PSYC50: Higher-Level Cognition
0.5 credits
University of Toronto, Scarborough
Summer 2024
LEC01: Friday 9-11AM, KW170

Instructor: Moaz Shoura (call me Moaz…until I get my PhD at least)
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Office Hours: SW410M, Friday 11-12 PM or by appointment

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I.   Your instructor

Moaz Shoura: I am a graduate student in the Department of Psychology at UTSC under the supervision of Dr. Adrian Nestor. My main research interests are the other-race effect, and how race is represented in neural network models, as well as humans (i.e., using Electroencephalography (EEG) to understand race perception). I have taught 1 course in the past (PSYC70: Advanced Research Methods) and have guest lectured for plenty of courses. Other teaching interests include statistics and machine learning.

II.   Course description, pre-requisites and learning goals

What is cognition? What differentiates lower level from higher level cognition? We will cover a broad range of topics in this course, with the first half of the course centered around executive functions, and the second half focused on various higher-level topics (e.g., consciousness, creativity, cognition in AI). Executive functions are a set of mental functions that enable goal-directed behavior. These functions strengthen during typical development and may be affected by numerous factors, including positive (e.g., education) or destructive aspects of nurture (e.g., exposure to teratogens), psychological illness, neurological injury, and more. From a content standpoint, this course will provide you with an opportunity to better understand higher-level cognition from theoretical, experimental and applied standpoints. From a process standpoint, you will have an opportunity to strengthen your ability to consume and critique primary research, to plan and execute a collaborative research project on an appropriate topic of your choosing, and to gain confidence in ability to speak in a scientific context.

Prerequisites: [(PSYB01H3) or (PSYB04H3) or PSYB70H3] *and*
                    PSYB07H3 or STAB22H3 or STAB23H3] *and*
                    [PSYB55H3 or PSYB57H3]

After successful completion of this course, you will have demonstrated an improved ability to:

1. **Describe** the core components and operations of key theoretical frameworks of executive control;
2. **Understand**, **analyze**, and **evaluate** neurocognitive research in the key domains of executive functioning, and, more broadly, higher-level cognition;
3. **Apply** theory and relevant research in executive functioning to a multitude of important, relatable real-world challenges and scenarios (e.g., vulnerability to addiction);
4. **Understand** and **describe** the central elements of primary research articles in the executive function literature, with an eye towards strengthening the ability to **evaluate** this work;

5. **Co-construct** a thoughtful, appropriately-researched project pitch and proposal on a topic pertinent to any topic related to higher-level cognition;
6. **Co-construct** and **co-present** a scientific poster for an academic audience;
7. **Identify** and **articulate** the value and contribution of this course to your broader program of study (i.e., Psychology and/or Mental Health Studies, as appropriate).

III.   Course readings

This course will not use a textbook. This course will prioritize strengthening your ability to become competent in consuming and evaluating primary literature and as such, will rely on such articles. Other than articles provided, the lectures will provide you with all the information you need to succeed in this course.

IV.   Lecture structure

The lectures will be structured into 2 "sections":
1. Content lecture (typically the first hour)
2. Analysis of primary research article (typically the second hour)

In addition, we will have "workshops" that occur throughout the semester to prepare you for the various assignments you need to complete in this course.

The lectures will not be recorded.

V.   Course webpage

Please visit Quercus (https://q.utoronto.ca/) and sign in with your UTORid credentials to access our course webpage. This webpage will house all course-related materials, including announcements, discussion boards, lecture and related learning materials, assessments, and marks. You should expect to visit this webpage a few times per week to ensure you are up-to-date on any new happenings in the course throughout the term.

VI.   Course requirements and grading

Midterm exam (lectures 1-4, 25% of course grade)
(Learning outcomes 1-4, 7)
The goal of the midterm is to test your ability to think about executive functions and higher-level cognition in conceptual, experimental and applied manners. The midterm exam will include material from lectures 1-4 only, focusing on executive functions.

The midterm will consist of both multiple-choice (MC) questions and short-answer (SA) questions. The midterm exam will be 2 hours in length.

The midterm will be scheduled by the registrar in the upcoming weeks. An announcement will be made as soon as the date and time are finalized.

