

Acknowledgment

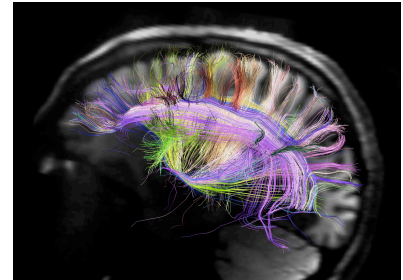
UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the x̣^w ṃəθḳ^w əỵəm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on in their culture, history, and traditions from one generation to the next on this site.

PSYCHOLOGY 365

Cognitive Neuroscience

3 credits

Pre-requisites: One of PSYC 260, PSYC 270, COGS 200.



University of British Columbia, Vancouver

Jan-April, 2020

T-Th 3:30-5:00

Swing 222

Instructor: Dr. Rebecca Todd
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Office Hours: Wed 1:30-2:30pm

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Office Hours: Tues 12:00-1:00pm

TA: Maria (Joey) Manaligod
E-mail: mmanaligod@psych.ubc.ca
Office: CIRS 4342A
Office Hours: Thurs 11:00am-12:00pm

I. About your instructor and teaching assistants

Dr. Rebecca (Beck) Todd is a faculty member in the Cognitive Science area of Psychology. She received her Ph.D. in Psychology and Neuroscience from University of Toronto. Her interests focus on the influence of emotion on attention and memory, and why our attention is tuned to things in the environment because of our own unique history and priorities. She also studies brain processes that contribute to these "biases" in attention and memory, as well as how they develop across the lifespan.

Ryan Tomm is a second-year PhD student in the Behavioural Neuroscience area of Psychology under the supervision of Dr. Rebecca Todd. He received his MA at UBC under the supervision of Dr. Kiran Soma and

Dr. Stan Floresco studying the effects of neurosteroid synthesis on behavioural flexibility. Ryan's current research focuses on understanding how positive or negative valence influence cognitive processes during reward-seeking and avoidance behaviours. He is interested in understanding how these processes may be uniquely altered in different clinical populations so that current treatments and diagnostic tools can be improved.

Maria (Joey) Manaligod is a second-year MA student in cognitive psychology. Her research focuses on things that influence what we attend to, particularly how emotional meaning built through experience influences the way we remember and attend to things later on. She is also interested in emotional memory and how timing variations influence memory at both stages of encoding and consolidation.

Course description and goals. The two-fold goal of this course is to introduce you to questions that drive research in cognitive neuroscience and the methods we have to answer them, while engaging you in active and critical discussion of current research and controversies in the field. That is, the goal is to give you a taste of classic studies and late-breaking news in the neuroscience of human cognition, while giving you the skills to make your own decisions about what information means and what to do about it in the world of FAKE NEWS! Topics include the cognitive neuroscience of perception, attention, learning, memory, and decision-making. After successful completion of this course, you will have a better understanding of what we know and don't know about the mysterious workings of the human mind and brain — and a glimpse of what the future may hold.

II. Course Materials

Readings

Required Textbook. Richard Passingham (2016). *Cognitive Neuroscience: A Very Short Introduction*. Oxford University Press. Available at the Bookstore. Also available as an ebook. ISBN: 9780198786221. The inexpensive and very readable book will provide a general overview and some background for the experimental studies we will read and discuss in class.

Other readings. These include peer-reviewed experimental papers which will be posted on Canvas. Papers are also available through the UBC library. There will also be videos, media articles, and blog posts occasionally assigned.

Readings are meant to provide background (textbook) as well as details (papers) of scientific studies to be covered in each class, and will be due before class. The lectures will not simply recapitulate the readings, but will build on, expand and clarify material in the readings as well as *provide additional information*. Therefore, it's important to make sure you do the readings before the relevant lecture so that you have the necessary background for the lecture material. The lectures will highlight the information from the papers that you will need for the exams, so that you can study what's important. Most weeks you will be required to read ONE empirical paper a week. Papers listed in parentheses are optional, and are sources of material that will be in the lecture. FOR OPTIONAL PAPERS YOU WILL ONLY BE EXAMINED ON MATERIAL THAT IS IN THE LECTURE.

i-clickers. The I-clicker response system will be required for participation. Note that there will be i-clicker questions on the readings at the beginning of each class. This is to encourage you to do the readings and to get to class on time!

III. Course webpage

<https://canvas.ubc.ca/> (location for important announcements, readings, lecture notes, discussion, and grades)

IV. Course requirements

The assignments in this course are designed to foster an understanding of cutting-edge research in cognitive neuroscience that is informed by background knowledge of how thinking has developed in each research area. Readings, lectures, and exams will be geared towards this goal.

