

# PSYCHOLOGY 312 COGNITIVE DEVELOPMENT: THE MECHANISMS OF CHANGE

## CONTACT INFORMATION

**Course Instructor:** Professor John Vervaeke

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**Email policy:** Please send email to **both** email addresses. Please keep all email to no more than five sentences. If a longer email is needed then we should meet in person instead. I will respond within 48 hours to email, but 72 hours during peek periods, i.e., one week before exam and before essay due dates. I will **not** read email on Sundays and this day does not count towards the 48 or 72 hour return time. Please put your course code into the subject line. I will **not** respond to email that does not have a course code in the subject line

**Office:** UC F 307

**Office Hours:** TBA

## INTRODUCTION

Welcome to PSY 312 Cognitive Development: The Mechanisms of Change. In this course we will be examining the processes of cognitive development with an emphasis on psychological theories of the mechanisms of change, viz., learning, plasticity, and social networking. The course will argue that in addition to studying the narrative of cognitive development we need to get a clear picture of the processes that drive change and what the central properties of those processes are. The main claim of the course is that as we move to models of cognitive change that emphasize dynamical systems with the central property of being self-organizing, the distinction between cognitive development and cognitive functioning breakdown.

Cognitive development then goes from being the back story to our theories of cognitive functioning to becoming an integral part of such theories.

## LEARNING OBJECTIVES

In this course you will learn about the experimental and theoretical methods of Cognitive Psychology. You will learn how to apply models from dynamical systems, machine learning, and evolutionary biology to psychological theorizing. You will learn to think critically about experiments, theoretical explanations, and the important relationship between theory and data. You will come to a better understanding of the phenomena of cognitive development through a critical examination of the explanations of those phenomena offered by Cognitive Psychology and related disciplines such as Biology, Cognitive Science and Neuroscience.

## OVERALL STRATEGY

Make sure to do the readings every week. Please note that I will not always be directly lecturing on the readings. I will not test you directly on the readings, but instead, I will expect you to incorporate their contents, as you deem relevant in answering test and exam questions or in preparing essays. Consider reading recommended readings as you prepare for your essays. Attending lectures is very important, as I will **often** discuss material not directly in the readings. I recommend coming to see me during office hours to discuss your essay topics and structural outline for your essays.

## LECTURE AND READING SCHEDULE

1<sup>st</sup> Week (Sept 12) Course introduction: Review syllabus and course structure. Discuss the nature of development, important themes and thematic interaction, and present the central focus and thesis of the course.

2<sup>nd</sup> Week (Sept 19) Main theoretical frameworks. Read Flavell et. al. Chapter 1. Read Rescorla, Hollis, and Rumbaugh et. al..

3<sup>rd</sup> Week (Sept 26) Main theoretical frameworks. **I WILL BE AWAY AT A CONFERENCE THIS WEEK. I WILL ANNOUNCE A LINK TO A LECTURE I WILL RECORD.** Read Flavell et. al. Chapter 3. Read Siegel.

4<sup>th</sup> Week (Oct3) Main theoretical frameworks. Read Flavell et. al. Chapters 2 and 5. Read Barsalou

5<sup>th</sup> Week (Oct 10) Main theoretical frameworks. Read Tognoli and Kelso. Read Lewis 2000 and Lewis 2005. Read Kozioli et. al. Read Foglia and Wilson. Read Anderson.

6<sup>th</sup> Week (Oct 17) **In class test.** Two sections. First is short essay answer explaining an important concept, to what important issues and debates it is relevant, how it is relevant, and any important critical response. Second section is a larger more integrative essay. Choice for both sections. See below for longer explanation and rubric.

**Topic proposal** due Oct 17th. **Submit on Quercus by 11:59.** Three paragraphs. First paragraph explains what your topic is. The second paragraph explains how and why your topic is relevant to the course. The third paragraph gives an overview of how you will pursue your topic in 3000 words. Your topic proposal will also contain a preliminary bibliography of 5 sources indicating how there is relevant material for your topic. Worth 5%.