Non-cumulative final exam (lectures 5, 6, 8-10, 35% of course grade)
(Learning outcomes 1-4, 7)
The final exam will cover everything we discuss after lecture 4 (minus the workshop lecture). The format will be consistent with the midterm exam (see above).

Importantly, the date of the Final is not announced by the University until the middle of the term. You should NOT make travel plans until you learn the date of your final exams. You CANNOT take the Final at a different date/time unless you have a verifiable medical reason.

Literature review group project (multiple parts that constitute a total of 40% of the course grade)
(Learning outcomes 1-7)
Together with two to three partners of your choosing, you will engage in research to learn more about a topic related to higher-level cognition. Your group will research a <u>minimum</u> of nine (9) peer-reviewed, scholarly articles and will detail what you've learned into both a proposal and a scientific poster presentation for a scientific audience. Full details will be posted on Quercus – and are an official extension of this syllabus – but the major pieces are noted below.

Forming your group of three to four (PASS/PENALTY scoring)
You are responsible for forming groups prior to the stated deadline. Please use class time and/or the discussion board in Quercus to connect with fellow classmates so that you may share pertinent information for forming a group.

Topic pitch (5% of course grade)
<u>Prior to fleshing out your topic proposal</u>, you will need to submit a one paragraph (max 250 words) pitch to Quercus to clarify what your proposed research will examine, and why it is crucial for others to know about the topic. You will be evaluated on the extent to which your pitch is feasible in the context of this assignment, clearly articulated, and engaging for the reader and proposed audience. There is no need to provide references for the pitch.

Topic proposal (10% of course grade)
<u>After receiving an approved topic pitch with some feedback</u>, you will then co-develop a **~1000 word document**, single-spaced and in 11pt Times New Roman font, that offers: (1) your project's working title, taking care to represent the breadth of your focus in a concise, engaging way; (2) a section introducing your topic, taking care to contextualize and substantiate your research focus/goal, along with a mini literature review; (3) a section on what you believe the limitations of the topic are, with proposed future directions; (4) a paragraph articulating your proposed division of labor to ensure all group members are contributing fairly and equally; and (5) learning outcomes to specify what your audience should expect to learn from your work.

In addition, you will provide an annotated bibliography, which should first include a full list of properly cited references (APA format), and starting on the following page, a brief paragraph summarizing each article and how you plan to use it in your research. This section is not included in the 1000 word limit.

Scientific poster (10% of course grade)
Scientific posters are a critically important medium for conveying scientific knowledge, and this course offers you an ability to practice this process. Your group will assemble a scientific poster to disseminate your findings to others. The research poster will summarize the most important themes from your research paper and present an aesthetically-pleasing and informative review of your background, methods, results, and conclusions (limitations/future directions). We will discuss creating the best poster you can in lecture.

Scientific poster presentation (10% of course grade)
A major part of being a researcher is presenting your findings in a poster format at large conferences. These poster presentations are typically quick and concise. Your group will deliver a 5 to 6-minute presentation with time equally split across presenters. A detailed marking rubric prior to your presentation will be provided so that you understand exactly how you will be marked for this assignment. Your poster will be projected on the lecture screen, and the presentations will take place during the final 2 lectures of the course.

*Please note that in case we do not get through all presentations in the final two lectures of the course, the remaining presentations will occur online in group pairs.

Questions to presenters (5% of course grade)
Another aspect of conferences is being able to consume posters effectively and being able to ask quality questions to the presenter. As such, each student will have an opportunity to ask a question after one of the poster presentations (you will be assigned a poster prior to the presentations). As this may be a newer experience to most of you, this section will be graded leniently (ask a valid question, get the 5%).

VII. Course policies

Late assignments and missed work
A penalty of 5% per day (starting at 100%) will be deducted for late submissions. The last day that we can accept term work is 5 days after the official last day of classes for the term. Late submissions should be uploaded to Quercus in the normal manner.

If a student misses the midterm or final exam due to illness or any other valid reason, please reach out to me as soon as possible. Students have one week from missing the date of the test or quiz to inform the instructor and submit an Absence Declaration on ACORN. Missed tests will be accommodated on a case-by-case basis and may involve make-up assessments, reweighing grades, or alternative assignments.

