PSYC23: Developmental Psychobiology

Meetings: Webcast 24 hours/7 days a week

Professor
Dr. David W. Haley
Office: Science Wing (SW) 564
Office hours: Fridays, 12:00–2:00 pm

Course Website
Blackboard, U of T Portal
(http://portal.utoronto.ca/)

Course texts
The course readings are available on the course website.

Overview

The study of developmental psychobiology uses multiple perspectives to study the development, psychology, biology, and evolution of human behavior. The research discussed in this course will highlight and compare human and animal models to shed light on how social relationships and biological mechanisms interact and contribute to mental health.

Basic and Applied Science

Although much of the course content and many of the assignments are concerned with basic science, it is important to consider questions about how this work applies to everyday life. Are some individuals more sensitive to their environments than others? Can individuals exposed to early adversity or chronic stress "catch up," or are they scarred for life? Can the practices and institutions of society (policies, laws, schools, parenting, etc.) be used more effectively to optimize human development?

Evaluation

Applied science assignment (weekly)	20%
Mini research proposal draft due June 10	5%
Mini research proposal final due July 22	15%
Term exam (TBD; either June 22 or 29)	25%
Final exam (TBD)	35%
Extra credit	2%
Total	**102%**

Applied Science Assignment (weekly)

For this short weekly written assignment, I ask you to think more broadly about the course material. Each week, please identify a question or problem in society that relates to the weekly reading and that illustrates how the course content can be applied. Describe what the question or problem is and how it relates to the course content in one to two

sentences. In addition, provide a source or reference for it that highlights or provides insight into the problem or question raised. A source or reference can be a web link or an attachment containing a newspaper, magazine, or journal article. This assignment should be submitted through Blackboard and is due each week on Tuesdays at 10:00 p.m.

For example, if the week's reading is on the topic of child abuse, you might raise the question of spanking and whether spanking is abusive. You then could search for a relevant source or reference on the web or in the library. For example, you might have seen a recent news story about a Wisconsin man charged with felony child abuse after spanking his 8-year-old son. You could use this story as your source, providing a link or including it as an attachment. Please note, for the first two weeks that have multiple readings you may focus on one of the readings for your assignment.

Examples of Reading Topics and Applied Questions:

- Child Abuse: Should spanking be criminalized?
- Stress: Are schools doing enough to reduce stress?
- Support for Parents: Should parents be given more generous parental leave? Why?
- Fetal Alcohol Exposure: Should pregnant women be criminalized for performing actions (such as drinking alcohol) that have the potential to harm the fetus?

An Example of the Applied Science Assignment

Course name: Developmental Psychobiology
Weekly topic: Child abuse
Your Name: Example Student
Your student ID #: 00000000

Question: Is spanking abusive?

Discussion: In the weekly course reading, Teicher (2002) discusses the effects of physical and sexual abuse but does not address the question of whether spanking is a form of physical abuse, which has received attention in the news. The following story describes a Wisconsin father charged with felony child abuse for spanking his young son.

Source: http://fox11online.com/2014/12/10/wisconsin-father-charged-with-felony-child-abuse/

Mini Research Proposals

The mini research proposal is designed to help you explore and consolidate course material into a meaningful written narrative and to improve your scientific thinking and writing. More specifically, the objective is to produce a research proposal that you write up as a 250-word abstract. Every word counts! During the semester we will spend

time discussing each concrete step you need to take and each question you need to answer to write this research proposal: What is a research topic? What is a literature review? What is a hypothesis? What are methods and measures? How does one test a hypothesis?

*Rough Draft***:** You will have an opportunity to submit a complete draft of your mini research proposal so that you can get feedback before being graded on it.

Final Draft: Based on earlier feedback, complete and submit your final mini research proposal.

An Example of the Mini Research Proposal Assignment

Course name: Developmental Psychobiology
Title: Racism Leaves Epigenetic Marks on Infant Stress Receptor Genes
Your Name: Example Student
Your student ID #: oooooooo

*Background and rationale***.** Racial discrimination is linked to racial health disparities in adults and children [1]. Although the impact of racism on biological systems engaged in the stress response has been demonstrated in pregnant women and their infants [2], it is unclear how maternal stress produced by racism is transmitted to the infant. One possibility is that infants mirror the mother's stress by means of emotional contagion, a phenomenon that has been demonstrated in the context of negative social evaluations [3]. A second possibility is that early adversity reduces the quality of parenting and alters the epigenetic programming of the infant stress receptor gene [4], both of which may be exacerbated by exposure to racism.

Hypothesis. We hypothesized that infants of mothers exposed to greater racism would show greater epigenetic marks on their stress receptor genes.

Methods. Mother-infant dyads (N = 300) were recruited from a community centre when infants were six months of age. To measure racial discrimination in mothers, the Experiences of Discrimination (EOD) questionnaire [5] was administered. To measure epigenetic marks, saliva samples were obtained from the infant using a saliva kit and shipped to a lab for analysis [4]. An ANOVA was conducted on infant epigenetic marks with maternal group (high and low discrimination) as the between subjects factor. Socioeconomic status (SES) was statistically controlled for in our analysis.

Significance and implications. If we find that epigenetic mechanisms in the infant are affected by the stress of racism on the parent, our understanding of the subtle intergenerational effects of racism will be enhanced. [1]

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[1] References

[1] Williams, D. R., & Mohammed, S. A. (2009). Discrimination and racial disparities in health: evidence and needed research. *Journal of Behavioral Medicine, 32,* 20-47.

[2] Thayer, Z. M., & Kuzawa, C. W. (2015). Ethnic discrimination predicts poor self-rated health and cortisol in pregnancy: Insights from New Zealand. *Social Science & Medicine, 128,* 36–42.

[3] Waters, S. F., West, T. V., & Mende, W., B. (2014). Stress Contagion: Physiological Covariation Between Mothers and Infants. *Psychological Science, 25,* 934–942.

[4] Oberlander TF, Weinberg J, Papsdorf M, Grunau R, Misri S, et al. (2008) Prenatal exposure to maternal depression, neonatal methylation of human glucocorticoid receptor gene (NR3C1) and infant cortisol stress responses. *Epigenetics* 3, 97–106.

[5] Krieger, N. Smith, K., Naishadham, D., Hartman, C., Barbeau, E. M. (2005). Experiences of discrimination: validity and reliability of a self-report measure for population health research on racism and health. *Social Science & Medicine, 61,* 1576–1596.

Term and Final Exams

The term and final exams will consist of true/false (30%), multiple-choice questions (40%) and figure labeling questions (30%). The exams are based on both the readings and lecture material. A brief review session will be held in class before each exam.

Missed Term Exam: Since the final exam is cumulative, if you miss the term exam, the final will be reweighted automatically from 35% to 60%. There are no make-up exams.

Missed Final Exams: Professors and TAs are not authorized to negotiate changes to the final exam schedule. Please consult the university calendar for more information.

Extra Credit (up to 2%): Generating your own exam questions and preparing answers for them is a good way to learn the course material. Accordingly, from anyone who would like extra credit, I will accept three exam questions, each of which should be accompanied by a ¼- to ½-page answer; these questions must be received by me no later than one week prior to the midterm or final exam. For more information about this option, please speak to a TA. I will grant up to (and a maximum of) 2% extra credit to students who complete these assignments for both the midterm (1%) and final (1%) exams.

Lectures, Slides, and Readings

The schedule given at the end of this syllabus details the lecture topics and readings for each week.

You are responsible for reading all of the assigned articles. Some but not all of the material in the lectures is also in the readings; also, there is material in the readings that is not covered in lectures. Although the organization of the lectures is independent of the readings, reading assignments are placed next to the lecture for which they are most relevant. It is strongly recommended that you do the reading assigned for a meeting *before* the meeting.

PowerPoint slides for the lectures will be posted on Blackboard in advance. The slides contain all the important material from the lecture for which you are responsible, and they are made available for your convenience and to enhance your learning of the material. If you try to learn the material only by reading the PowerPoint slides and do not come to (or watch) lecture, you will miss explanations, illustrations, and elaborations that enhance understanding and retention of the course material. Similarly, if you come to (or watch) lecture without having done the reading, you'll be less able to follow the lecture.

A good way to consolidate your knowledge and understanding of the material is to 1) attend and or watch all classes and take notes; 2) print out the PowerPoint slides of the lecture after class and compare your notes with them, so that you can see if you are catching all the important information in your note-taking; and 3) look in the assigned readings for material corresponding to the lecture—keeping in mind that not all material covered in lecture is in the articles (and vice versa).