7<sup>th</sup> Week (Oct 24) Main theoretical frameworks. Catch up on reading

8<sup>th</sup> Week (Oct 31). Main theoretical frameworks. Catch up on reading

**No class Nov 8 Fall break**

9<sup>th</sup> Week ( Nov 14 ). Intelligence. Read Flavell et. al. Chapter 4. Read Mercado. Read Friston. Read Garlick

10<sup>th</sup> Week (Nov 21) Intelligence Read Vervaeke et al. 2012. Read Vervaeke and Ferraro 2013

11<sup>th</sup> Week (Nov 28) Dynamical and Embedded Read Kozlio et al. , Tognoli and Kelso, Anderson

**Essay due Nov 28** 3000 words argumentative essay establishing the plausibility of a clear and challenging thesis that has emerged from you researching your topic. You must critically exam the arguments and evidence of the researchers relevant to your topic, and then integrate your critical conclusions into an argument that establishes the plausibility of your thesis which you will defend against potential criticisms. Proper citation, reference list, and APA format is required. 200 word abstract is mandatory. This does not count towards your word limit. See below rubric. **Submit on Quercus by 11:59pm.**

12<sup>th</sup> Week (Dec 6) Wisdom Read Flavell et, al. Chapter 6 Read Vervaeke and Ferraro 2012 draft. Read Stanovich and West.

**COURSE REQUIREMENTS**

Test, Oct 17 worth 20%. The test will consist of two parts. The first part is a short answer section in which you will be given 10 terms or phrases of which you must answer 4. For each answer you will need to provide an explanation of the concept, explain to which theories or debates it is relevant, explain how and why it is relevant, and bring up any relevant criticisms or connections to other course material. Since you may refer to your short essay answers in your long essay answers it is a good idea to answer these questions strategically. Each answer will be worth 5 marks. Answers are typically 2 paragraphs long but this not mandatory.

The rubric for the short answers will be as follows:

- a) Definition/explanation of the concept 2 marks.
- b) Explanation of to which theories and/or debates it is relevant 1 mark.
- c) Explanation of how and why it is relevant 1 marks.
- d) Relevant criticisms and/or connections 1 mark.

The second part is a long essay answer. Here you will be given 4 questions and you must answer 1 of these questions. It is important to you state, develop, and defend a particular thesis for you answer. You are making an argument based on lecture material, and the reading as to what the best answer to the essay question is. You may refer to your short answers from section 1 in order to avoid re-explaining a topic. **This is the only internal reference allowed. You may not refer to your long answer in your short answers or to one short answer within another.** It is important when defending your thesis that you consider possible objections to it and respond them. Please be assured that you will be marked at the standard of an in-class essay. The answer will be out of 30

The rubric for this answer will be as follows:

- a) 5 marks for clearly state a clear and challenging thesis.
- b) 10 marks for an argument developing and defending your thesis.
- c) 10 marks for making use of the relevant course material from the lectures and reading.
- d) 5 marks for overall style and clarity of exposition.

Topic Proposal Oct 17 worth 5%

Essay Nov 28 worth 30%.

Here is the rubric that will be used for the essay:

- 1) 10 marks for choosing and framing a topic.
- 2) 10 marks for coming up with a clear and challenging thesis.
- 3) 20 marks for critically reviewing relevant empirical research
- 4) 20 marks for critically reviewing relevant theoretical debate
- 5) 30 marks for an integrative argument for your thesis.
- 6) 10 marks for proper APA format, abstract and overall style

There is a potential penalty of 10% if relevant class material is not appropriately addressed. This does not apply if you choose a topic for which there has not been lecture material.

Final exam worth 45%. This will have the same format and rubric as the test.

### **Reading List.**

Flavell et al. *Cognitive Development Fourth Edition.*

Rescorla *Pavlovian Conditioning: It's Not What You Think It Is* in *American Psychologist* (1988), Vol. 43, No. 3, 151-160

Hollis *Contemporary Research on Pavlovian Conditioning: A "New" Functional Analysis* in *American Psychologist* (1997), Vol. 52, No. 9, 956-965

Rumbaugh et. al. *A Salience Theory of Learning and Behavior: With Perspectives on Neurobiology and Cognition.* In *Int J Primatol* (2007) 28:973-996  
DOI 10.1007/s10764-007-9179-8

Siegel *Toward and Interpersonal Neurobiology of the Developing Mind: Attachment Relationships, "Mindsight," and Neural Integration.* In *INFANT MENTAL HEALTH JOURNAL*, Vol. 22(1-2), 67-94 (2001)

Barsalou *Grounded Cognition.* In *Annu. Rev. Psychol.* 2008. 59:617-45

Tognoli and Kelso *The Metastable Brain.* In *Neuron*, 81, Jan. 8 2014.

