Psychology
UNIVERSITY OF TORONTO
SCARBOROUGH

PSYD50H3S: Current Topics in Memory and Cognition
Winter 2014

Class meeting time: Monday 13:00-15:00, Room BV 363
Instructor: Dr. Adrian Nestor
Office hours: Thursday 14-16 pm
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(*Please put PSYD50 in the subject line of any e-mails)

1. GENERAL COURSE INFORMATION

Calendar description: an intensive examination of selected topics; the specific content will vary from year to year.

Prerequisite: PSYB57H3 plus one C-level half-credit in PSY

Exclusions: PSY470H, PSY471H

Online resources: Blackboard and Peer Scholar (Blackboard-based access)

Course reading: research/review articles in the field (no textbook will be required)

2. COURSE DESCRIPTION

Recognizing an object, reading a word or identifying a face are highly complex perceptual processes, which we seem to master with relatively little effort. Hence, the neural mechanisms supporting such abilities have been the target of considerable research efforts within the cognitive psychology and neuroscience community. This course will introduce students to seminal theories, results and research methods in the study of these abilities and of their neural basis.

Much of the research discussed in this course relies on one brain-imaging modality in particular, functional magnetic resonance imaging (fMRI), both because of its wide applicability and because of its current prominence in cognitive neuroscience. However, additional methods pertaining to the study of visual impairments, computational modeling, neurophysiology etc. will provide critical evidence to the theories discussed.

The broad goals of the course [along with their main methods of assessment] consist in:

- Extending breadth of knowledge in cognitive psychology/neuroscience, including theoretical perspectives, research findings, and applications [assessed through writing assignments and in-class discussions]
- Fostering familiarity with diverse research paradigms [assessed through writing assignments and in-class discussions].

- Engendering the ability to assess and critique research articles/presentations [assessed through Peer Scholar, writing assignments and in-class discussions].
- Improve skill in oral and written presentation [through writing assignments and article presentation].
- Fostering critical thinking and creativity [assessed through writing assignments, in-class discussions, and final paper].

Class discussions and presentations of research in these areas will be guided by general issues such as:

a) What is the research hypothesis/goal of a given study?
b) What is the significance/relevance of a particular hypothesis/theory within a broader research context (i.e., why does it matter?)
c) What empirical/computational methods are critical to each study?
d) What are the main strengths and weaknesses of a given study?
e) How well are the conclusions of a study justified by its findings?
f) What potential findings would confirm or disprove a given conclusion (i.e., how would you redesign or follow up on a particular study?)

Of note, cognitive neuroscience/psychology is a rapidly evolving scientific discipline. The wealth and the constant influx of novel empirical findings is a challenge for any attempts at a comprehensive theoretical account. In addition, the research process is prone to bias, misconception and, occasionally, to error. Approaching this research with a critical mind, with logical rigor and with justified skepticism is key to understanding the value, the significance and the future promise of this discipline.

3. CLASS SCHEDULE

Week 1 (January 6): Introduction to the course; Introduction to brain anatomy and research methods (neuroimaging, neurophysiology etc.)
Week 2 (January 13): Object recognition; class discussion
Week 3 (January 20): Presentations and class discussion on object recognition
Week 4 (January 27): Face recognition; class discussion
Week 5 (February 3): Presentations and class discussion on face recognition
Week 6 (February 10): Visual word recognition; class discussion
February 17: NO CLASS (Reading week)
Week 7 (February 24): Presentations and class discussion on visual word recognition
Week 8 (March 3): Scene perception; class discussion
Week 9 (March 10): Presentations and class discussion on scene recognition
Week 10 (March 17): Visual cortical organization; class discussion
Week 11 (March 24): Presentations and class discussion on visual cortical organization
Week 12 (March 31): Visual imagery; class discussion

4. REQUIRED READINGS

January 13: Object Processing

a) Grill-Spector K, Malach R (2004) The human visual cortex. Annu Rev Neurosci 27:649-677.

http://www.annualreviews.org.myaccess.library.utoronto.ca/doi/pdf/10.1146/annurev.neuro.27.070203.144220

b) Kourtzi Z, Kanwisher N (2001) Representation of perceived object shape by the human lateral occipital complex. Science. 293:1506-1509.

http://search.proquest.com.myaccess.library.utoronto.ca/docview/213566691

January 27: Face Processing

a) Kanwisher, N., McDermott, J., & Chun, M.M. (1997). The fusiform face area: a module in human extrastriate cortex specialized for face perception. *The Journal of Neuroscience, 17*, 4302 – 4311.

http://www.jneurosci.org.myaccess.library.utoronto.ca/content/17/11/4302.full

b) Haxby, J.V., Gobbini, M.I., Furey, M.L., Ishai, A., Schouten, J.L., & Pietrini, P. (2001). Distributed and overlapping representations of faces and objects in ventral temporal cortex. *Science, 293*, 2425 – 2430.

http://search.proquest.com.myaccess.library.utoronto.ca/docview/213580552

c) (optional) Gauthier, I., Skudlarski, P., Gore, J.C., & Anderson, A.W. (2000). Expertise for cars and birds recruits brain areas involved in face recognition. *Nature Neuroscience, 3*, 191 – 197.

http://search.proquest.com.myaccess.library.utoronto.ca/docview/274779927

February 10: Visual word recognition

a) Dehaene S, Cohen L (2011) The unique role of the visual word form area in reading. Trends Cogn Sci 15:254-262

http://journals2.scholarsportal.info.myaccess.library.utoronto.ca/tmp/11806369643720026102.pdf

b) Price CJ, Devlin JT (2011) The Interactive account of ventral occipitotemporal contributions to reading. Trends Cogn Sci 15:246-253

http://journals2.scholarsportal.info.myaccess.library.utoronto.ca/tmp/18410182310110849266.pdf

c) (optional) Nestor A, Behrmann M, Plaut DC (2013) The neural basis of visual word form processing: a multivariate investigation. Cereb Cortex 23:1673-1684

http://journals2.scholarsportal.info.myaccess.library.utoronto.ca/tmp/8874630164326402437.pdf

March 3: Scene Processing

a) Epstein, R., & Kanwisher, N. (1998). A cortical representation of the local visual environment. Nature*, 392*, 598 – 601.

http://search.proquest.com.myaccess.library.utoronto.ca/docview/204482028

b) MacEvoy SP, Epstein RA (2011) Constructing scenes from objects in human occipitotemporal cortex. Nat Neurosci 14:1323-1329

http://go.galegroup.com.myaccess.library.utoronto.ca/ps/i.do?id=GALE|A269028735&v=2.1&u=utoronto_main&it=r&p=AONE&sw=w

c) (optional) Kravitz DJ, Peng CS, Baker CI (2011) Real-world scene representations in high-level visual cortex: it's the spaces more than the places. J Neurosci 31:7322-7333.

http://www.jneurosci.org.myaccess.library.utoronto.ca/content/31/20/7322.full?sid=508a3430-c0fe-427b-bda9-70ccc8007141

March 17: Visual Cortical Organization

a) Kanwisher N (2010) Functional specificity in the human brain: a window into the functional architecture of the mind. Proc Natl Acad Sci U S A 107:11163-11170.

http://www.jstor.org.myaccess.library.utoronto.ca/stable/20724039

b) Behrmann M, Plaut DC (2013) Distributed circuits, not circumscribed centers, mediate visual recognition. Trends Cogn Sci 17:210-219

http://journals2.scholarsportal.info.myaccess.library.utoronto.ca/tmp/8795812634482994353.pdf

c) (optional) Levy I, Hasson U, Avidan G, Hendler T, Malach R (2001) Center-periphery organization of human object areas. Nat Neurosci 4:533-539.

http://search.proquest.com.myaccess.library.utoronto.ca/docview/274718446

March 24: Visual imagery

a) O'Craven KM, Kanwisher N (2000) Mental imagery of faces and places activates corresponding stiimulus-specific brain regions. J Cogn Neurosci 12:1013-1023.

