# Undergraduate Research Symposium May 18, 2018 Mary Gates Hall

# Online Proceedings

## POSTER SESSION 1

**MGH 258, Easel 192**

*11:00 AM to 1:00 PM*

**Testing the Validity of the Photo Emotion Differentiation Task**

*Shwetha Hariprasad Sanapoori, Junior, Biochemistry*
*Mentor: Tonya Palermo, Anesthesiology and Pain Medicine*
*Mentor: Rachel Aaron, anesthesiology*

The ability to regulate emotion does not develop completely until young adulthood, meaning teenagers are at risk for disorders associated with difficulties in regulating emotions. Identifying one's emotions is essential for taking active steps towards regulating them; thus emotion differentiation is an essential skill that facilitates psychological well being. Although there have been multiple questionnaires developed to assess emotion differentiation, there are limitations of self-report. Behavioral tasks provide an opportunity to observe an individual's ability to identify emotions. The Photo Emotion Differentiation (PED) task is a computer task designed to assess emotional differentiation, validated predominantly in adult populations. Participants are shown 20 standardized emotional images and are asked to report the intensity with which they experience each of the 19 listed emotions. The limitation to this method is that it has only been used once in child populations. We aim to validate the PED for use in adolescents by comparing it to a self-report questionnaire [the Levels of Emotional Awareness Scale for Children (LEAS-C)] that assesses emotion differentiation. The instructions for the LEAS-C ask youth to respond to 12 scenarios by indicating how they might feel and how the other person in the scenario might feel. A validated scoring system is used applying specific criteria to the emotion words used in the response. This is an ongoing study and we have currently recruited 14 participants from ages 13 to 16 who will come for a lab visit and complete both the PED and the LEAS-C. A positive correlation between the scores from the PED and LEAS-C will show that the PED is measuring the construct of emotion differentiation and can be used to obtain valid assessment in youth in subsequent studies. With this information, the PED can be used to examine the relationship between pain and emotion differentiation in adolescents.

## POSTER SESSION 1

**Balcony, Easel 105**

*11:00 AM to 1:00 PM*

**Evaluation of Stock Selective Fishing Tools in the Lower Columbia Sub-basin**

*Mary Valentine, Sophomore, Marine biology, Grays Harbor Coll*
*Mentor: Amanda Lyn Gunn, Science and Math Division, Grays Harbor College*
*Mentor: Adrian Tuohy, Wild Fish Conservancy*
*Mentor: Aaron Jorgenson, Wild Fish Coservancy*
*Mentor: Justin Eastman*

In the Pacific Northwest the Endangered Species Act (ESA) protects wild salmonids from commercial fishing. The current commercial fishing gear, including gill nets but not limited to, disrupts the recovery of these species because fishermen can not selectively harvest the hatchery fisheries without wild salmonids as bycatch, which have high mortality rates. Once ESA quotas are met this can effectively shut down commercial fisheries. The exploration of alternative fishing tools that can select for certain species will lower bycatch mortality rates of ESA species, and in turn allow commercial fisheries to operate longer. On August 26th through September 29th of 2017 Wild Fish Conservancy conducted follow up research, to a 2016 pilot study of Pound nets, in the Lower Columbia River Sub-Basin. Post release survival rates were evaluated in a modified stock selective pound-net. Using Mark Recapture methodology, with a Passive Integrated Transponder (PIT) tags, and genetic clippings for later analysis. Survival rates of control specimen to treatment specimen were captured as they traveled past dams upstream. Data analyzed were total catch, catch per unit effort and covariates of recapture probabilities. The preliminary results show that fishing with stock selective nets can effectively target hatchery fisheries while successfully releasing ESA listed species, reducing mortality rates. In 33 days WFC and a local fisherman captured and released 7,129 salmonids with a post release survival for steelhead and trout ( *Oncorhynchus Mykiss*) of 94.0%, and 96.6% for Chinook salmon (*Oncorhynchus Tshawytscha*) listed as ESA species. Hatchery fisheries of these species along with coho salmon (*Oncorhynchus kisutch*) were effectively selected with viable commercial quantities. Future subset data of genetic clips and a Jolly-Seber analysis will give more precise information of these post-release survival esti-

mates.