Note that **class time** is hands on. Your weekly responsibilities in this class include:

- Read the chapter/article for that class as background *before you come to class*.
- Participate *actively* via i-clickers and class discussion.

Academic concessions

For course policies regarding in-term academic concessions, please refer to the relevant UBC calendar entry: <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,329,0,0>.

Exams

Exams will cover all in-class (e.g., lecture and video) and reading material. Note that lectures add to and elaborate on reading materials, and will contain information that is not in the readings. **All Exams** will be a mixture of multiple choice and short answer questions, but the proportion of short answer to multiple choice will be larger with each successive exam. Multiple choice questions are a way to test whether you have adequately learned the range of material we've covered and short answer questions test your ability to synthesize it. As we go along there will be more to synthesize and you will have had more practice doing it. Course policy is that we do not give make-up quizzes and midterms. If you are excused from the quiz or one of the midterms we will distribute that proportion of your grade across the other exams.

Quiz: Brain Imaging and Neuroanatomy (10% of total course grade).

This in-class quiz is designed to ensure students have a sufficient foundation in neuroanatomy and cognitive neuroscience research methods to sufficiently understand and evaluate the studies discussed over the rest of the course. It is also structured to provide some lower-stakes practice for the midterms and final. I will post a practice version of the quiz in the first week of class.

2 Midterms (20% each, 40% of total course grade).

These will draw on both lectures and the readings. For superior performance; you must have a clear understanding of both. There are two midterms so that you can digest the material in smaller chunks, which should allow you to master it better. Having two midterms also gives you more practice for the final exam, and the chance to keep bringing up your game, as well as giving you some insurance if one of the exam days is just a bad day.

Final Examination (45% of total course grade). While there will be more emphasis on material not covered in the mid-terms, the final will be cumulative in that you will be expected to synthesize more recent material with material learned earlier in the course. **Please note: the date of the final will not be announced until mid-February and so I strongly advise you NOT to plan travel until you learn the dates of your final exams. You cannot take the final on a different date/time unless you have a documented medical illness.**

Participation (5% of total course grade). I-clicker. Your participation grade will be the total i-clicker points you are credited for **STARTING TUES, JAN 8**. You will get 5 points per session if you answer at least 75% of the questions that session. There are 20 classes with i-clicker sessions allowing for a total of 100 points. Everybody starts with a 10-point bonus to allow for two non-penalized sick days/absences or joining the class later. **If you forget your i-clicker I CANNOT give you participation points!!!**

Research participation (extra credit). You also have the opportunity to earn up to **two (2)** extra percentage points on your overall final grade by participating in studies regularly conducted by the Psychology Department and coordinated through the human subject pool (HSP). This provides the valuable opportunity to observe the research process directly and to contribute to the ongoing research activities at UBC. The extra grades are obtained by signing up for the Introductory Psychology Subject Pool through their web site: <https://hsp.psych.ubc.ca/>. Please note that any inquiries about credits should be directed to HSP or the experimenters that you worked with, *not* the instructor.

One percentage point is assigned to your final grade for each hour of participation and partial credits will be rounded down (i.e., 1.5 hours = 1% extra credit). Credits can be recorded and tracked via the subject credit website. These credits are added to your grade at the end of the course. If you do not correctly assign your credits to this course, you will NOT receive credit so please make sure you have done this correctly.

As an alternative to participating in studies, you may choose to complete library writing projects, in which you read and summarize a research article; each article summary counts as one hour of research participation. You must select a research article (not a letter to the editor, commentary, or review paper) published between 2000-present in the journal *Psychological Science*. Each summary should be about 500 words and should include the purpose, method and results of the study. Library assignments are due on the last day of classes (Friday April 5 for the upcoming term). If you choose the library option, you should submit their assignment on TurnItIn. Please contact Prof. Todd for the class ID for "Psychology HSP (Winter 2019)", password "research". A full description of the library assignment is available on page 4 of "Info for Participants" document.

Piazza for Discussions

You will be able to sign up on the class Q&A forum by clicking the Piazza link in Canvas. You will need to create a new password.

- After that you can view Piazza by clicking the Canvas link.
- <http://support.piazza.com/>
- piazza.com/ubc.ca/winterterm22020/psyc365001
- You can direct any quiz/exam related questions there!

V. Course grading

Your final grade consists of the items described in Section IV. Performance for each of the items above will be put into a calculator that outputs your final course percentage earned. As mentioned in Section IV, any extra credit earned will be added to this final score.

In order to reduce grade inflation and maintain equity across multiple course sections, all psychology courses are required to comply with departmental norms regarding grade distributions. According to departmental norms, **the mean grade in a 300-level class in psychology is 70 for a good class, 68 for an average class, and 66 for a weak class, with a standard deviation of 13.** Averages may be higher in classes such as this one where the majority of students are not BA Psychology majors. Scaling may be used in order to comply with these norms; grades may be scaled up or down as necessary by the professor or department. Grades are not official until they appear on a student's academic record. You will receive both a percent and a letter grade for this course. At UBC, your course percentage is converted according to the key below:

| | | | | | | | |
|-----------|---------|-----------|--------|-----------|--------|----------|--------|
| A+ | 90-100% | B+ | 76-79% | C+ | 64-67% | D | 50-54% |
| A | 85-89% | B | 72-75% | C | 60-63% | F | 0-49% |
| A- | 80-84% | B- | 68-71% | C- | 55-59% | | |

Remember, you are earning a degree at a highly reputable post-secondary institution. Therefore, criteria for success are high. The Faculty of Arts offers the following guidelines that broadly characterize the kind of work that is generally associated with the main grade ranges. These characteristics help to put the Psychology Department Grading Policies into context. Please note that adequate performance is in the C range, which is the typical class average.

A RANGE: *Exceptional Performance.* Strong evidence of original thinking; good organization in written work; capacity to analyze (i.e., break ideas down) and to synthesize (i.e., bring different ideas together in a coherent way); superior grasp of subject matter with sound critical evaluations; evidence of extensive knowledge base.

B RANGE: *Competent Performance.* Evidence of grasp of subject matter; some evidence of critical capacity and analytic ability; reasonable understanding of relevant issues; evidence of familiarity with the literature.

D-C RANGE: *Adequate Performance.* Understanding of the subject matter; ability to develop solutions to simple problems in the material; acceptable but uninspired work; not seriously faulty but lacking style and vigor.

F RANGE: *Inadequate Performance.* Little or no evidence of understanding of the subject matter; weakness in critical and analytical skills; limited or irrelevant use of the literature.

VI. University policies

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access, including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on [the UBC Senate website](#).

VII. Course policies

Class participation & lecture slides.

Active learning is a critical component of a good education and it is an important feature of this course. For that reason, participation via i-clicker is worth 5% of your grade. Lecture slides will be uploaded before class.

Readings

The readings will be current experimental papers featuring cutting edge studies in cognitive neuroscience, supplemented by short chapters from the Passingham textbook. Note these papers are demanding! I will walk you through how to read these papers and point you to what material is important

to know for exams and quizzes and what methodological details are unnecessary for our understanding of the papers.

E-mail policy

In most cases, e-mails will be answered within 48 hours of receipt (not including weekends). If you send the instructor or teaching assistants an email, the email subject should include the course and nature of the inquiry (i.e., "PSYC 365 – Question about memory consolidation"). Emails that you send should contain no more than one question and you should try to explain your current understanding of the concept in the email (which will be affirmed or corrected).

If you have more than one question, you should visit office hours. Please note that emails about test questions may very well not be answered the day before an exam so please plan accordingly.

Devices in class.

Some research suggests that writing notes on paper helps you learn and study better. But if you have a need or preference to use a laptop, that's fine. Please avoid doing things that aren't related to the class. If you do use a device, you might be asked to sit in a particular location in the room that I think is most suitable for the learning environment for other students in the class. No devices are allowed during quizzes/exams unless specified otherwise.

Syllabus changes

There may be minor changes to the syllabus during the term. You will be notified of these changes ASAP and no changes will be instituted that dramatically affect your ability to properly prepare for an examination.

Office hours

You are strongly encouraged to visit office hours if you have questions or concerns about any of the material. If you cannot attend regularly scheduled office hours, you should send an email to try to make an appointment for another time (please give at least 48 hours of notice). You may also come to office hours to ask about graduate school, research or other related questions. If we cannot answer your question(s) about topics beyond the course, we'll direct you to someone who can.

You will need to visit TA office hours to review your quizzes and exams if you so choose. If you have any outstanding questions you can fill out a request form and talk to Dr. Todd. Any grading disputes other than calculation errors for the midterms must be handled with Dr. Todd within three weeks of when the scores were released.

Classroom conduct

Our classroom is a place where you should always feel safe and respected. It is also a place that is conducive to learning and intellectual curiosity. Any behaviors compromising this environment will not be tolerated and the student(s) and/or individual(s) will be asked to leave.

Access and Diversity

UBC is committed to equal opportunity in education for all students including those with documented physical or learning disabilities. If you believe you fall in this category, please visit this website (<http://www.students.ubc.ca/access/disability-services/support-students/exam-accommodations/>) to take the necessary steps to ensure that you have every opportunity that you deserve to excel here at UBC.

Grade bumps

When computing final grades, the instructor carefully analyzes every single student to determine whether a grade bump is deserved. Bumps may be awarded for consistent performance at a major grade boundary or for marked improvement from the midterm to the final (i.e., 10%+). Bumps are not guaranteed and are **not** awarded for non-academic reasons (i.e., student is graduating and/or involved in sports or other extracurricular activities). **DO NOT send the instructor an email asking for a grade bump.**

Academic Misconduct

Cheating, plagiarism, and other forms of academic misconduct are very serious concerns of the University, and the Department of Psychology has taken steps to alleviate them. Relevant to this course, the Department has implemented software that can reliably detect cheating on multiple-choice exams by analyzing the patterns of students' responses. This will be used for every assessment we take in this course. For what how to avoid plagiarism on writing assignments see UBC guidelines for plagiarism:

<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,959>

In all cases of suspected academic misconduct, the parties involved will be pursued to the fullest extent dictated by the guidelines of the University. Strong evidence of cheating may result in a zero credit for the work in question. According to the University Act (section 61), the President of UBC has the right to impose harsher penalties including (but not limited to) a failing grade for the course, suspension from the University, cancellation of scholarships, or a notation added to a student's transcript.

Do note that during exams, the instructor and invigilators reserve the right to move students in their seating arrangement with no explanation provided.

VIII. Learning analytics

Learning analytics includes the collection and analysis of data about learners to improve teaching and learning. This course will be using the following learning technologies: Canvas, i-clicker, Piazza. Many of these tools capture data about your activity and provide information that can be used to improve the quality of teaching and learning. In this course, I plan to use analytics data to:

- View overall class progress
- Review statistics on course content being accessed to support improvements in the course
- Track participation in discussion forums

IX. Copyright

All materials of this course (course handouts, lecture slides, assessments, course readings, etc.) are the intellectual property of the Course Instructor or licensed for use by the copyright owner. Redistribution of these materials by any means without permission of the copyright holder(s) constitutes a breach of copyright and may lead to academic discipline.

Students are permitted to record lectures.

X. Links that you may find useful...

Helpful student information

UBC Academic Calendar

<http://www.calendar.ubc.ca/vancouver/academicyear.cfm>

UBC Access and Diversity

<http://www.students.ubc.ca/access/index.cfm>

Tips to help overcome test anxiety

http://www.swccd.edu/~asc/lrnlinks/test_anxiety.html

WELLNESS RESOURCES

Below you will find a list of resources you may want to utilize if you are struggling in any way to manage your responsibilities while in school or the stresses of life in general.

The Kaleidoscope:

the-kaleidoscope.com

A confidential peer-run mental health support group that takes place on campus at least once a week. You may attend the group if you are experiencing any kind of mental health related challenges, or if you're just feeling stressed about school in general. Registration is not required to attend the group. See the website for meeting times and locations. Food and drink are provided.

Counselling Services:

students.ubc.ca/livewell/services/counselling-services

Phone number: 604-822-3811

Counselling services offers a variety of resources to help you maintain your mental health while in school. You may see a counsellor on an individual basis, attend group counselling, or to document an illness if you should require academic concession.

SpeakEasy:

ams.ubc.ca/services/speakeasy/

Phone number: 604-822-9246

A student run service that offers confidential support for students experiencing crisis. Also a good resource for additional information and referrals within the UBC community.

Empower Me:

http://www.studentcare.ca/rte/en/UniversityofBritishColumbiaAMSGSS_EmpowerMe_EmpowerMe

A 24/7 website/telephone/app resource for mental health, productivity, nutrition, etc. that just emerged this past September. No issues are too big or small. Request support for depression, anxiety, grief, relationship problems, adjusting to life in a new country, addictions, mild substance abuse, educational conflict, disordered eating, and more.

SHARE:

<http://www.vivreshare.org/> Self Harm Anonymous Recovery and Education is a program designed to promote self care and educate about self harm. SHARE support groups meet biweekly; times and locations can be found on their website.

UBC Wellness Centre:

students.ubc.ca/livewell/services/wellness-centre

Phone number: 604-822-8450

Speak with other students about tips for managing stress, keeping healthy sleep and eating patterns, concerns about safe sex and more.

Access and Diversity:

students.ubc.ca/about/access

604-822-5844

Access and Diversity provides accommodations for students living with physical or mental disabilities.

Student Health Services:

students.ubc.ca/livewell/services/student-health-service

604- 822-7011

Student health provides students with a variety of healthcare related services to help you maintain your health while studying. Access to doctors and registered nurses.

