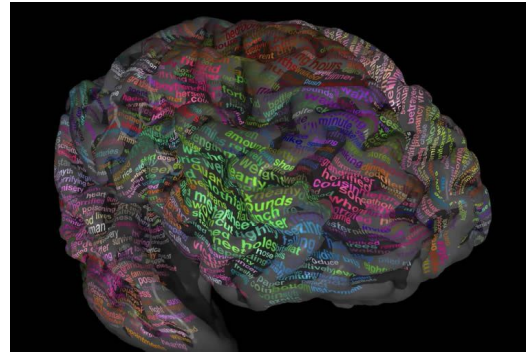# PSYD50: Current Topics in Memory and Cognition

Semantic Memory

University of Toronto Scarborough
Winter Term, 2020
Tuesdays: 1:00pm – 3:00 pm
SW316

Instructor: Prof. George S. Cree
Email: george.cree@utoronto.ca
Office: SW408A
Office Hours: Thursday 1-3 (or by appointment)

About Your Instructor:

Dr. George Cree is an Associate Professor in the Department of Psychology at UTSC. He joined the department in 2003, and was Chair of the department from 2012-2018. He studies semantic memory, with a special interest in neural network models of word meaning computation. More generally, he is interested in knowledge representation, neural network modeling, and artificial intelligence.

About the Course:

This course will focus on semantic memory, your general storehouse of knowledge about the world. We will examine the nature of semantic memory, looking closely at how knowledge is acquired in infancy, how it's computed in the adult brain, and why it often breaks down in predictable patterns in cases of brain injury and disease. We'll consider evidence from behavioral experiments, brain imaging studies, and case reports of patients, with the goal of trying to uncover the data for which any acceptable model of semantic memory must be able to account.

Learning Goals

Upon successful completion of this course you will have developed an understanding of what semantic memory is and how it differs from other memory 'systems', how semantic knowledge is acquired, where and how it is stored in the brain, and when and how it is computed in the service of cognition. You will have a solid foundational grasp of current trends in semantic memory research, and an appreciation for the breadth and depth of current research topics in the field. You will have practiced analyzing and critiquing primary research articles, and will have used the knowledge and skills gained to articulate your own unique perspective on what is required for a successful model of semantic memory, both in terms of the behavioral phenomena that must be accounted for, and the computational specificity required to push forward our understanding of cognition. You will have practiced presenting your thoughts clearly

and succinctly to colleagues in both oral and written form, and through individually tailored feedback, and subsequent revision, will have worked to improve your scientific communication skills in multiple modalities.

Course Topics, Readings, & Assignments

Recommended Background Reading and Review Articles:

1. (Yee, Jones, & McRae, 2017) - general introduction to semantic memory
2. (Rogers & McClelland, 2008) - a summary of their book "Semantic Cognition"
3. (Cree & Armstrong, 2012) - review of models of semantic memory
4. (Jones, Willits, Dennis, & Jones, 2015) - review of models of semantic memory
5. (Martin, 2016) - review of fMRI research on semantic memory
6. (Nastase & Haxby, 2017) - review of fMRI research on semantic memory
7. (Forde & Humphreys, 1999) - review of category-specific semantic deficits
8. (Capitani, Laiacona, Mahon, & Caramazza, 2010) - advanced review of category-specific semantic deficits
9. (Pereira, Gershman, Ritter, & Botvinick, 2016) - advanced review of distributional models of semantic memory

Week 01: Introduction (Jan 7th, 2020)

Required Reading for Week 02: (Caramazza & Mahon, 2003) & (Tyler & Moss, 2001)
Homework: Question Sheet 1 (Due beginning of class week 02)

Week 02: Classic Theories of Semantic Memory: Hierarchical Network Theory (Jan 14th, 2020)

Required Reading for Week 03: (Collins & Quillian, 1969)
Homework: Question Sheet 2 (Due beginning of class week 03)

Week 03: Neural Network Models I: Semantic Cognition & Development (Jan 21, 2020)

Required Reading for Week 04: (McClelland & Rogers, 2003)
Homework: Question Sheet 3 (Due beginning of class week 04)

Week 04: Neural Network Models II: Attractor Networks (Jan 28, 2020)

Required Reading for Week 05: (Hinton, Plaut, & Shallice, 1993)
Homework: Question Sheet 4 (Due beginning of class week 05)

Week 05: Behavioral Data: Feature Norms (Feb 4, 2020)

Required Reading for Week 06: (Cree & McRae, 2003)
Homework: Question Sheet 5 (Due beginning of class week 06)

Week 06: Behavioral Data & Neural Network Models: Semantic Priming (Feb 11, 2020)

Required Reading for Week 07: (McRae & Boisvert, 1998)
Homework: Question Sheet 6 (Due beginning of class week 07)