Lewis 2000 *The Promise of Dynamical Systems Approaches for and Integrated Account of Human Development.* In *Child Development* (2000), Vol. 71, No. 1. 36-43

Lewis 2005 *Bridging emotion theory and neurobiology through dynamic systems modeling*. In BEHAVIORAL AND BRAIN SCIENCES (2005) **28**, 169–245

Koziol et al. *Consensus Paper: The Cerebellum's Role in Movement and Cognition*. In *Cerebellum* (2014) 13:151–177  
DOI 10.1007/s12311-013-0511-x

Foglia and Wilson *Embodied Cognition*. In *WIREs Cogn Sci* 2013, 4:319–325. doi: 10.1002/wcs.1226

Anderson *Neural reuse: A fundamental organizational principle of the brain*. In BEHAVIORAL AND BRAIN SCIENCES (2010) 33, 245–313  
doi:10.1017/S0140525X10000853

Mercado (2008). *Neural and Cognitive Plasticity: From Maps to Minds*. *Psychological Bulletin*, 134: 109-137.

Friston *The Free Energy Principle: a unified brain theory?* In *Nature Reviews Neuroscience*. Jan 2010.

Garlick, D. (2002). *Understanding the nature of the general factor of intelligence: The role of individual differences in neural plasticity as an explanatory mechanism* *Psychological review*, 109: 116-136.

Vervaeke et al. *Relevance Realization and the Emerging Framework in Cognitive Science*. In *The Journal of Logic and Computation* 2012, 79-99.

Stanovich and West *Individual differences in reasoning: Implications for the Rationality Debate*. In *Behavioral and Brain Science* 2000 23, 645-726

## **COURSE POLICIES**

### **Academic Integrity**

All suspected cases of academic dishonesty will be investigated following procedures outlined in the [Code of Behaviour on Academic Matters \(https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019\)](https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019). If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, please reach out to me. Note that you are expected to seek out additional information on academic integrity from me or from other institutional resources. For example, to learn more about how to cite and use source material appropriately and for other writing support, see the U of T writing support website at <http://www.writing.utoronto.ca>. Consult the Code of Behaviour on Academic Matters for a complete outline of the University's policy and expectations. For more

information, please see [A&S Student Academic Integrity \(https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity\)](https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity) and the [University of Toronto Website on Academic Integrity \(https://www.academicintegrity.utoronto.ca\)](https://www.academicintegrity.utoronto.ca).

### **Missed Assignments/Special Medical Circumstances**

If you become ill and it affects your ability to do your academic work, consult me right away. Normally, I will ask you for documentation in support of your specific medical circumstances. This documentation can be an Absence Declaration (via ACORN) or the University's Verification of Student Illness or Injury (VOI) form. The VOI indicates the impact and severity of the illness, while protecting your privacy about the details of the nature of the illness. If you cannot submit a VOI due to limits on terms of use, you can submit a different form (like a letter from a doctor), as long as it is an original document, and it contains the same information as the VOI (including dates, academic impact, practitioner's signature, phone and registration number). For more information on the VOI, please see <http://www.illnessverification.utoronto.ca>. For information on Absence Declaration Tool for A&S students, please see <https://www.artsci.utoronto.ca/absence>. If you get a concussion, break your hand, or suffer some other acute injury, you should register with Accessibility Services as soon as possible. Please note that students can only use the Absence Declaration on ACORN *once per semester*. Documentation must be given to me within one week of missing a term test, in any of the forms mentioned above.

**LATENESS PENALTY: 5% per day up to a maximum of 50% off.**

**If you miss the final exam there is nothing that the TAs or I can do for you. You must contact your registrar immediately.**

### **Classroom Behaviour**

Please be respectful of your fellow classmates. Do not do anything that may disturb them such as carrying on a conversation, texting, playing games, checking social media, etc. Such behaviour is unacceptable.