http://www.mitpressjournals.org.myaccess.library.utoronto.ca/doi/pdf/10.1162/089892900051137549

b) Horikawa T, Tamaki M, Miyawaki Y, Kamitani Y (2013) Neural decoding of visual imagery during sleep. Science. 340: 639-642

http://www.sciencemag.org.myaccess.library.utoronto.ca/content/340/6132/639.full

5.0 EVALUATION

Critique of required readings: 10%
Class participation: 10%
Class presentation: 20%
Peer assessment: 20%
Final term paper: 40%

Critique of required readings (10%)

Each time a new research topic is introduced (weeks 2, 4, 6, 8, 10, 12), you are expected to come to class having read the required readings for that particular topic. On each of these occasions, you must also submit at the beginning of the class a critique of the required readings. This critique should present concisely (400-600 words), in point form, issues, questions and observations that arose for you as you worked through the readings. This critique should emphasize the strengths and, in particular, the limitations of the work described in those readings -- you can use the questions listed above in

'Course description' as general guidelines in evaluating a study). You should bring an additional copy of your assignment to class to use when taking part in the in-class discussions following each lecture.

All assigned readings are available as downloadable files from links in the Syllabus above. The syllabus also contains some optional readings (in parentheses and preceded by 'optional'). Optional readings are made available in case you want to learn about a particular topic in more depth – students who are presenting a given topic should at least familiarize themselves with any optional readings for that topic.

Class Participation (10%)

You are expected to participate actively in class (e.g., by contributing new ideas, by asking questions, by answering questions). Failure to engage in class discussions will result in losing a percentage of your final grade.

Class Presentation (20%)

You will be required to give one presentation in class using presentation software like PowerPoint or Keynote. This presentation should summarize and evaluate a research article relevant for the current topic of discussion. Your presentation should cover the most important points in the article along with your critical assessment of the article – this assessment can follow the same approach used for the purpose of critique assignments. Each presentation should be about 12-15 minutes in length and will be followed by in-class discussion.

You are required to obtain the instructor's approval for your selected article at least 4 days in advance. This can be done by emailing the instructor with a link to your article, or by emailing the article as a .PDF attachment.

On the second week of class I will solicit volunteers for presentations for each research topic. If we cannot fill all of the available slots, I will randomly assign students to present on a particular research topic. Once you have selected your research topic, you will need to conduct a literature search to find an original research article (i.e. not one of the articles we discussed in class) to present to the class.

The day before your presentation (or, preferably, earlier) you are required to submit, via Peer Scholar, an almost-complete draft of your slides. This draft should give your fellow students a sense of what your presentation will cover. More importantly, these materials will be used for the peer assessment component of the course (see below).

Peer Assessment (20%)

You will be required to evaluate, via Peer Scholar, other students' presentations (but you will not be giving them a grade). This evaluation should be based on the materials that presenters submit online as well as on the presentation itself. Please keep these evaluations limited to one short paragraph, and be sure to include both positive comments about the strengths of the presentation, and constructive feedback on what could use further improvement. The evaluation is due within 4 days after each presentation (i.e., by Friday of that week).

The goal of this peer assessment is to ensure that students have ample opportunity to learn from their presentation and, subsequently, to improve upon their presentation skills. Since, as a student in this course, you will be evaluating other student presentations while other students will be evaluating your presentation, please provide the type of feedback that you yourself would like to receive. Your peer assessment grade will be based on all of the assessments that you submit to Peer Scholar.

Last, you are not required to provide peer assessment to the students who are presenting on the same day as you.

Final term paper (40%)

You will submit a final term paper (about 2000 words) by the last day of classes (March 31). This paper should pick a topic of interest in the field of cognitive neuroscience, identify a theoretical position and defend it, to the best of your abilities. You can use the articles we discussed in class as references, but you are expected to include at least as many new as old articles in the reference list of your paper.

