RESEARCH OPPORTUNITY PROGRAM
299Y/399Y PROJECT DESCRIPTIONS 2019-2020
SUMMER

Name and Title: Dr. Meg Schlichting, Assistant Professor
Department: Psychology

TITLE OF RESEARCH PROJECT: How Does the Developing Brain Remember?

Number of 299Y Spots: 1  Number of 399Y Spots: 1

OBJECTIVES AND METHODOLOGY:
Recent research suggests that in the healthy young adult brain, related memories can become connected to form so-called integrated memories that span specific experiences. These memories are supremely flexible in that they can support our ability to make new decisions that do not depend on just one isolated experience; yet, they might also distort our experiences by pulling together or pushing apart memories according to their complex relationships. How and when in development does this tendency emerge? Due to immaturity of the underlying brain structures (including most notably the hippocampus and prefrontal cortex), it might be the case that memories formed by children and adolescents are qualitatively different from those formed by adults—namely, memories might go from being rigid but veridical in childhood to flexible yet distorted in adulthood. The proposed research project will further investigate this possibility, lending key insights into how the nature of memories might shift over the course of development.

The primary methodology involves computer- and paper-based tasks in which we will measure participants’ accuracy, response time, and/or mouse movements to assess their memory. Initially some research will be conducted in young adults, and will subsequently be adapted for use in children or adolescents and/or for brain imaging experiments (functional/structural MRI or NIRS).

DESCRIPTION OF STUDENT PARTICIPATION:
We are looking for ambitious and dedicated students who are looking to gain hands-on research experience in a developmental cognitive neuroscience laboratory. Students will dedicate 10 hours per week to lab-related work, and should have regular availability on at least one weekend day. Due to the fluctuating demands of participant scheduling and testing, some flexibility in hours is desirable. Students will work closely with their research mentor (e.g., a graduate student, postdoctoral fellow, advanced undergraduate or lab manager) and/or the faculty supervisor and be involved in various stages of the research process, including some of the following activities:

1) Participating in lab meetings, including discussion of the student’s research focus in the lab, discussion of other projects and research issues in the lab, and discussion of theoretical questions and the findings of empirical papers.
2) Recruiting and scheduling child, adolescent, and adult participants in experiments and assisting with behavioural and/or MRI data collection. It is highly desirable that interested students are comfortable working with children and adolescents.

3) Contributing to experimental design, data analysis, and results interpretation.

4) Developing computer programming skills (e.g., using MATLAB or Python) by creating experimental tasks and/or analyzing data. Some students may gain exposure to fMRI data analysis packages. Prior computer programming experience is preferred but not mandatory.

5) Gaining valuable scientific communication skills by writing research reports, preparing data for publication, and giving oral presentations.

MARKING SCHEME (assignments with weight and due date):

Lab participation (40%): A substantial portion of the grade will be based on participation in the lab. This includes attendance and contribution to weekly lab meetings, and conducting research in an efficient, effective, and professional manner. Students will be expected to keep a weekly log of hours and activities, to be turned in to the faculty supervisor for grading halfway through, deadline July 1, 2019 and at the end of the program, deadline August 15, 2019. Students will receive regular feedback as to their performance in the lab through individual meetings with the faculty supervisor.

Midterm report (10%): Students will write a 2-page midterm report detailing their research experience up to this point by the deadline July 1, 2019.

Presentation (20%): Students will give a 20-minute presentation of the project findings at lab meeting by the deadline August 15, 2019.

Final project (30%): Students will either prepare a scientific poster for presentation at the annual Faculty of Arts and Science 299 Research Fair OR write a final paper (approximately 6-8 pages) in the form of a scientific article. The paper should include Introduction, Methods, Results, and Discussion sections. Turn in your poster or paper via email to the faculty supervisor by the deadline August 15, 2019.