*** Reading Week (Feb 17-21, 2020) ***

Week 07: Behavioral Data & Neural Network Models: Feature Verification (Feb 25, 2020)

Required Reading for Week 08: (Cree, McNorgan, & McRae, 2006)
Homework: Question Sheet 7 (Due beginning of class week 08)

Week 08: Distributional Models of Semantics: Latent Semantic Analysis (Mar 3, 2020)

Required Reading for Week 09: (Landauer & Dumais, 1997)
Homework: Question Sheet 8 (Due beginning of class week 09)

Week 09: Neuroimaging: fMRI and Semantic Tiling (Mar 10, 2020)

Required Reading for Week 10: (Huth, Heer, Griffiths, Theunissen, & Gallant, 2016) & (Barsalou, 2017)
Homework: Question Sheet 9 (Due beginning of class week 10)

Week 10: Patient Data: Category-Specific Semantic Deficits (Mar 17, 2020)

Required Reading for Week 11: (Hillis & Caramazza, 1991)
Homework: Question Sheet 10 (Due beginning of class week 11)

Week 11: Theories of Semantic Organization (Mar 24, 2020)

Required Reading for Week 12: (Caramazza & Mahon, 2006) & (L. K. Tyler, Moss, Durrant-Peatfield, & Levy, 2000) & (Lambon Ralph et al., 2017)

Week 12: Debate: Which Theory of Semantic Memory is Most Convincing? Why? (Mar 31, 2020)

*** Final Term Paper Due Last Day of Classes (Apr 3, 2020, by 11:59 pm) ***

*** Final Exam Scheduled During Final Exam Period (Apr 8 - 30, 2020) ***

Course Webpage

Materials for the course can be found on Quercus, the University of Toronto's Learning Management System. This is the place to look for course related materials, including announcements, readings, lecture notes, grades, and the discussion board. You should check the course page regularly to ensure that you do not miss any important information. I will try my best to have all lecture related notes posted by 11:59 pm the night before each lecture. These lecture notes will include course announcements, notes on the articles under discussion, connections to the review articles, the homework questions, and pointers to other suggested readings for those that are interested.

Course Requirements and Grading

Discussion Leader	05%	(discussion leader in 1 of weeks 3-12)
Participation	05%	(in class and on discussion board)
Homework Question Sheets	20%	(best 8 of 10; 2.5% each)
Final Term Paper	35%	(due last day of classes Apr 3, 2020)
Final Exam (3 hrs)	35%	(during final exam period Apr 8-30, 2020)

*** Note 1: Students may twice hand in a draft of their final term paper, _instead of_ their Homework Question Sheet answers for that week, for review and comments. It is highly recommended that students take advantage of this opportunity to get feedback on their term paper before final submission, even if it is just a partial draft. A grade out of 2.5% will be assigned to the draft. ***

*** Note 2: Students may twice hand in a corrected version of a previous Homework Question Sheet for re-grading. The original submission with my comments must be attached to the submission to be eligible for re-grading. It is expected that students will have made a serious attempt to address any comments and corrections provided on the first submission. The mark assigned to the second submission will stand as the grade for that assignment. ***

Course Policies

UTSC Department of Psychology Missed Term Work Policy

Missed Term Work due to Medical Illness or Other Emergency:

All students citing a documented reason for missed term work must submit their request for

accommodations **within three (3) business days** of the deadline for the missed work.

Students must submit **BOTH** of the following:
(1.)   A completed **Request for Missed Term Work Accommodations form** (http://uoft.me/PSY-MTW), and
(2.)   **Appropriate documentation** to verify your illness or emergency, as described below.

Appropriate documentation:

For missed **TERM TESTS** due to **ILLNESS**:
·   Submit the Request for Missed Term Work Accommodations form (http://uoft.me/PSY-MTW), along with an **original** copy of the official UTSC Verification of Illness Form (uoft.me/UTSC-Verification-Of-Illness-Form) or an **original** copy of the record of visitation to a hospital emergency room.   Forms are to be completed in full, clearly indicating the start date, anticipated end date, and severity of illness. The physician's registration number and business stamp are required.
·   Note: If an end date of "ongoing" is specified, the medical note will be assumed to cover a period of two weeks. If no end date / an "unknown" end date is specified, the note will be assumed to cover a period of three business days (starting from illness start date.)

For missed **TERM TESTS** due to **ACCESSABILITY REASONS**:
·   Meet with your **AccessAbility consultant** and have them email Keely (keely.hicks@utoronto.ca) detailing the accommodations required.

For missed **ASSIGNMENTS** due to **ILLNESS**:
·   Submit the Request for Missed Term Work Accommodations form (http://uoft.me/PSY-MTW), along with a **hardcopy** of the Self-Declaration of Student Illness Form (uoft.me/PSY-self-declare-form).