### **Laptop and phone usage**

Technology can support student learning, but it can also become a distraction, to you and those around you. Out of respect for your fellow learners in this class, please refrain from using laptops and/or phones for entertainment or non-class related purposes (e.g. social media, email, surfing the web) during class and do not display any material on a laptop or phone which may be distracting or offensive to your fellow students. If you know you tend to use laptops or phones for other

purposes in class, please sit at the very back of the classroom so that those around you will not be distracted.

### **Lecture recordings and course materials**

Lectures may be recorded by students. These are only for the exclusive use of enrolled students, for their personal learning. If you are recording you **must** send me an email stating that you will only use the recording for course purposes, and you will share them with your fellow students upon request. I will not necessarily respond to this email.

Lecture recordings and course materials (including notes) are not to be shared in any way beyond enrolled students. Lectures and course materials are the intellectual property of the instructor and should be respected as such. You are not allowed to put course materials into the public domain, sell the materials, or give 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.

### **Re-marking policy - timeline and protocol**

If you would like to make a case for receiving a different mark on a graded assignment, please note that you have two weeks from the date an assignment is returned to you to submit the assignment for remarking. Absolutely no assignments will be re-graded beyond this time limit. Material submitted for remarking must be accompanied by a one-page written explanation detailing your reasons for why you think you should receive a different grade. Be as specific as possible (e.g. correction of addition errors in calculating a grade, a specific point or step that the grader missed, etc.). Note that in agreeing to resubmit your work for remarking, you are agreeing to a re-evaluation of the entirety of your work; your grade may go up, go down or stay the same.

### **Accommodations:**

#### **Students with Disabilities or Accommodation Requirements**

Students with diverse learning styles and needs are welcome in this course. If you have an acute or ongoing disability issue or accommodation need, you should register with Accessibility Services (AS) at the beginning of the academic year by visiting <https://studentlife.utoronto.ca/department/accessibility-services/>. Without registration, you will not be able to verify your situation with your instructors, and instructors will not be advised about your accommodation needs. AS will assess your situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work. Remember that the process of accommodation is private: AS will not share details of your needs or condition

with any instructor, and your instructors will not reveal that you are registered with AS.

### **Accommodation for Personal Reasons**

There may be times when you are unable to complete course work on time due to non-medical reasons. If you have concerns, speak to me. It is also a very good idea to speak with an advisor in your College Registrar's office; they can support you in requesting extensions or accommodations, and importantly, connect you with other resources on campus for help with your situation.

### **ACADEMIC RESOURCES**

#### **English Language Learners (ELL) Program**

<http://www.artsci.utoronto.ca/current/advising/ell>

ELL offers a range of programs/workshops/resources to assist all Arts & Science students who wish improve their English language skills (including reading, listening, speaking, and writing). Please see their website for more information about these resources.

Programs include:

- the Communication Cafe, which meets weekly at five different times and locations for the first seven weeks of each term for practice with oral skills like class discussion and presentations
- Reading eWriting, an online program that helps students engage course readings more effectively.

#### **Writing Help**

As a student here at the University of Toronto, you are expected to write well. The university provides its students with a number of resources to help them achieve this. For more information on campus writing centres and writing courses, please visit <http://www.writing.utoronto.ca/>.

- More than 60 Advice files on all aspects of academic writing are available at <http://advice.writing.utoronto.ca>

- There is also a series of workshops on different aspects of writing that may be especially helpful for your essays. Check out the dates at: <http://writing.utoronto.ca/writing-plus/>
- **NOTE: Writing Centres offer ONE-ON-ONE consultations – use the schedule at <http://www.writing.utoronto.ca/> to book your appointments for the semester now, as they get filled up quickly!**

### **Resources for Writing in APA Style**

- Free online resources from APA (e.g., FAQs, tutorials, etc.):
  - <http://www.apa.org/pubs/apastyle/>
  - <http://www.apastyle.org/learn/>
- Purdue Online Writing Lab (OWL) APA website:
  - <https://owl.english.purdue.edu/owl/resource/560/01/>

### **Additional Student Life Resources** <http://www.studentlife.utoronto.ca/>

In addition to Accessibility Services, there are many other programs, services, and resources that are available to U of T students to help with every aspect of “Student Life” This includes family resources, academic support, extracurricular activities, and more. Resources of particular interest may include:

- Health & Wellness: <https://studentlife.utoronto.ca/department/health-wellness/>
- Academic Success: <https://studentlife.utoronto.ca/department/academic-success/>