New York Six
Upstate Summer Research Fellows Program

AVAILABLE RESEARCH POSITIONS, SUMMER 2019:

Please review the list of research positions available to identify a project of interest. In your application, you will identify your preference and provide a brief statement of interest. The online application portal is found here: https://newyork6.wufoo.com/forms/z22xx0p1k4m1af/ or through the New York Six website at newyork6.org.

Projects

PROJECT 1

Reducing Impulsive Choice Behavior in Humans

Faculty Mentor: Adam Fox
Academic Department: Psychology
Institution: St. Lawrence University

Project Description: In St. Lawrence County alone, there were 12 opioid deaths, 48 opioid-related emergency room visits, and 17 opioid-related hospitalizations in 2016.[1] As the opioid crisis has grown in Northern New York, and across the United States, it is becoming increasing important to find effective behavioral treatments that might help mitigate drug use and increase treatment efficacy.

One behavioral process that underlies all substance abuse is "steep delay discounting." In short, steep delay discounting is defined as a strong, durable preference for smaller, sooner rewards (i.e. drug) over larger, later rewards (i.e. a paycheck, health, family). In other words, for individuals who exhibit steep delay discounting behavior, delays reduce the value of rewards *more* than for control subjects. They are less willing to wait. Not only does steep delay discounting predict substance abuse, it is also associated with obesity, pathological gambling, and risky sexual behavior, among others—this has led researchers to define steep discounting as a "trans-disease process" that underlies all of these maladaptive behavior patterns.[2]

Therefore, reducing preference for smaller-sooner rewards may have far reaching clinical implications for treating substance abuse, like opioid addiction. One effective treatment for decreasing preference for smaller-sooner rewards in rats is called "delay-exposure training." Delay-exposure training involves exposing rats to repeated, extended delays to food reward. Doing so results in significant decreases in preference for smaller-sooner rewards, and significant increases for larger, later rewards.[3] However, one shortcoming of this research is that it has not been extended to humans, greatly reducing its clinical value and potential to help treat substance abuse. The proposed objective of this summer research fellowship is to fill this research gap.

The primary aim of the proposed research is to test effects of delay-exposure training on human delay discounting of monetary rewards. We will do so by imposing delays before each question in a monetary delay discounting task (where participants will make choices between smaller, sooner amounts of money and larger, later amounts of money), and compare performance to a control group completing the task without the imposed delays. Our findings may have far reaching implications for the treatment of substance abuse and would be the first to show that delay-exposure training might work the same for humans as it has been shown to in rats.

Responsibilities of the Research Fellow: The research fellow will take a primary role in the research. After appropriate training, the fellow will participate in experimental testing, data collection, data analysis, and dissemination of the research findings (e.g., presentations at research conferences). The fellow will work alongside the Principle Investigator (Dr. Adam Fox) and other SLU summer research students in the lab. We also engage in career building exercises (e.g., CV building, graduate school discussions, etc.) and

scientific writing practice (e.g., working on a manuscript reporting our results) during the summer fellowship period.

Desired Qualifications: The fellow should have an interest in Psychology and/or Behavioral Neuroscience. Course work in these areas is desirable—especially research methods courses. Laboratory experience is also a plus, but not a necessity. We will provide the necessary training on site (there may be some online training the fellow can complete beforehand).

Is IRB Approval Needed?

Yes; we currently have approval for similar work and will submit an IRB application specific to this work when/if we get approval for the fellowship. Since we have had a lot of this research approved in the past, we anticipate no problems with IRB approval to conduct the work.

Proposed Start and End Date for the Fellow: June 4 to July 30, 2018 (8 weeks total)

References:

1. New York State Department of Health. (2017). Opioid Annual Report for 2016. Retrieved from https://www.health.ny.gov/statistics/opioid/data/pdf/nys_opioid_annual_report_2017.pdf

2. Bickel, W. K., & Mueller, E. T. 2009. Toward the study of trans-disease processes: A novel approach with special reference to the study of co-morbidity. J. Dual Diag. 5, 131-138. //doi.org/10.1080/15504260902869147

3. Fox, A. E., Visser, E. J., & Nicholson, A. M. (2019). Interventions aimed at changing impulsive choice in rats: Effects of immediate and relatively long delay to reward training. *Behavioural Processes, 158,* 126-136. doi.org/10.1016/j.beproc.2018.11.009

PROJECT 2

Small Mammal Trapping to Explore Stable Isotope Analysis for Tick Host Identification

Faculty Mentor: Kathleen LoGiudice
Academic Department: Biology
Institution: Union College

Project Description: Tick-borne diseases are a major public health concern in many parts of the world. Despite considerable study, many aspects of basic tick ecology remain imperfectly understood. One aspect still under debate is exactly which species serve as the most important hosts for black-legged ticks (*Ixodes scapularis*). For example, some work[1] indicates that white-footed mice (*Peromyscus leucopus*) host the most larval ticks while other work[2] has found that shrews (*Blarina* and *Sorex* spp.) are far more important hosts. Although there have been many attempts, an ideal technique has not yet been developed that can identify the prior host of flat, host-seeking ticks. My lab is working to develop such a technique using stable isotope analysis (SAI). A better understanding of host use may lead to ecology-based strategies to reduce human disease risk.