For missed **ASSIGNMENTS** due to **ACCESSABILITY REASONS**:
·   If your desired accommodation is **within the scope** of your Accommodation Letter (ex. your letter includes "extensions of up to 7 days" and you need 3 days), submit the Request for Missed Term Work Accommodations form (http://uoft.me/PSY-MTW) and attach a copy of your letter. **Specify how many days extension you are requesting** on the request form.
·   If your desired accommodation is **outside the scope** of your Accommodation Letter (ex. your letter includes "extensions of up to 7 days" but you need more time than that) you will need to meet with your **AccessAbility consultant** and have them email Keely (keely.hicks@utoronto.ca) detailing the accommodations required.

For missed term tests or assignments in **OTHER CIRCUMSTANCES**:
          Submit the Request for Missed Term Work Accommodations form (http://uoft.me/PSY-MTW), along with:
·   In the case of a **death of a family member or friend**, please provide a copy of a death certificate.
·   For U of T varsity-level or professional **athletic commitments**, an email from your coach or varsity administrator should be sent directly to Keely Hicks (keely.hicks@utoronto.ca) **well in advance** of the missed work, detailing the dates and nature of the commitment.
·   For **religious accommodations**, please email (keely.hicks@utoronto.ca) **well in advance** of the missed work.
·   For circumstances **outside of these guidelines**, please email Keely

(keely.hicks@utoronto.ca) on or before the date of the test / assignment deadline to describe your circumstances and ask what documentation would be appropriate

Documents covering the following situations are NOT acceptable: medical prescriptions, personal travel, weddings/personal/work commitments.

Procedure:
Submit your (1.) request form and (2.) medical/self-declaration/other documents in person **WITHIN 3 BUSINESS DAYS** of the missed term test or assignment.
Submit to: Keely Hicks, Room SW420B, Monday – Friday, 9 AM – 4 PM. (Slide forms under door if out of office.)
After submitting your documentation, within approximately one to five business days, you will receive a response from your instructor detailing the accommodations to be made (if any).
You are responsible for checking your official U of T email and Quercus course announcements daily, as accommodations may be time-critical.
You should continue to work on your assignments to the best of your ability, as extension accommodations may be as short as one business day, depending on the nature of the illness/emergency.
If an accommodation has been granted but you are unable to meet the conditions of the accommodation (ex. you need a longer extension, or you missed a make-up test), you will need to repeat the missed term work procedure and submit additional forms to request further accommodation. Note that in the case of a missed make-up test, an opportunity to write a second make-up test may not be provided.
Completion of this form does NOT guarantee that accommodations will be made. The course instructor reserves the right to decide what accommodations (if any) will be made. Failure to adhere to any aspect of this policy may result in a denial of your request for accommodation.

Missed Accommodations
If an accommodation is granted but a continued illness/emergency prevents you from meeting the requirements of your accommodation, you must repeat the missed term work procedure to request additional accommodations.
(E.g.) If you miss a make-up midterm, you would need to submit another Request for Missed Term Work Accommodations form. If your original medical note / documentation included the date of the make-up midterm, then only the Request form is required. If the date of the make-up midterm fell outside of the dates indicated on your original medical note/other documentation, then a new medical note/other appropriate documentation must also be submitted.

Importance of Three Business Day window:
If you are unable to submit your documents in-person within the three business day window**, you must email Keely** (keely.hicks@utoronto.ca) **within the three business day window** to explain when you will be able to bring your documents in person. Exceptions to the documentation deadline will only be made under **exceptional circumstances**. Attach scans of your documentation, and be prepared to bring your documents to Keely in-person as soon as you are well. Late documents may not be accepted.

NOTE: Assignments due at end of term
Instructors cannot accept term work any later than five business days after the last day of class**.** Beyond this date, you would need to file a petition with the Registrar's Office

(https://www.utsc.utoronto.ca/registrar/term-work).

NOTE: Final Exams
This policy applies only to missed assignments and term tests. Missed final exams are handled by the Registrar's Office (http://www.utsc.utoronto.ca/registrar/missing-examination).

Late/Missed Assignments/Papers

Homework assignments will not be accepted late in this course (unless appropriate medical accommodation is granted by the department, as described above).

Final Term Papers can only be accepted up to 5 days after the last day of classes. This year, the last day of classes is April 3, 2020, which means that I cannot accept term papers after 11:59 pm, April 8, 2020. A penalty of 5% per day will be deducted for late submission.

If you wish to submit a term paper after that date you will need to complete a petition through the UTSC Registrar's office.