Email policy
I will do my best to respond to emails within 48 hours of receiving the email. The course has been designed so that you do not need to work on weekends (unless you choose to), and we ask that you respect the personal time of the instructor and TAs in a similar manner. Email contact information can be found on the Quercus homepage for the course. Please include "PSYC50" at the beginning of the subject line of any email related to the course, and please always use your UofT email address in correspondence about the course.

Changes to the course
The schedule, due dates, and nature of assignments are subject to change due to extenuating circumstances beyond our control (as we saw during the lockdowns). Some changes may be mandated by the University. Any other changes will be subject to a class vote, where a simple majority of those enrolled in the course must vote in favor of the change.

Accommodation for personal reasons
There may be times when you are unable to complete coursework, including completing readings, viewing lectures, or attending tutorials, due to non-medical reasons. If this occurs during the term you should contact me immediately to discuss a strategy for completing or dropping the course. It is also a very good idea to speak to an academic advisor.

Religious accommodations
The University has a commitment concerning accommodation for religious observances. We 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 us know as early in the course as possible, and with sufficient notice (at least two 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 Behavior on Academic Matters (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm) outlines the behaviors 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, 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.

Disability-related accommodation request
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 contact the AccessAbility Services Office as soon as possible.

AccessAbility Services staff (located in Rm AA142, Arts and Administration Building) 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.

Special note about grades posted online: Please 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 by the department and posted on ACORN at the end of the course. The department has the right to adjust grades up or down, by a fixed amount that is equivalent for everyone, as they see fit, to maintain standards across sections and years. Please contact me as soon as possible if you think there is an error in any grade posted on Quercus.

Harassment/Discrimination policy
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, we 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, we 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.

Copyright of course materials
Course materials are provided for the exclusive use of enrolled students. You do not have permission to share them or sell them to anyone outside of the course. The materials should not be posted on websites, uploaded to social media sites, printed and distributed or sold to others, nor sold to companies that intend to package them to sell or distribute to other people in print or via the internet. The University will support me in asserting and pursuing my rights, and my copyrights, in such matters. You do have my permission to make your own recordings of any lectures for your own personal use. These may not be distributed, shared, sold, or posted on the internet, in whole or in part, without my permission.

Department of Psychology Missed Term Work Policy

For missed term work (assignments and term tests) due to illness, emergency, or other mitigating circumstances, please follow the procedures outlined below.

Note:
- The following reasons are not considered sufficient for missed term work: travel for leisure, weddings, personal commitments, work commitments, human error.
- Missed *Final* Exams are handled by the Registrar's Office and should be declared on eService.
- Instructors cannot accept term work any later than five business days after the last day of class. Beyond this date, accommodations are only possible via the Registrar's Office petition process.

> The email address to submit missed term work accommodation requests in **PSYC50** is:
> **moaz.shoura@mail.utoronto.ca**

ILLNESS OR EMERGENCY accommodations:
For missed work due to ILLNESS OR EMERGENCY, complete the following process:
1. Complete the Request for Missed Term Work Accommodations Form.
2. Declare your absence on ACORN (Profile & Settings > Absence Declaration)
3. Email **both** of the following items to the course email **WITHIN 2 BUSINESS DAYS** of the missed work:
    a. the Request for Missed Term Work Accommodations Form
       AND
    b. a screenshot of your Self-Declared Absence on ACORN

Note:
- *If you are unable to submit your request within 2 business days, you must still email your instructor within the 2 business day window to explain the nature of the delay. Exceptions to the 2 business day deadline will only be made under exceptional circumstances.*
- *If your absence is declared on ACORN, we do not require any additional supporting documentation (e.g. medical notes) to support your missed term work accommodation request.*

ACADEMIC CONFLICT accommodations:
For missed term work due to an ACADEMIC CONFLICT (e.g. two midterms at the same time):
1. Complete the Request for Missed Term Work Accommodations Form.
2. Take screenshots of your course Quercus pages that demonstrate the conflict.
3. Email the form and screenshots to the course email **at least two weeks (10 business days) before the date of the activity,** or as soon as possible if it was not possible to identify the conflict earlier. Requests sent after the activity deadline may not be accommodated.

