prime
- 01/10/09: Introduction to E-Merge & E-Data-Aid
    - Assignment 1 Due Today

- 06/10/09: How to: Advanced E-Prime Programming & Debugging
- 08/10/09: Review (optional): E-Prime, E-Merge, & E-DataAid
- 13/10/09: How to: Programming Experiments: Category Verification, Priming, and Typicality Effects
- 15/10/09: How to: "Cleaning" your RT and Error data in Excel.
- 20/10/09: How to: Analyzing your data (by hand, SPSS, R, and/or Minitab)
- 22/10/09: Review (optional): Cleaning and analyzing data.
- 27/10/09: Review: You've got your data. Now what?
  - Discuss Assignment 2 Today
- 29/10/09: Introduction to Computer Modeling in Cognitive Psychology
- 03/11/09: Introduction to Connectionist Modeling
  - Assignment 2 Due Today
- 05/11/09: Simulation: The 4-2-4 Encoder Problem and Backpropagation
- 10/11/09: Simulation: The Rumelhart Framework
- 12/11/09: Simulation: Rogers & McClelland (2004)
  - Discuss Assignment 3 Today
- 17/11/09: Review: You've got your simulation data. Now what?
- 19/11/09: Introduction to the Study of Working Memory
  - Assignment 3 Due Today
- 24/11/09: Introduction to fMRI, and Application to the Study of Working Memory
- 26/11/09: Conceptual (Qualitative) Analysis of fMRI Data
- 01/12/09: Course Review and Prep. for Final Exam
- Final Exam (to be scheduled by Registrar during Final Exam Period: Dec. 7-18th)

Readings

No textbook is required for this course. All required readings will be posted on BlackBoard. Please check the weekly lecture notes for suggestions as to when you should read each of the assigned papers/manuals, and for guidance as to the level of depth at which you are expected to understand the various materials.

15/09/09:
- Stroop, J. R. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology, 18,* 643-662.
- MacLeod, C. M. (1991). Half a century of research on the Stroop effect: An integrative review. *Psychological Bulletin, 109*, 163-203.

22/09/09:
- E-Prime Manual (selected chapters)

29/09/09:
- E-Prime Getting Started Guide

06/10/09:
- E-Prime Manual (selected chapters)

13/10/09:
- Collins, A. M., & Quillian, M. R. (1969). Retrieval time from semantic memory. *Journal of Verbal Learning and Verbal Behavior, 8*, 240-248.
- Rosch, E. (1975). Cognitive representations of semantic categories. *Journal of Experimental Psychology: General, 104*, 192-233.
- McRae, K., & Boisvert, S. (1998). Automatic semantic similarity priming. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 24,* 558-572.

29/10/09:
- Collins, A. M., & Loftus, E. F. (1975). A spreading activation theory of semantic memory. *Psychological Review, 82*, 407-428.

03/11/09:
- Hinton, G. E. (1981) Implementing semantic networks in parallel hardware. In Hinton, G. E. & Anderson, J. A. (Eds.), *Parallel Models of Associative Memory*, Erlbaum, Hillsdale, NJ.
- PDP++ Manual (selected chapters)

05/11/09:
- Hinton, G. E. (1992). How neural networks learn from experience. *Scientific American. September, 1992*.
- Rumelhart, D. E., & Todd, P. M. (1993). Learning and connectionist representations. In D.E. Meyer and S. Kornblum (Eds.), *Attention and performance XIV* (pp. 3-30).

19/11/09:
- Curtis, C. E., & D'Esposito, M. (2006). Functional neuroimaging of working memory. In R. Cabeza & A. Kingstone [Eds.]. *Handbook of Functional Neuroimaging of Cognition, 2nd Edition*. Bradford Books, MIT Press. (http://cognet.mit.edu/library/erefs/cabeza/)
- Chein, J.M. & Fiez, J.A. (2001). Dissociation of verbal working memory system components using a delayed serial recall task. *Cerebral Cortex , 11 (11)*, 1003-1014.
- Song, A. W., Huettel, S. A., & McCarthy, G. (2006). Functional Neuroimaging: Basic principles of functional fMRI. In R. Cabeza & A. Kingstone [Eds.]. *Handbook of Functional Neuroimaging of Cognition, 2nd Edition*. Bradford Books, MIT Press. (http://cognet.mit.edu/library/erefs/cabeza/)

Course Evaluation

Assignment 1: Research Proposal   15%
Assignment 2: APA Method Section   20%
Assignment 3: APA Results Section   15%
Final Exam   40%
Class Participation   10%

Late Assignments

A penalty of 5% will be deducted for each calendar day that an assignment is late. I do not have jurisdiction to extend deadlines for assignments beyond the last day of classes, so be sure to submit all materials by that time. If necessary, students may petition the Registrar's office for permission to submit assignments after the last day of classes. Such petitions are not automatically granted, and indeed, will likely be denied without a valid reason. Such petitions must be submitted by the last day of the final examination period of the term.

Other Important Information

The University of Toronto is dedicated to fostering an academic community in which the learning and scholarship of every member may flourish, with vigilant protection for individual human rights, and a resolute commitment to the principles of equal opportunity, equity and justice.

AccessAbility
Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible. I will work with you and AccessAbility Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC AccessAbility Services staff (located in S302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or ability@utsc.utoronto.ca.

Academic Integrity
Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:
  - o **Papers and Assignments:** Using someone else's ideas or words without appropriate acknowledgement. Submitting your own work in more than one course without the

permission of the instructor. Making up sources or facts. Obtaining or providing unauthorized assistance on any assignment.

- o **Tests and Exams:** Using or possessing unauthorized aids. Looking at someone else's answers during an exam or test. Misrepresenting your identity.
- o **Other Academic Work:** Falsifying institutional documents or grades. Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see: http://www.utoronto.ca/academicintegrity/resourcesforstudents.html).

H1N1 Planning

Students are advised to consult the university's preparedness site (http://www.preparedness.utoronto.ca) for information and regular updates regarding procedures relating to H1N1 planning and individual student responsibilities.

The above schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances.