Syllabus

"Genes, Brain, and The Development of Mind"

Current Topics in Developmental Psychology

PSYD26

Winter 2010

Professor Laura-Ann Petitto

Tuesdays 3:00-5:00

Room: HW216

Instructor: Professor/Dr. Laura-Ann Petitto
Class Time: Tuesdays, 3:00pm-5:00pm
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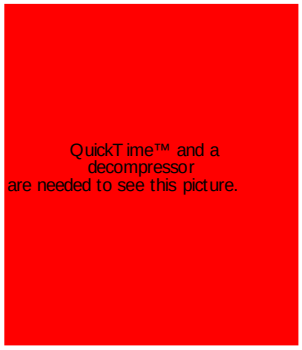
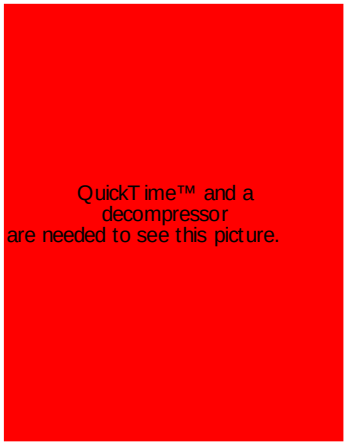




COURSE DESCRIPTION

In this advanced seminar we will explore a revolutionary new approach to the study of human development and the development of human higher cognitive capacities, called *"Cognitive Neurogenetics"* and "*Developmental Cognitive Neurogenetics*." This groundbreaking approach builds on the advent of innovative DNA Genotyping analyses of groups of genes that have been associated with aspects of higher cognition as well as Microchip array analyses. The approach joins 3 disciplines: *DNA Genotyping* and *Microchip array* analyses with the most advanced *Brain Imaging* technology from cognitive neuroscience and the leading *Behavioral* psycholinguistic and developmental methods from psychology. Together, the unification of these three disciplines under "one roof" affords the most stunning new lens into the evolution and nature of the human mind and brain to date, including human cognition, aspects of emotion and social behavior, language, reading and language disorders, math and numeracy, and creativity. Through exciting discussion, critical evaluation, and lively debate, the course will lay bare this

significant modern scientific advancement of thought and methods. It will further consider seriously its greater ethical and moral impact on society and the conduct of scientific inquiry.

REQUIRED READINGS

All of the required course readings can be found on Blackboard for downloading and printing.

BLACKBOARD

Blackboard will be your course "life line." It is where you will find most of the class readings to download, my general communications (e.g., my general announcements), as well as other course materials that were given out in class (e.g., syllabus, and handouts). This is where you will post Questions related to your student-led class presentations that you would like the class to think about – that is, the Questions that you will use to guide important class Discussions. This will be done using the "Discussion Board" feature. *Questions for student-led class Discussions must be posted no later than Thursday night (midnight) the week before you present*. Blackboard will also be a vital "virtual classroom" where class members may ask and answer each other's questions. Note: Please use only email for any direct questions for and/or communications with me (Professor Petitto).

> *Recommendation*: Immediately familiarize yourself with Blackboard and get in the habit of checking it regularly. If you are registered in the course, simply go to portal.utoronto.ca. Enter your UTOR ID and click on the course.

COURSE STRUCTURE

This course is designed with the most cutting-edge understanding of psychological principles of human learning and memory, involving, for example, how we learn best, how we remember best, and how we learn for life. Lecturing will be kept at a minimum. On most days, the class will consist of student-led discussions with the goal of promoting meaningful understanding, critical thinking, and deep learning of the material.

OBJECTIVES

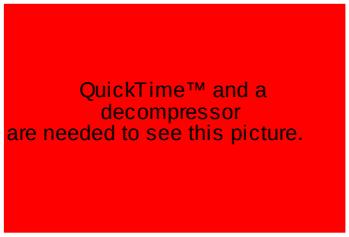
The primary objectives of this course are to *think* deeply about the material, to *develop critical reasoning skills*, and to *learn* the material in a way that stays with you for life. Why? Because the present course material is fundamentally about all of us—the complex factors that impact all human development—and it will reveal developments that we will witness in all young people of our species (be they our own children, children in our extended families, or children in the greater community). Indeed, the contents of this course will help us discover some of the secrets of what it means to be human—to be alive.

RESPONSIBILITIES

Your primary responsibility in this course will be to think, engage in serious critical reasoning, and to learn about the material at hand. I have a genuine passion for teaching and, as such, I try to think up ways to convey key course material so that you will

remember it for always. To this end, I've discovered some key ways to present our course material. To benefit fully from these techniques it is your responsibility to (i) read every assigned reading precisely on time (that is, before you enter each class), (ii) attend classes and fully participate in the activities and discussions, (iii) hand in Reflection Papers at the beginning of each class (save the class in which you present); do monitor Blackboard for class questions/announcements/developments, (iv) lead a class with a classmate, (v) write and present a Poster with a classmate. (Indeed, team work and the benefits it affords, called "distributed reasoning," are helpful to life-long learning, and, thus, are important in this class!)

GRADING POLICY (See below for details)



(i)	Reflection Papers	25%
(ii)	Class Attendance	10%
(iii)	Class Participation	15%
(iv)	Discussion Leadership	25%
(v)	Poster Presentation	25%

(i) Reflection Papers (Note: Do not hand in for week that you are leading the class.)

- Goals: To promote analytical thinking as well as the ability to synthesize disparate literature into a cogent and creative scientific argument. To promote exciting discussion and to convince me that you read and understood the paper(s).
- How: The content of this paper should include (a) an exceedingly brief statement of the overarching question/finding in the paper (e.g., not more than 2 sentences max). Said another way, do not waste space summarizing the article. Instead, provide a (b) critique/analysis of the findings and/or a critique/analysis of the author(s)' interpretation(s) of findings; and, (c) where relevant, this may include your discussion of an alternative idea or an alternative study/design. Do be sure to focus on your important critique and analysis of the ideas in the paper.
- Format: One (or two) pages MAXIMUM, double-spaced, 1" margins, 12-point "normal" font (such as, Arial, Times). Separately, you may include an additional page for References (should you read any additional articles; this is optional and non-required). Strict adherence to this page limit is obligatory. "Less is more."

(ii) and (iii) Class Attendance and Class Participation

- Goal: To ensure rich individual learning and rich group discussion
- How: I will keep a log throughout the term. Possible indices of good participation include coming to class (and coming on time), general willingness to participate in discussion and/or class activities, respect and kind manner towards the contributions of others when offering comments, offering constructive comments, feedback, and questions. Beware: We must avoid a situation whereby only a handful of people talk for the entire semester.

(iv) Discussion/Leadership

• Goal: To promote outstanding reasoning abilities, life-long learning, and exciting discussion; to promote more in-depth learning of specific course topics.

• How: Students will be selected by lottery to be a "Discussion Leader" for each of the classes listed below as a Student-Led Class/Discussion. Teams of approximately 2 students will constitute the "Discussion Leaders" for a given class. Discussion Leaders will (a) present a *brief* summary of the weekly readings, with the addition of the ONE outside reading that I provided, in addition to at least ONE extra outside reading that your team completed (T=2 extra readings, in addition to the readings assigned to the whole class), and (b) lead a creative and exciting class discussion. Please be sure to identify the outside reading to the class/me, making connections and supporting the additional insights gained by its inclusion. Recall that your class discussion *Questions* must be posted by Thursday night (midnight) of the preceding week. Be careful to meet, plan, and make certain that each team member is actively (and equally) involved.

• Format: Excellent presentation of ideas (and not just the idea itself) counts in science. Design your presentation such that the ideas are conveyed in a fascinating way that *promotes learning*. For example, design intelligent and poignant class activities that push class members to new conceptual understanding of the material. Think of ways to engage the class in active participation of a topic. Use of PowerPoint is permitted but only if done creatively; do not read your entire presentation straight from your PowerPoint slides (and, in general, do not read your presentation!). Break the class into smaller groups to gain new perspectives on the same issue. Be creative, but be careful not to be silly. TV show contests, and the like, should be avoided unless the ideas conveyed are absolutely riveting, apt, and presented in a sophisticated and thought-provoking way.

• Important Things to Do

- Make sure your entire team meets with me during my office hours at least one full week before your presentation. This is imperative.

- Make sure your entire team meets, practices together, and that all information is designed to be presented creatively in a well-timed and well-balanced manner. Help one another.

- If you use PowerPoint slides it is imperative that you post them on Blackboard for the class AND that you send a copy to my email address by MIDNIGHT on the day that you presented. If you can post your PowerPoint slides before the class, this would be even better.