Stable isotope analysis, which is commonly used to identify trophic position, should help to clarify tick feeding relationships. This technique is in early stages of development for use with ticks.[3] Isotopes of carbon ($^{13}C/^{12}C$) and nitrogen ($^{15}N/^{14}N$) are typically used to investigate animal diets, and allow us to distinguish carnivore from omnivore from herbivore based on the isotopic signature of tissues.[4] Several researchers have demonstrated that isotopic profiles of ticks after stadial transition reflect those of host tissues[5] suggesting that the C/N isotopic ratios of tick hosts may be distinct enough to identify the species from which a flat tick took its most recent bloodmeal.[6] This idea assumes that 1) each host species has an isotopically unique diet in nature, and/or 2) there are mechanisms of host species' metabolism that result in differential isotopic fractionation, leading to unique isotopic ratios for different species regardless of dietary similarity.

Protocol: In late summer, 2019, we will live-trap small mammals that typically host black-legged ticks. We will target eastern chipmunks (*Tamias striatus*), white footed mice (both granivore/omnivores) and short-tailed and smoky shrews (insectivores). Traps are typically set in the evening and checked early in the morning, however we may do some nocturnal trapping to target shrews, which cannot be left in traps all night. Pregnant and lactating females will be released immediately and other animals will be transported to the Union College Vivarium and held in cages for up to 7 days, after which they will be taken back to the capture site and released unharmed. While in captivity, animals will be infested with nymphal black-legged ticks and fed isotopically distinct diets in order to test the hypothesis that short term changes in host diet can impact the isotopic signature of ticks feeding on them. This is a follow-up to work that my students and I recently published.[7]

In the lab, students will care for animals and collect ticks as they engorge and drop off. The ticks will be catalogued and held until molting at which point they will be submitted to the Union College Stable Isotope Lab for analysis. We will investigate whether isotopic signatures of the ticks are affected as animals from the same species eat different diets and animals from different species eat the same diets. This will help to answer the question of whether metabolic differences between the host species drive differences in tick isotopic signature or whether these differences are dependent solely on the host diet.

Our goal is to assess the feasibility of collecting a tick from the wild and using SAI to determine its last host. If time allows this summer, I also intend to develop a laboratory protocol to test ticks for tickborne diseases using polymerase chain reaction (PCR) and then submit the tick remains for SAI. If successful, this will allow us to determine whether a tick is infected with a human pathogen and what host species it fed upon. This will give us a better and less biased technique with which to understand the importance of each host species in driving enzootic cycles and the impact of host community composition on tick-borne disease risk.

Although the overarching questions of this project are pre-determined, student researchers have ample opportunity to ask their own questions and make a part of the project their own. We will collect a lot of data about host permissiveness to feeding ticks (feeding success, mass at engorgement, molting success, etc.), natural larval body burdens, host community composition, etc. My summer students typically develop a question of their own and present their research in a formal venue on campus or elsewhere. In addition, they have the opportunity to co-author any papers that come out of their research efforts.

Responsibilities of the Research Fellow: The successful fellow will join a small team of students conducting the research described above. This work involves long hours, often in hot and humid conditions. In the lab, students will be trained to care for animals and learn to identify signs of stress and respond appropriately. I have an excellent record of success keeping animals in captivity, but there is always the possibility that an animal could die, so the fellow must be emotionally prepared for this possibility. Students will be required to work some weekends doing animal care

Desired Qualifications: The fellow should be comfortable hiking, carrying a moderate weight pack (20-30 lbs) and working in forested areas, possibly at night. I will accompany students at all times if we engage in nocturnal trapping. We work in secure locations and take many safety precautions, especially with regard to tickborne diseases. Students should be in good physical condition, comfortable with the out of doors and willing to be trained in the safe handling of small mammals and ticks. Both in the field and in the lab, students must be careful observers, organized and precise, with good attention to detail. I am looking for good natured, team players who are able to enjoy working hard. Finally, it is essential that students carefully follow protocols for personal safety and animal care. Compassion for animals is essential.

Proposed Fellowship Dates: We will work for 6 to 8 weeks from late July to early September. The exact dates will be determined later and will take into consideration the start dates of any students from other NY6 schools. Union College begins on September 11, 2019, although I realize that other schools are likely to begin earlier.

References:

[1] e.g. LoGiudice et. al. 2003.PNAS 100:567–571.
[2] e.g., Brisson et al, 2008. Proc. R. Soc. B. 275:227–235.
[3] Schmidt et al. 2011. Ticks Tick Borne Dis. 2:225–227; Hamer et al. 2015. J. Med. Entomol. 52: 1043–1049.; LoGiudice et al. 2018. Ticks Tick Borne Dis. 9:151-154.
[4] Fry, B., 2006. Stable Isotope Ecology. Springer, NY (ISBN: 0-387-30513-0).
[5] Schmidt et al. 2011; Hamer et al. 2015; LoGiudice et al. 2018.
[6] Hamer et al. 2015.
[7] LoGiudice et al. 2018.

PROJECT 3

New Connections and New Community
2019 C.A.R.E. (Community Action, Research, & Education) Fellowship

Faculty Mentor: Leah Rohlfsen
Academic Department: Sociology
Institution: St. Lawrence University

Project Description: The C.A.R.E. program is designed to provide students with a full-time, residential experience in a comfort care "home for the dying." C.A.R.E Fellows spend 8 weeks engaged in a structured educational program involving service and research. Previous C.A.R.E. Fellows report increased empathy and self-efficacy (Weisse, Melekis, & Hutchins, 2018). Indeed, NY6 support has played an important and integral role in funding opportunities for students to better understand the challenges of providing end of life care to terminally ill members in rural communities. While these experiences have been fulfilling and valuable for all those involved, we propose a new model with a new home. Hospeace House in Naples, NY has very few young volunteers and wants to have a C.A.R.E. Fellow. At the same time, St. Lawrence University does not have a regular relationship with a comfort care home. Previous NY6 funding has been used to support partnerships between Union and a home in Scotia, and between Skidmore and the homes in Ballston Spa and Saratoga. I would very much like to build a relationship with Hospeace House and pilot a new model of the C.A.R.E. Fellowship with a NY6 student.

Previously, a student designed and implemented agency driven research. That research was not determined until the student's placement began in June after consultation with the agency. This meant IRB approval could not be obtained and limited the possibilities for research. Furthermore, the timeline left very little time for the research and in some cases, meant the research process and outcome could not be completed as envisioned. As the advisor, I plan to offer the C.A.R.E. Fellow the opportunity to engage in their choice of pre-determined research topics. With this model, the student can hit the ground running with one of several pre-designed research topics agreed upon in advance with the agency. As a result, we expect the research to be more valuable to the student, the agency, and the faculty. While preliminary, choices for research projects include:

- An in-depth understanding of volunteer expectations and experiences, including recruitment and retention of volunteers, and the experience of volunteers that are no longer at the home.
- A qualitative and quantitative examination of live discharges from the comfort care homes.
- An examination of correspondence and communication between family, volunteers, and the agency.

Upon completion, students will be able to:

- Contribute to a research project that meets a pre-determined agency-identified need.
- Identify the unique challenges and burdens placed on caregivers;
- Recognize the importance of psychosocial support in end-of-life care;
- Demonstrate compassionate, non-judgmental, empathetic care that preserves a resident's dignity at the end-of-life;

- Have an increased comfort communicating with terminally ill residents and their family members.
- Identify symptom management approaches for conditions common at the end of life including pain, dementia, anxiety, nausea, edema (swelling), and dyspnea (difficulty breathing);
- Serve as a member of an interdisciplinary health care team model and recognize the value provided from different healthcare professionals.

Benefits also include gaining 250+ hours of clinical experience (direct patient contact), education and training in palliative care, and a stipend ($3,800 for 8 weeks) to replace earnings from summer employment and to be used toward room and board.

Responsibilities of the Research Fellow: C.A.R.E. Fellows will be performing a variety of activities during the program, including providing direct bedside care to terminally ill residents. Fellows will:

- Choose from pre-designated research areas to address and advanced an agency driven need and present that research to the agency and other NY6 summer Fellows;
- Work as a member of a caregiver team that includes, staff at the home and volunteers from the community;
- Serve as surrogate family members responsible for direct, hands-on care of residents' needs including assisting with activities of daily living (toileting, feeding, taking medications, etc.);
- Observe hospice care team members and resident care staff;
- Offer emotional support to residents, family members and friends visiting residents;
- Provide resident care narratives and carefully document care decisions;
- Maintain a reflective journal based on field notes taken after each shift;
- Complete 10 experiential learning modules with readings and clinical vignettes that require written narratives reflecting on various topics including caregiving experiences, communication, cultural competency, and issues surrounding death and dying.

Desired Qualifications:

- Must be a student from a NY6 school from the class of 2020-2021 who can commit to the full (30 hrs/week) program from June 17th-August 9th;
- Must complete a 2-day volunteer training program
- Must complete 10 on-line learning modules and develop and implement a research project(s) that will benefit the home;
- Should have an interest in healthcare or social work (exceptions considered) but could be from any academic discipline;
- Must have an interest in working with people during the last few weeks or months of their lives and be able to carry out resident care duties;
- Must complete application, letter of intent, and submit reference letters by deadline;
- Must make full-time commitment and be able to work daytime, night, evening, and weekend shifts that could begin as early as 6:50 am and end as late as 11:00 pm (schedule will vary week to week). Therefore, applicants cannot have other commitments (i.e. additional summer research, classes, employment elsewhere etc.).

Proposed Fellowship Dates: June 17-August 9, 2019