Accommodation for Personal Reasons

There may be times when you are unable to complete coursework on time due to non-medical reasons. If you have concerns, speak to me as soon as possible, to help you develop a plan. It is also a very good idea to speak with an academic advisor.

Religious Accommodations

The University has a commitment concerning accommodation for religious observances. I will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities on religious holy days not captured by statutory holidays. According to University Policy, if you anticipate being absent from class or missing a major course activity due to a religious observance, please let me know as early in the course as possible, and with sufficient notice (at least two to three weeks), so that we can work together to make alternate arrangements.

Academic Integrity

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 in papers and assignments include 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, and obtaining or providing

unauthorized assistance on any assignment.

On tests and exams cheating includes using or possessing unauthorized aids, looking at someone else's answers during an exam or test, misrepresenting your identity, or falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

Make-Up Assignments

There will be no opportunity for make-up assignments in this course. This applies primarily to the Discussion Leader component of the assessment. If you miss the class in which you are assigned to lead the class discussion you will receive a grade of 0 for that assignment. If you have valid medical documentation for missing the class, or have otherwise received permission from the instructor, then that portion of the final grade will be assigned to the Final Paper (i.e., the Final Paper will be worth 40% of your final grade, as opposed to 35%). There will be no opportunity to submit late Homework Assignments (unless the Department has given permission due to a medical issue).

Disability-Related Accommodation Requirement

To learn more about accommodations, see:

Demystifying Academic Accommodations:

http://www.viceprovoststudents.utoronto.ca/Assets/Students+Digital+Assets/Demystifying+Academic+Accommodations.pdf

What Faculty Need to Know about Accommodating Students with Disabilities:

http://www.viceprovoststudents.utoronto.ca/Assets/Students+Digital+Assets/What+faculty+need+to+know+about+accommodating+students.pdf

AccessAbility Services UTSC: http://www.utsc.utoronto.ca/ability/

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.

AccessAbility Services staff (located in Rm SW302, Science Wing) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations. Please contact 416-287-7560 (tel/TTY) or email ability@utsc.utoronto.ca for more information.

The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

Quercus Info

This course uses the University's learning management system, Quercus, to post information

about the course. This includes posting readings and other materials required to complete class activities and course assignments, as well as sharing important announcements and updates. The site is dynamic and new information and resources will be posted regularly as we move through the term, so please make it a habit to log in to the site on a regular, even daily, basis. To access the course website, go to the U of T Quercus log-in page at https://q.utoronto.ca. Once you have logged in to Quercus using your UTORid and password, you should see the link or "card" for PSYD50. You may need to scroll through other cards to find this. Click on the PSYD50 link to open our course area, view the latest announcements and access your course resources. There are Quercus help guides for students that you can access by clicking on the "?" icon in the left side column.

SPECIAL NOTE ABOUT GRADES POSTED ONLINE: Please also note that any grades posted are for your information only, so you can view and track your progress through the course. No grades are considered official, including any posted in Quercus at any point in the term, until they have been formally approved and posted on ACORN at the end of the course. Please contact me as soon as possible if you think there is an error in any grade posted on Quercus.

Online Communication

You are required to use your utoronto email address for all course-related communications, and are expected to check this email address regularly throughout the course to ensure timely access to important information. I will only respond to emails received from a utoronto account, as this is the only way I can verify who I am talking with.

Harassment/Discrimination

The University of Toronto is a richly diverse community and as such is committed to providing an environment free of any form of harassment, misconduct, or discrimination. In this course, I seek to foster a civil, respectful, and open-minded climate in which we can all work together to develop a better understanding of key questions and debates through meaningful dialogue. As such, I expect all involved with this course to refrain from actions or behaviours that intimidate, humiliate, or demean persons or groups or that undermine their security or self-esteem based on traits related to race, religion, ancestry, place of origin, colour, ethnic origin, citizenship, creed, sex, sexual orientation, gender identity, gender expression, age, marital status, family status, disability, receipt of public assistance or record of offences.

Privacy/FIPPA Statement

Personal information is collected pursuant to section 2(14) of the University of Toronto Act, 1971 and at all times it will be protected in accordance with the Freedom of Information and Protection of Privacy Act. Please note that this course requires presentations of one's work to the group. For more information, please refer to www.utoronto.ca/privacy.

Course Materials (including lecture notes)

Course materials are provided for the exclusive use of enrolled students. Do not share them

with others. I do not want to discover that a student has put any of my materials into the public domain, has sold my materials, or has given my materials to a person or company that is using them to earn money.The University will support me in asserting and pursuing my rights, and my copyrights, in such matters.

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 as soon as possible.
AccessAbility Services staff (located in Rm SW302, Science Wing) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations 416-287-7560 or email ability@utsc.utoronto.ca. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

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