Note:
- *Multiple assignments due on the same day are not considered conflicts. Students are expected to manage their time effectively to meet assignment deadlines.*
- *Back-to-back tests/quizzes are not considered conflicts. Only overlapping activities are conflicts.*
- *Students are responsible for keeping their course timetables conflict-free. Students who register in two courses with overlapping lecture/tutorial/lab schedules will not be accommodated.*

RELIGIOUS CONFLICT accommodations:
For missed term work due to a RELIGIOUS CONFLICT:
1. Complete the Request for Missed Term Work Accommodations Form.
2. Email the form to the course **email at least two weeks (10 business days) before the date of the activity**, or as soon as possible if it was not possible to identify the conflict earlier. Requests sent after the activity deadline may not be accommodated.

ACCESSABILITY SERVICES accommodations:

(6/11)

For missed *TERM TESTS* due to ACCESSABILITY REASONS:
- **Contact your AccessAbility consultant** and have them email the course email detailing accommodations required.

For missed *ASSIGNMENTS* due to ACCESSABILITY REASONS:
- If your desired accommodation is **within the scope** of your Accommodation Letter (e.g. your letter includes "extensions of up to 7 days" and you need 3 days):
    1. Complete the Request for Missed Term Work Accommodations Form.
    2. Email the form ***AND*** your **Accommodation Letter** to the course email specifying how many days extension you are requesting.
- If your desired accommodation is **outside the scope** of your Accommodation Letter (e.g. your letter includes "extensions of up to 7 days" but you need more time than that):
    1. **Contact your AccessAbility consultant** and have them email the course email detailing the accommodations required.

Accommodation Procedure:
After submitting your documentation, you will receive a response from your instructor or TA. This form does not guarantee that you will be accommodated. 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. **You are responsible for checking your official U of T email and Quercus course announcements daily**, as accommodations may be time-critical.

For missed assignments, **do not wait for the instructor's response to resume work on your assignment.** Extensions may be as short as one business day, depending on the nature of the illness/emergency. Complete your assignment as soon as you're able, and email it to your instructor.

For an **anticipated absence** (e.g. a scheduled surgery or an illness with a prolonged recovery period), if you would like to request accommodations in advance, submit a Verification of Illness Form completed by your doctor AND the Request for Missed Term Work Accommodations Form to the course email. Absences can be declared up to 14 days into the future on ACORN.

Missed Accommodations
If an accommodation is granted but a continued illness/emergency prevents you from meeting its requirements, you must repeat the missed term work procedure to request additional accommodations. **Please make it clear in your subject line that you are requesting a second accommodation.** E.g. If you are given an extension but are still sick and need more time, or if you miss a make-up term test, you must submit *another* Request for Missed Term Work Accommodations Form and declare your extended absence on ACORN. *Note: In the case of a missed make-up test, an opportunity to write a second make-up test may not necessarily be provided.

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 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.

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/Assets/Governing+Council+Digital+Assets/Policies/PDF/ppjun011995.pdf**) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

In 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.

On tests and exams:
- Receiving aid of any form from another person in the context of an examination
- Using or possessing unauthorized aids;
- Looking at someone else's answers during an exam or test;
- Misrepresenting your identity; and
- When you knew or ought to have known you were doing it.

In academic work:
- Falsifying institutional documents or grades;
- Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes; and
- When you knew or ought to have known you were doing so.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If students have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, they are expected to seek out additional information on academic integrity from their instructors or from other institutional resources.

Note that you may see advertisements for services offering grammar help, essay editing and proof-reading. Be very careful. If these services take a draft of your work and significantly change the content and/or language, you may be committing an academic offence (unauthorized assistance) under the *Code of Behaviour on Academic Matters.*

It is much better and safer to take your draft to the Writing Centre as early as you can. They will give you guidance you can trust. Students for whom English is not their first language should go to the English Language Development Centre.