- Feel free to speak with me should you experience any problems. We can always find a happy solution.

(v) Poster Presentation on a question that joins the 3 disciplines of *Genes, Brain, and Behavior*.

• Goal: To apply all that you learned throughout the course by designing an original Research *Proposal* to be presented in APA-style Poster Presentation format, in which you join the 3 disciplines of *Genes, Brain, and Behavior*, though you will not collect any data.

• Topic: The topic of your Research Proposal may be one of your choice in consultation with your partner(s). Specifically, you will be joined (through a lottery) with one or more people to form a team. Note: The topic of your Research Proposal may not be the same content as your student-led Discussion/Leadership presentation.
• How: Teams of approximately 3 students will work together to produce a poster ("Research Proposal"); preferably you will be joined with new team members (distinct from your Discussion/Leadership team). The Research Proposal will be to conduct a study of a particular topic or project, and will be presented in the form of a standard APA-style poster presentation (typical of professional conferences in the psychological sciences) in which you provide a crystal clear statement of the …

- Question (with appropriate background literature/rationale)
- Hypotheses and related Predictions
- Participants (and/or Participant Groups)
- Methods and Analyses
- Results* (expected, as per each of your Hypotheses/Predictions)
- Discussion/Conclusion (in which the significance/advance of your particular study is highly apparent). It should also be stated clearly (and/or be immediately apparent) how your question joined the 3 disciplines of *Genes, Brain, and Behavior*.
- References

*Said another way, you will provide at least two expected/possible research results, given your Hypotheses (with associated data analyses, as applicable). Moreover, in the Discussion section, you will briefly articulate what each of the possible "Expected Results" would imply, should they be found.

Note: Posters typically contain References that have been abbreviated. Thus, when you present both your Planned poster and your Final poster (see below), you will hand in a complete/full list of your References using APA-style. The list of References must show —at the very least— ten (10) outside references that you have personally read towards the completion of your final Poster.
• When: See below for date of our group discussion of each team's planned and final Research Proposal, as well as the date for the Poster presentation.

LATENESS POLICY

Lateness is not acceptable unless there is an officially documented medical or personal emergency. Please hand in all Reflection Papers, and all other items, exactly on time. Late items will be docked 10% for each day late. Thank you for your understanding.

STUDENTS WITH DISABILITIES

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. The UTSC AccessAbility Services staff (located in S302) are available by appointment to

assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or 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.

EMAIL POLICY

I do my best to answer email promptly but, alas, my daily volume is painfully high. I welcome you to stop by my office hours Mondays from 2:00-3:00pm. Should a question come up, I encourage you first to read the syllabus and our Blackboard site, try asking a classmate, and/or to post your question on the class Discussion Board. You'd be surprised to see how many times our questions are shared by other classmates. If the above doesn't work, either send an email or come to my office hours.

CLASS TOPICS & READINGS

*** = Student-Led Discussion**

Week	Class Date	Topic of Class	Actions
1	Jan 5	Introduction & Welcome to Class!	Presentation Lotteries! (a) Student Led Discussion teams (6) (b) Poster Presentation teams (~6) (c) Final Poster Presentation Day (Order: first ~ 3 teams, second ~ 3 teams)
2	Jan 12	Human Higher Cognition, Genes, Brain & Behavior • Know the basic goals/methods of the 3 different disciplines and the challenges of bridging different disciplines Read also to know… • Know Basic Genetics (What is a gene☺?) • Know Basic Genetic Approaches • (If you still don't understand after reading the articles then <u>you</u> must look this up on your own and come to class prepared to discuss very intelligently.) • Know basic Cognitive Neuroscience/Brain Imaging Approaches • Know basic Behavioral measures • Explore legitimate websites on genetics (e.g., Genetics Home Reference)	<u>Hand in</u>: Reflection Paper <u>Read</u>: (i) Goldberg & Weinberger (ii) Green, A.E. et al., 2008 (iii) Fossella & Casey (Optional only: Karmiloff-Smith)
*3	Jan 19	Human Higher Cognition, Genes, Brain & Behavior • Attention, Memory, and Higher	<u>Hand in</u>: Reflection Paper <u>Read</u>:

		Cognition	(i) Posner, et al (ii) Espeseth, et al. (iii) Egan, Kojima, et al. +(iv) For presenters only: Plomin, et al.
*4	Jan 26	Language, Genes, Brain & Behavior -I • The great debate! Could there be a genetic basis for human language?	Hand in: Reflection Paper Read: (i) Fisher, (ii) Enard, et al., (iii) Konopka et al., (iv) Dominguez & Rakic, (v) Rujescu, et al., +(vi) For presenters only: Vargha-Khadem, et al.
*5	Feb 2	Language, Genes, Brain & Behavior -II • Language and Reading Disorders – Dyslexia • Language Disability, Transient & Persistent Language Difficulties	Hand in: Reflection Paper Read: (i) Fisher & Francks (ii) Spinath, et al. (iii) Bishop, et al. (iv) Liégeois, et al. +(iv) For presenters only: van der Lely & Ullman
*6	Feb 9	Emotion & Social Behavior, Genes, Brain & Behavior • ADHD • Depression in Children • Cognitive/Emotional attention deficits • Other Social qualities like being monogamous or not!	Hand in: Reflection Paper Read: (i) Waldman, et al. (ii) Kaufman, et al. (iii) Canli, et al. Read also very short Newspaper articles (not for Reflection Paper): (iv) Anthes +(vi) For presenters only: Walum et al. Optional: Raz et al.
7	Feb16	Reading Week: No classes	

*8	Feb 23	Math & Numeracy, and Human Creativity Genes, Brain, Behavior • Math, Numeracy, Dyscalculia • Creativity Genes • Polymorphisms associated with Creative Dance	Hand in: Reflection Paper Read: (i) Ansari & Karmiloff-Smith (ii) Reuter, et al. (iii) Bachner-Melman, et al. Read also very short Newspaper articles (not for Reflection Paper): (iv) Henderson (v) Connor +(iv) For presenters only: Berens, Nelson, Petitto, and Dunbar
9	Mar 2	RESEARCH PROPOSAL CLASS DISCUSSION/EVALUATION: Teams present *planned* Research Proposal ideas (no Posters today). Presentation Length: 5 minutes. TIME YOURSELVES, and 5 minutes for class questions & answers (T=10 minutes per team). TIME YOURSELVES. Please come on time to begin promptly at 3:00 and to end at 5:00. Out of respect for your peers, please plan on keeping to this timetable. Thank you.	(i) Hand in: Each team to hand in today a written, 1-page description of research topic with (separately) a planned list of the 10 references to be read. (ii) Peer-Evaluations Hand in (during class): Research Proposals Feedback Forms
*10	Mar 9	Ethical & Moral Consideration, Genes, Brain, Behavior • What are the ethical and moral considerations? • Are they insurmountable? Explore the not-so-legitimate sites (think "outside the box," e.g., consider the social implications of genetic+brain+behavior research in light of "designer baby" websites, etc.)	Hand in: Reflection Paper Read: Greene & Haidt, 2002 Greene, J.D. et al., 2001 and Nusslein-Volhard
11	Mar 16	POSTER PRESENTATION PREPARATION	Individual Teams meet
12	Mar 23	POSTER PRESENTATIONS of your Research Proposals. First half of class will present today with their Posters. Presentation Length: 10 minutes (TIME YOURSELVES), with 10 minutes for class questions & answers (T=20 minutes per team). Come several minutes before 1:00pm	Hand in: Teams who present hand in their final Poster, plus *final* list of the 10 References that were read. Peer-Evaluations Hand

		to set up so as to begin precisely on time. Polished, articulate oral presentations are expected of visually compelling posters. Do not read from poster. Professionalism always. Please take this activity seriously. It is both part of (i) the "learning for life" process and (ii) your professional training in psychological reasoning.	in (during class): Poster Presentation Feedback Forms Dress: Conference Appropriate Refreshments: Provided by alternate week's presenters
13	Mar 30	POSTER PRESENTATIONS of your Research Proposals. Second half of class will present today with their Posters. Presentation Length: 10 minutes (TIME YOURSELVES), with 10 minutes for class questions & answers (T=20 minutes per team). See additional notes above (March 23). *** *Summary & Integration* • Question: Utility of this scientific revolution for Society?	Hand in: Teams who present hand in their final Poster, plus *final* list of the 10 References that were read. Peer-Evaluations Hand in (during class): Poster Presentation Feedback Forms Dress: Conference Appropriate Refreshments: Provided by alternate week's presenters

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