Mood Disorders Clinic UBC:

ubc-mooddisorders.vch.ca/

A psychiatric program designed specifically to treat individuals living with depression or bipolar disorder.

Live Well, Learn Well:

students.ubc.ca/livewelllearnwell

The Live Well, Learn Well initiative is a resource hub that provides students with information to help improve physical and mental wellbeing.

Mental Health Awareness Club:

ubcmhac.sites.olt.ubc.ca/

A club that offers opportunities to speak about mental health with others and strives to promote mental health awareness throughout the UBC community.

Pacific Spirit Addiction Services:

3rd Floor, 2110 West 43rd Ave Vancouver B.C. V6M 2E1

Phone number: 604-267-3970

A free and confidential service for youth and young adults up to the age of 24. Services include counselling, access to an addiction physician - including usage of a methadone maintenance program - and a drug education series.

AMS Food Bank:

ams.ubc.ca/services/food-bank/

If you are in a financial emergency AMS food bank can provide you with a food hamper. You are able to use the service up to 6 times each term.

UBC Psychology Clinic:

clinic.psych.ubc.ca

Professional psychological services provided to the community, including assessment & treatment for children, adults & families by clinical psychology trainees.

BC Crisis Center:

crisiscentre.bc.ca

Phone number: 604-872-3311

Non-profit, volunteer-driven organization that provides emotional support to youth, adults, and seniors in crisis in BC. Crisis line available 24/7.

Distress Line:

Phone number: 1-800-Suicide (784-2433)

If you are in distress or are worried about someone in distress who may hurt themselves, call 1-800-SUICIDE 24 hours a day to connect to a BC crisis line, without a wait or busy signal.

Psychology 365 2020: CLASS and reading schedule

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

| <u>Lecture</u> | <u>Date</u> | <u>Day</u> | <u>Topic</u> | <u>Assignment</u> |
|----------------|-------------|------------|---|--|
| 1 | 7-Jan | T | Introduction/Syllabus | (readings in parentheses are optional) |
| 2 | 9-Jan | Th | Cognitive Neuroscience: The Good, the Bad, and the Ugly | Passingham Chap 1; How to Read a Scientific Paper for Non-Scientists |
| 3 | 14-Jan | T | Cog Neurosci methods | Poldrack, 2015 |
| 4 | 16-Jan | Th | fMRI : Workhorse of Cog Neuro | Blog: Decoding Brain Activity |
| 5 | 21-Jan | T | The landscape of the brain | 3D brain atlas, 2-minute Neuroscience videos |
| 6 | 23-Jan | Th | Quiz!! Brain network development | |
| 7 | 28-Jan | T | Recognizing objects | Passingham Chap 2; Blog: Core Object Recognition |
| 8 | 30-Jan | Th | Recognizing Objects Part 2 | Blog: Neural networks made easy |
| 9 | 4-Feb | T | Classifying Objects | How to Read a Scientific Paper (Connolly et al., 2012) |
| 10 | 6-Feb | Th | What is special about faces? | Van Bavel et al., 2008; Cracking face code |
| 11 | 11Feb | T | Predicting perception | Egner, Monti & Summerfield, 2009 |
| 12 | 13-Feb | Th | Midterm 1 (Classes 6-11) | |
| | 17-21 Feb | | NO CLASS – Reading Week | |
| 13 | 25-Feb | T | Selecting Attention | Passingham Chapter 3 |
| 14 | 27-Feb | Th | Sustaining attention | Rosenberg et al., 2016 |
| 15 | 3-Mar | T | Emotion, motivation and attention | (Panksepp, Affective Neuroscience, Chap 3 up to AFTERTHOUGHT p. 56) |
| 16 | 5-Mar | Th | Reward and attention (& learning) | Anderson et al., 2016; Blog: The Many Crimes Against Dopamine |
| 17 | 10-Mar | T | Finish reward & attention & review | |
| 18 | 12-Mar | Th | Midterm 2 (Classes 13 -17) | |
| 19 | 17-Mar | T | The Hippocampus: From space travel to time travel | Passingham Chapter 4 |
| 20 | 19-Mar | Th | Episodic memory | How to See a Memory (Bonnici & McGuire, 2012) |
| 21 | 24-Mar | T | Rehearsing and retrieving memories | Bird et al., 2015 (Richter et al., 2016) |
| 22 | 26-Mar | Th | Making decisions | Passingham Chap 6 |
| 23 | 31-March | T | Guest Lecture | TBA |
| 24 | 2-April | Th | Whither CogNeuro? | Hassan et al., 2019 |
| 25 | 7-April | T | Catch up and review | |