If you decide to use these services in spite of this caution, you <u>must </u>keep a draft of your work and any notes you made before you got help and <u>be prepared to give it to your instructor on request.</u>

Assigned readings

Chae, S. E., & Alexander, P. A. (2022). Exploring Potential Educational and Social Contributors to Relational Reasoning Development. *Mind, Brain, and Education*, *16*(2), 183-192. https://doi.org/10.1111/mbe.12311

Frith, C. D. (2021). The neural basis of consciousness. *Psychological medicine, 51*(4), 550-562. DOI: https://doi.org/10.1017/S0033291719002204

Gilbert, S. J., & Burgess, P. W. (2008). Executive function. *Current Biology*, *18*(3), R110-R114. https://doi.org/10.1016/j.cub.2007.12.014

Hardee, J. E., Phaneuf, C., Cope, L., Zucker, R., Gearhardt, A., & Heitzeg, M. (2020). Neural correlates of inhibitory control in youth with symptoms of food addiction. *Appetite*, *148*, 104578. https://doi.org/10.1016/j.appet.2019.104578

He, J. W., Tu, Z. H., Xiao, L., Su, T., & Tang, Y. X. (2020). Effect of restricting bedtime mobile phone use on sleep, arousal, mood, and working memory: a randomized pilot trial. *PloS One*, *15*(2), e0228756. https://doi.org/10.1371/journal.pone.0228756

Jozwik, K. M., O'Keeffe, J., Storrs, K. R., Guo, W., Golan, T., & Kriegeskorte, N. (2022). Face dissimilarity judgments are predicted by representational distance in morphable and image-computable models. *Proceedings of the National Academy of Sciences, 119*(27), e2115047119. https://doi.org/10.1073/pnas.2115047119

Sangrigoli, S., Pallier, C., Argenti, A. M., Ventureyra, V. A., & de Schonen, S. (2005). Reversibility of the other-race effect in face recognition during childhood. *Psychological Science, 16*(6), 440-444. https://doi.org/10.1111/j.0956-7976.2005.01554

Wegmann, E., Müller, S. M., Turel, O., & Brand, M. (2020). Interactions of impulsivity, general executive functions, and specific inhibitory control explain symptoms of social-networks-use disorder: An experimental study. *Scientific Reports*, *10*(1), 1-12. https://doi.org/10.1038/s41598-020-60819-4

Yu, Y., Yu, Y., & Lin, Y. (2020). Anxiety and depression aggravate impulsiveness: the mediating and moderating role of cognitive flexibility. *Psychology, Health & Medicine*, *25*(1), 25-36. https://doi.org/10.1080/13548506.2019.1601748

Zhou, Z., Zhou, H., & Zhu, H. (2016). Working memory, executive function and impulsivity in Internet-addictive disorders: a comparison with pathological gambling. *Acta Neuropsychiatrica*, *28*(2), 92-100. https://doi.org/10.1017/neu.2015.54

PSYC50: Lecture and reading schedule

May be subject to minor revisions with advance notice from the instructor

Week	Date	Topic	Reading	Deadline	Workshop
1	10-May-24	Course and syllabus overview; what is higher-level cognition?	Gilbert & Burgess (2008)		How to read papers
2	17-May-24	Working memory	He et al. (2020)		
3	24-May-24	Inhibitory Control	Wegmann et al. (2020)	Create groups	
4	31-May-24	Cognitive Flexibility	Yu et al. (2020)		
5	07-Jun-24	Perception	Sangrigoli et al. (2005)	Proposal pitch	
6	14-Jun-24	Consciousness	Frith (2021)		How to write a proposal
	21-Jun-24	NO CLASS - READING WEEK			
7	05-Jul-24	Skills workshop	None	Proposal	How to make a good poster; how to present a poster
8	12-Jul-24	Reasoning, problem-solving, and creativity	Chae & Alexander (2021)		
9	19-Jul-24	Addiction	Hardee et al. (2020), Zhu et al. (2015)		
10	26-Jul-24	Can AI model cognition?	Jozwik et al. (2022)		
11	02-Aug-24	Poster presentations		Posters due August 1st, 11:59 PM	
12	07-Aug-24*	Poster presentations			

*please note that there is no class June 28th as it is presidential day, the make up class will take place August 7th