

Summer Research Assistant for Projects Focused on Understanding Suicide Risk

Project & Job Description:

Introduction: The advertised position is a rich opportunity for students to get involved in research aimed at solving a devastating problem: youth suicide. Students will get hands-on experience with several aspects of the research process, including project design, data processing and coding, and analysis.

Overview and History of the Projects: Suicide is the 2nd leading cause of death among Canadian youth and rates have been rising in recent years. Dr. Stewart has devoted his career to better understanding which youth are at risk to attempt suicide and why some youth act on their suicidal thoughts (i.e., make attempts) while most others do not.

Past Research: For 4 years as a post-doctoral fellow and faculty member at McLean Hospital and Harvard Medical School, Dr. Stewart ran an intensive study of youth hospitalized for suicidal behaviours. Among the aims of this project was to better understand the contribution of negative interpersonal experiences (e.g., bullying) to suicidal thinking and actions. These types of stressors often precede suicide attempts, but we know little about the mechanisms linking these events to suicide outcomes.

To address this gap, Dr. Stewart employed two data-rich approaches. First, he conducted rigorous interviews with all patients to collect information about the major life stressors they experienced prior to hospitalization. To use this information, these interviews must be condensed into "vignettes" describing circumscribed life stressors (e.g., "16-year-old female breaks up with her partner") that are then rated by several research assistants using rules in a comprehensive manual. Dr. Stewart is an expert in this interview and rating system (the Life Events and Difficulties Schedule [LEDS]).

Second, Dr. Stewart designed a novel paradigm to study how adolescents process perceived rejection (i.e., another teen not wanting to speak with them) in the brain using electroencephalography (EEG) techniques. EEG can be used to make inferences about psychological phenomena that occur outside of conscious awareness (e.g., 150 ms after information is presented) and thus presents a really exciting way to learn more biases in information processing (e.g., greater encoding of negative versus positive events) that could put teens at risk for suicide.

Current Directions. In July 2018, Dr. Stewart began his appointment as Assistant Professor in the Department of Psychology at Queen's University and founded the Queen's Emotions and Risky Behaviours in Youth (QuERBY) Laboratory. The lab is launching a major project in January 2022 that will still be in the data collection phase over the summer (PROJECT 1). There are also several projects that have recently been completed, and there are opportunities to get involved with data cleaning, organization, and preprocessing (PROJECT 2 and 3).

PROJECT 1: We are using eye tracking to study gaze behavior when viewing suicide relevant images. We think that patterns of viewing in our paradigm may be related to the capability to enact potentially lethal self-injury. This may lead to the identification of an object, implicit measure of suicide risk. We have completed an initial study that recruited 150 young adults; we collected eye tracking data, clinical information, and re-assessed them at two additional time points. We are launching a SSHRC-funded effort to extend these findings; it was delayed by COVID-19 and data collection will launch in January 2022. Further, some of our current work is focused on refining the stimuli (i.e., images of people making suicide attempts) that we use in our eye tracking studies. We are developing and testing an online analogue of eye tracking with Dr. Tom Armstrong (Whitman College) and Dr. Edwin Dalmaijer (Cambridge University) and this will continue over Summer 2022.

PROJECT 2: Gender diverse individuals experience particularly high-rates of suicidal behaviours; consequently, preventing suicide in this group is an urgent health priority. The project examined the impact of gender minority stress (e.g., gender-related victimization) on suicidal thinking and actions over time. Data collection for this project was recently completed and SWEP work on this project could involve cleaning the data, merging assessment collected over four time points, and exploring the impacts of negative health experiences on the trajectory of suicide-related outcomes.

PROJECT 3: The QuERBY Lab is very interested in how neuropsychological factors (e.g., disinhibition; decision-

making; set-shifting) may contribute to suicidal behaviour. We have investigated this general question in two projects. First, a QuERBY Lab graduate student is administering a comprehensive battery of behavioural tasks that tap aspects of state impulsivity to determine which impulsivity domains may be most tied to suicidal behaviour. This work will be wrapping up by the end of 2021. There will be high data processing/organization demands that a SWEP student could help address. Second, we have been conducting studies on a relatively new paradigm called the Criticism Gambling Task (CGT). Many suicide theories generally suggest that suicidal behaviours are preceded by overwhelming pain and negative affect; these intense states are proposed to impact decision-making. Our studies examine how people make decisions in the context of audio criticism. By Summer 2022, we will have completed a large, multi-site investigation of the CGT, and (depending on resources and student interests) may be designing projects to extend our work based on preliminary outcomes.

Project 1: Gaze behavior and suicide risk

1. Recruit participants through phone calls, emails, social media, flyers, etc.
2. Run all study protocols. For in-person (SSHRC funded) research, this includes administering brief demographic interviews, questionnaires programmed in Qualtrics, behavioural tasks and our eye tracking protocol. We are also collecting data using Smartphone apps; students will be responsible for monitoring participants over a 21-day period wherein participants complete surveys 5 times daily.
3. Data coding, cleaning, and preliminary analyses.

Project 2: Online longitudinal study of suicide risk among gender diverse people

1. Preliminary data cleaning, variable coding, and analyses
2. Assist with grant proposal writing and/or research ethics submissions for new projects

Project 3: Neuropsychological factors implicated in suicidal behavior

1. Data cleaning, coding, and preliminary analyses.
2. For people with programming/computational skills: running computational models on behavioural responses using R/Python/Matlab.
3. Assist with research ethics submissions for new projects; online data collection for new projects if applicable.

Required Qualifications

1. TCPS 2: CORE (Course on Research Ethics) certificate, per Queen's policy.
2. Students must be signed up in the Tools for Research at Queen's (TRAQ) system.
3. Students must sign confidentiality agreements for both the QuERBY Lab and the Queen's Psychology Clinic.

Desired Qualifications

Academic

1. Courses in clinical and/or developmental psychology; coursework in cognitive neuroscience
2. Course in statistics and/or research methods

Technical

1. Experience with any of the following software: MATLAB, PsychoPy, Python, Brain Vision Analyzer 2, E-Prime, Open Sesame, Gorilla
2. Experience with statistical and data management software, including SPSS, R, and/or Qualtrics
3. Training in the LEDS system

Professional

1. Experience working in research settings
2. Office administration experience

Project Impact: The QuERBY Lab applies innovative approaches to gain new insight into risk factors for suicide attempts. SWEP students will be involved in projects that have implications for accurately identifying youth at risk for suicide; ultimately, this may inform targeted prevention to improve the health of young Canadians and curb loss of life. The QuERBY Lab's research agenda is in line with the Human Health and Wellness theme within Queen's University's Strategic Research Plan, particularly the areas of Neuroscience and Mental Health. Finally, Dr. Stewart has mentored over 40 undergraduate students and is committed to training the next generation of suicide scientists. SWEP students will receive one-to-one mentorship and are encouraged to stay involved with the lab beyond the summer.

Learning Plan::

Learning Environment. SWEP Students working in the Queen's Emotions and Risky Behaviours in Youth (QuERBY) Laboratory will be immersed in the science and practice of clinical psychology. Dr. Jeremy G. Stewart adopts an apprenticeship model in training all laboratory members. This means that SWEP students will work closely with Dr. Stewart as they are initially trained and will receive regular feedback and support as they execute their duties. This approach scaffolds students towards increasing levels of independence and responsibility over time. Students of all levels are encouraged to provide their input into lab decisions and activities; ultimately, this creates a vibrant, collaborative environment wherein trainees are optimally setup to expand their knowledge and develop diverse technical skills.

Dr. Stewart is committed to tailoring the SWEP duties to fit the goals and interests of the successful applicants; skills and experiences gained will vary accordingly. Nonetheless, a non-exhaustive list of what could be gained by students working in the QuERBY Lab is presented below. The learning outcomes are organized by various roles that SWEP students may adopt over the summer.

1. Life Events and Difficulties Schedule (LEDS) Vignette Writer

(a) Learn about different ways to conceptualized life stress, and particularly, about how to use objective, contextual information to measure stress severity

Opportunities/Activities Provided: Students will undergo intensive LEDS training with Dr. Stewart, a leading expert in contextual stress assessment with over a decade of experience. Training will involve didactics describing the literature on life stress and psychiatric disorders, as well as introducing the LEDS system.

(b) Learn about the lives of youth and young adults with psychiatric illness

Opportunities/Activities Provided: LEDS interviews are detailed accounts of the interviewees life experiences in a circumscribed time period. As such, they provide a detailed window into the lives of youth with psychiatric illness. Students will learn more about these individuals and deepen their capacity for understanding and empathy.

(c) Write vignettes based on LEDS recordings

Opportunities/Activities Provided: Students will apply their training in the LEDS to creating sets of vignettes brief descriptions of the objective, contextual details of stressors. Students will think critically about information that must be included to rate the severity of the stressor. They will receive ongoing feedback on their vignettes and are expected to improve iteratively by learning through experience.

(d) Present writing vignettes to a group of LEDS raters; lead rating meetings

Opportunities/Activities Provided: All vignette writers present vignettes to a team of 2-3 raters . Vignette writers run the meeting: they keep the raters on task, resolve disagreements between raters, and record data. They are responsible for upholding the integrity of the LEDS rating system (e.g., independent ratings of stress severity).

Comment: Being trained in the LEDS is an exceptional and unique learning opportunity. This is considered the gold-standard approach to life stress assessment, but the Department of Psychology at Queen's is one of only a handful of sites in North America with experts who use this approach.

2. Electroencephalography (EEG) Data Analyst

NOTE: There are EEG data available from Dr. Stewart's prior work at McLean Hospital and his collaborations with Dr. Randy Auerbach's lab at Columbia University.

(a) Develop introductory background and theoretical knowledge relevant to EEG (e.g., EEG physics, neurophysiology, neuroanatomy, and cognitive neuroscience)

Opportunities/Activities Provided: To contextualize their practical duties, SWEP students in this role will receive a didactic "crash course" in background and theory relevant to processing EEG data from Dr. Stewart.

(b) Learn to pre-process raw EEG files and prepare them for analysis

Opportunities/Activities Provided: Students will work in Brain Vision Analyzer and learn a stepwise approach (called a processing stream) to preparing raw EEG files for analysis. This detail-oriented work requires students to recognize eye artifacts (e.g., blinks), large movement artifacts, and "bad channels" (those with no electrical signal) and make decisions about removing them. Dr. Stewart will provide continuous supervision and feedback, and students will make increasingly independent decisions over the course of the summer.

3. Eye Tracking Specialist (Project 1)

(a) Receive an introduction to using eye tracking to measure gaze behaviour. Learn how to run eye tracking studies with Open Source Software (e.g., PsychoPy; Open Sesame)

Opportunities/Activities Provided: Students will execute laboratory procedures for recording gaze behaviour, including providing instructions, using custom chin rests, and calibrating the machine.

(b) Learn about eye tracking by processing data

Opportunities/Activities Provided: Students will work alongside Dr. Stewart to pre-process, clean, and visualize gaze data. This may include creating figures or running basic preliminary statistics.

4. Online Survey Research Specialist (Project 1)

(a) Learn how to conduct literature reviews. Learn about how people may develop the capability to engage in suicidal behaviour

Opportunities/Activities Provided: Students will review the literature to contextualize their work on Project 1, which focuses on suicidal capability

(b) Monitor participant responses in Qualtrics

Opportunities/Activities Provided: Students will be trained to use Qualtrics by QuERBY staff. They will spot check survey responses, download data, send reminders for follow-ups, and perform preliminary statistical analyses.

(c) Assist with online advertisements where needed.

Opportunities/Activities Provided: Students will create and distribute impactful advertising across social media platforms.

(d) Assisting in safety monitoring

Opportunities/Activities Provided: Students will learn how to review Smartphone responses to key measures. Where appropriate, they will flag moments of high risk and notify Dr. Stewart; they will send resources in response to moderate risk.

5. Programmer / Behavioural Task Specialist (Project 2/3)

(a) Analyze existing behavioural task data

Opportunities/Activities Provided: Students can assist in importing, merging, cleaning and analyzing participating data from behavioural tasks relevant to impulsivity and/or executive functioning. For those with programming backgrounds, there are opportunities to use computational modeling to investigate task performance parameters.

(b) Behavioural task programming

Opportunities/Activities Provided: Students may learn to edit and/or design behavioural tasks in Inquisit (license available through Department of Psychology), Python, E-Prime and/or Gorilla. Dr. Stewart's collaborators (Drs. Armstrong and Dalmaijer) are eager to collaborate with students in learning stimulus design using Python or Gorilla.

6. QuERBY Lab Member

(a) Learn about research and treatment relevant to adolescent suicide

Opportunities/Activities Provided: SWEF Students will attend weekly QuERBY meetings which feature discussions of lab research, student projects, important papers on the topic of suicide in youth, and national/international events that inform our efforts.

(b) Practice describing research findings in a supportive setting.

Opportunities/Activities Provided: SWEF Students will be invited to do a presentation for the QuERBY Lab. This could be based on their SWEF activities or a piece of written work (e.g., scientific article).

(c) Become involved in efforts to support the community and ultimately, eliminate suicide.

Opportunities/Activities Provided: The QuERBY Lab is developing a website and social media presence geared to informing and supporting the local and national community. Students will be invited to contribute blog entries (e.g., what they learned during their summer SWEF) or other components (e.g., resources).

Uniqueness. Although suicidology is a growing field, there are still few scholars housed in Canadian psychology departments conducting research on suicidal thoughts and behaviours. The blend of experimental methods (e.g., eye tracking to directly capture attention), robust clinical characterization, ecological momentary assessment (via

intensive Smartphone surveys), and longer-term follow-ups also presents a rare opportunity to understand suicidal thoughts and behaviours at multiple levels (e.g., moment-to-moment, within days, across months). This types of rigorous investigation is necessary given the complexity of suicide-related outcomes, and how far we have to go before we are able to effectively help people in suicidal crisis.