# SESSION 1D

## MARINE ECOLOGY AND FOOD WEBS

*Session Moderator: Bonnie Becker, Environmental Science (Tacoma)*

**MGH 228**

*12:30 PM to 2:15 PM*

* Note: Titles in order of presentation.

**Effects of Male Coercion in Bottlenose Dolphins (*Tursiops aduncus*) on Female Foraging Behavior**

*Elizabeth Marina (Liz) Allyn, Senior, Aquatic & Fishery Sciences*

*UW Honors Program*

*Mentor: Janet Mann, Biology, Georgetown University*

*Mentor: Aaron Wirsing, Environmental and Forest Sciences*

*Mentor: Megan Wallen*

In the population of bottlenose dolphins (*Tursiops aduncus*) in Shark Bay, Australia, groups of two or three adult males form long-term alliances that sequester, harass, and intimidate adult females, presumably to increase their chances of mating success. Costs that males inflict on females include physical injury, changes in home range and habitat use, reduced foraging, and changes in calf care. Although altered female behavior is evident during association with males, the direct impact males have on female behavior is not entirely clear. That is, male behavior and female responses to such behavior during consortships have not been explicitly documented. A long-term study has collected detailed behavioral data on the Shark Bay population since 1988. Using this dataset, this project will quantify the rate of male aggression directed at females and how female activity budgets and foraging tactics change in response. Preliminary work indicated that rates of received aggression were higher for cycling females than non-cycling females, and higher when females were in the presence of more than one male, potentially confirming that males use aggression to coerce reproductively viable females. Females also spent less time foraging when in the presence of more than one male, hinting at potential costs to the female owing to loss of food. Because females have highly specialized foraging tactics, changes in foraging behavior and home range during prolonged or repeated consortships could impact female condition.

## POSTER SESSION 3

**Balcony, Easel 106**

*2:30 PM to 4:00 PM*

**Student Perceptions of Neuroplasticity: A Classroom-Based Growth Mindset Intervention**

*Caitlin Ann Konya, Senior, Psychology*

*Erin Claire Mc Ree, Senior, Psychology*

*Mentor: Aaron Lyon, Psychiatry and Behavioral Sciences*

*Mentor: Mylien Duong*

*Mentor: Jessica Coifman, SMART Center - Psychiatry & Behavioral Sciences*

At one point or another, every student is faced with some sort of academic failure that can in turn have negative impacts on self-esteem or future academic performance. Being able to overcome such obstacles requires resiliency and the ability to view failure as a learning opportunity. Growth Mindset (GM) interventions aim to shift a student's perception of intelligence as a quality that can be developed over time and enhance their approach to overcoming barriers. Originally, the GM was developed as an evidence-based intervention to be delivered by trained professionals. However, bringing this intervention into the real-world calls for a more feasible and accessible model. To bridge this gap, the current study utilizes the role of teachers as a valuable resource in building capacity within schools to attain sustainable, long-term goals regarding student success. The purpose of our research is to explore how a GM intervention delivered by teachers affects students' beliefs about the brain's ability to change (neuroplasticity). This project utilized a randomized control design with longitudinal follow-up to evaluate the efficacy of the GM intervention in comparison to curriculum as usual delivered in a rural district in the Pacific Northwest region. At two separate time points, middle and high school students completed an online self-report survey that assessed three constructs: theory of intelligence (whether intelligence can be changed), effort beliefs (the relationship between effort and outcomes), and learning goals (goals towards improving academic abilities). We hypothesize that students assigned to the intervention would show more positive implicit attitudes towards malleable intelligence, beliefs about effort, and learning goals. By understanding how students view themselves within an educational context, we can improve the measures taken to further engage and empower students. Future research should evaluate the quantitative outcomes of academic performance (i.e. grade point average) in relation to a GM intervention.

## POSTER SESSION 3

**Balcony, Easel 94**

*2:30 PM to 4:00 PM*

**Calibration of $Z_eff$ diagnostic on the HIT-SI**

*Kuan Wei Lee, Sophomore, Physics: Comprehensive Physics*

*Mentor: Aaron Hossack, Aeronautics and Astronautics*

Nuclear fusion power is one of the best candidates for the next generation of energy. It has many desirable properties such as

producing more energy than fossil fuels per kilogram of fuel, zero carbon emission, and producing no long-lived radioactive waste. Therefore, nuclear fusion power is worth pursuing and it has been studied for decades. One of the critical issues in nuclear fusion research is the impurity contamination. The impurities released from plasma-facing components through various plasma-wall interactions can lead to dilution of the fusion fuel. Therefore, it is very important to study impurity content and behavior. The impurity level is an important parameter in the research of magnetically confined plasma and can be quantified by the ion effective charge, $Z_{eff}$. Ion effective charge can be derived from bremsstrahlung emissivity from the visible spectrum radiation of plasma. The objective of this project is to set up a calibrated system that yields high precision in measuring bremsstrahlung emissivity. It is important to absolutely calibrate the system because impreciseness of bremsstrahlung emissivity measurements gives the inaccurate values of $Z_{eff}$. In our calibration, a Stabilized Halogen Light Source (SHLS), integrating sphere, and a photodiode are used. We collimate the light from SHLS and send it to the integrating sphere through fiber optics. The light in the integrating sphere is captured by a photodiode and a telescope and is transferred to current and voltage signal respectively. Our goal is to get the correct calibration factor that will give us correct values of bremsstrahlung emissivity measurements.

## POSTER SESSION 3

**MGH 258, Easel 184**

*2:30 PM to 4:00 PM*

**Community Member Retrieval on Social Media using Textual Information**

*Shobhit Ketanbhai Hathi, Senior, Computer Science (Data Science)*
*Mentor: Mari Ostendorf, Electrical & Computer Engineering*
*Mentor: Aaron Jaech, Electrical Engineering*

This project addresses the problem of community membership detection on social media using only text features in a scenario where a small number of positive labeled examples defines the community. For example, if we are given the tweets of chess grandmasters, then the community is defined as chess grandmasters, and the model we propose should identify people likely to be chess grandmasters. We introduce user embeddings (dense vector representations of the users) trained on an unsupervised proxy task: user re-identification. Experiments with 16 different communities show that the resulting embeddings are more effective for community membership identification than common unsupervised representations, measured both by average AUC and 1/MRR measure.

## POSTER SESSION 4

**MGH 258, Easel 179**

*4:00 PM to 6:00 PM*

**The Relationship Between Wildfire and the Cascading Impacts of Predators on Plants**

*Hannah Mckown Booth, Senior, Environmental Science & Resource Management (Wildlife Conservation)*
*UW Honors Program*
*Mentor: Aaron Wirsing, Environmental and Forest Sciences*
*Mentor: Apryle Craig, School of Environmental and Forest Sciences*

Predators exhibit top-down effects on plant communities by altering the abundance and behavior of their herbivore prey. Disturbance regimes such as wildfire may impact the strength and nature of these interactions and their corresponding effects on plant communities. In 2015, wildfires burned through areas in northeastern Washington impacted by the recolonization of gray wolves (*Canis lupus*) and inhabited by their two main prey species, mule deer (*Odocileus hemionus*) and white-tailed deer (*O. virginianus*). We are using data collected in burned and unburned areas across wolf-impacted and wolf-free sites to explore the relationship between recent wildfires and the effects of predators on plants. Data on plant species presence, percent cover, and browsing extent within each plot and associated controls will provide an index of browsing intensity and plant species selection by deer. Our preliminary analysis contrasts plant percent cover as a function of fire, wolf-presence, and measured landscape variables. Our findings will yield a better understanding of the top down effects of predators like wolves in areas like the American West that are predicted to be increasingly affected by wildfire.