You must submit both a hard copy to the instructor, and an electronic copy to the instructor's email account before the deadline. Topics must be approved by the instructor before the beginning of Week 10. Approval should be obtained through email (please email a short statement of your thesis and topic, no longer than 100 words, for approval).

6.0 COURSE POLICIES

Late assignments

A penalty of 10% will be deducted for each 24-hour period that an assignment is late. Extensions will only be granted with proper documentation (i.e. UTSC medical certificate).

Please note that, according to UTSC policy, I am not permitted to extend the deadline for any assignment past 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 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.

Contesting a grade

All requests for a re-grade must be submitted **in writing** within two weeks of the day that the grade is posted. Only requests based on adequate written justification regarding an error in the original grading will be considered. Arbitrary requests for grade increases (e.g., 'I need to get into grad school') will be dismissed.

Please note that a legitimate request will entail a re-grading of the entire assignment. Hence, your grade may be raised, lowered or left intact.

Video and auditory recording

For reasons of privacy and protection of copyright, unauthorized video/audio recording in classrooms is prohibited. This is outlined in the Provost's *Guidelines on Appropriate Use Of Information And Communication Technology*. Note, however, that these guidelines include the provision that students may obtain consent to record lectures (e.g., in the case of private use by students with disabilities).

7.0 OTHER INFORMATION

Academic integrity

UTSC aims to ensure that a degree from the University of Toronto reflects clearly and adequately each student's academic achievement. As a result, the University takes issues of academic integrity very seriously. The Code of Behaviour on Academic Matters (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm) outlines behaviors that constitute academic dishonesty and the process for addressing academic offences.

Potential offences include, but are not limited to:

- Using someone else's ideas or words without appropriate acknowledgement.
- Making up sources or facts.
- Obtaining or providing unauthorized assistance on any assignment.
- Looking at someone else's answers during an exam or test.
- Misrepresenting your identity.
- Falsifying institutional documents or grades.
- Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

If you have questions or concerns about what constitutes appropriate academic behavior 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 (http://www.utoronto.ca/academicintegrity/resourcesforstudents.html).

Please note that the final term paper may be submitted for textual similarity review using commercial plagiarism detection software under license to the University (http://www.turnitin.com). All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of future papers submitted to the system.

AccessAbility

Students with any type of disability/health consideration that may require specific accommodations are encouraged to contact the AccessAbility Services Office as soon as possible. After you have provided the appropriate documentation, the staff in this office will assess your needs and will determine appropriate and reasonable accommodations. All enquiries and information that Access*Ability* Services collects from students about their disabilities will be kept in strict confidence.

The UTSC AccessAbility Services (S302, 416-287-7560, ability@utsc.utoronto.ca) are available by appointment to assess specific needs, to provide referrals and to arrange appropriate accommodations.

For your health

The Health and Wellness Centre (http://www.utsc.utoronto.ca/wellness; SL270, 416-287-7065) provides diagnostic, treatment and referral services for medical and psychological illnesses as well as for health promotion. The professional staff of physicians, nurses and counselors provides personal advice and assistance with family issues, eating disorders, depression, stress, drug and alcohol abuse, relationship issues, a positive space for gender/sexuality issues, and more.

Help with writing

If you do not feel comfortable with your writing abilities or if you intend to improve on them, the following resources are available to you:

The Centre for Teaching and Learning (http://ctl.utsc.utoronto.ca/twc/) offers students one-to-one appointments and supplementary materials to help improve upon their writing skills.

The English Language Development Centre (http://ctl.utsc.utoronto.ca/eld/) offers support and specialized writing programs for students who do not speak English as their primary language.

Additional advice on academic writing can be found at: http://www.writing.utoronto.ca/advice

Literature searches

Students are encouraged to use the following resources when conducting literature searches to identify relevant articles for their presentations and for their final term papers:

The UTSC Library (http://www.library.utoronto.ca/utsc/)
Google Scholar (http://scholar.google.ca/)
PubMed (http://www.ncbi.nlm.nih.gov/pubmed)
PsychINFO (http://www.apa.org/pubs/databases/psycinfo/index.aspx)