Course Website

I will make the syllabus and all readings, lecture notes, announcements, and exam review materials available on the course website (log in to the U of T Blackboard portal at https://weblogin.utoronto.ca/). Please check this website regularly for announcements and messages. Also, please ensure that your current e-mail address is correctly linked to your Blackboard account.

Getting Help with Course Materials

If you are struggling with the course material, you should come to my office hours, send an e-mail to your TA, or set up a special time to meet and discuss the matter. The worst things you can do if you are struggling are to fail to ask for help, stop coming to class, or give up trying. If you have questions that are not answered in this syllabus or on the course website, you may post the question in the online discussion forum (on Blackboard; see above), bring the question to the TAs' weekly office hours, or discuss it with me during my office hours. You may also send an e-mail message to one of our TAs, but please allow *two working days' time* for a reply. Major questions relating to course content can be addressed in far greater depth in person.

Access*Ability*

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the Access*Ability* Services Office as soon as possible. I will work with you and Access*Ability* Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC Access*Ability* Services staff (located in S302) are available by appointment to assess specific needs, provide referrals, and arrange appropriate accommodations. They can be reached at (416) 287-7560 or ability@utsc.utoronto.ca.

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/policies/behaveac.htm) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offenses. Potential offenses 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:
-Using or possessing unauthorized aids
-Looking at someone else's answers during an exam or test
-Misrepresenting your identity

In academic work:
-Falsifying institutional documents or grades
-Falsifying or altering any documentation required by the University, including (but not limited to) doctors' notes

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see http://www.utoronto.ca/academicintegrity/resourcesfor students.html).

Schedule of Lectures and Readings

May 6 / Week 1: Syllabus and Overview

May 13 / Week 2: Adverse Childhood Experiences

Center on the Developing Child at Harvard University Working Paper #1: *Young children develop in an environment of relationships* (2004).

Center on the Developing Child at Harvard University Working Paper #2: *Children's Emotional Development Is Built into the Architecture of Their Brains* (2004).

May 20 / Week 3: Biological Embedding

Center on the Developing Child at Harvard University Working Paper #3: *Excessive Stress Disrupts the Architecture of the Developing Brain* (2005).

Center on the Developing Child at Harvard University Working Paper #9: *Persistent Fear and Anxiety Can Affect Young Children's Learning and Development* (2010).

Center on the Developing Child at Harvard University Working Paper #10: E*arly Experiences Can Alter Gene Expression and Affect Long-Term Development* (2010).

May 27 / Week 4: Friending, Freaking Out, and Giving Up

Sapolksy, R. (2003). Taming stress. *Scientific American,* 86-95.

June 3 / Week 5: Dyadic Stress and Reparation

Haley, D. W. & Stansbury, K. (2003). Infant Stress and Parent Responsiveness: Regulation of Physiology and Behavior During Still-Face and Reunion. *Child Development, 74,* 1534 – 1546.

June 10 / Week 6: Hidden Regulators of Attachment *

Mini Research Proposal Drafts due today

Hofer, M. A. (2006). Psychobiological roots of early attachment. *Current Directions in Psychological Science, 15,* 84-88.

June 17 / Reading Week

June 24 / Week 7: The Parental Brain

Rilling, J. K. & Young, L. J. (2014). The biology of mammalian parenting and its effect on offspring social development. *Science, 345,* 771–776.

July 1 / Week 8: No lecture (Mini Research Proposal Drafts released after exam)

July 8 / Week 9: Child Abuse

Teicher, M. H. (2002). *Scientific American,* 68-75.

July 15 / Week 10: Executive Function

Cuevas, K. (2014). What's mom got to do with it? Contributions of maternal executive function and caregiving to the development of executive function across early childhood**.** *Developmental Science 17,* 224–238

July 22 / Week 11: Sleep *

David R. Euston *&* Hendrik W. Steenland. Memories getting wired during sleep. *Science, 344,* 1087–1088.

Mini Research Proposals (final) due today

July 29 / Week 12: Infant Memory

Haley, D. W. (2013). Infant memory consolidation. Chapter 11 in *The Infant Mind: Origins of the Social Brain* edited by M. Legerstee, D. W. Haley, & M. H. Bornstein.