WCU
WEST CHESTER
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# COLLEGE OF THE SCIENCES AND MATHEMATICS

## Spring Research Day 2019

Special thanks to:

- Dr. Duane Milne, Political Science
- Sigma Xi
- CSM Dean's Office
- Faculty Judges

# Graduate Student Posters

1. **Jordan Mark Barbone and Geeta Shivde**
   **Department of Psychology**

**The effects of participant-selected background music on executive function task performance**
Previous research studying the effects of background music on cognition have been inconsistent in how the specific music stimuli were chosen, as well as the specific cognitive tasks used. In the present study, a survey of undergraduates demonstrated that research in this area should use music stimuli and cognitive tasks that are more ecologically valid. An experiment informed by the survey results shows few differences in students' performance on executive function and abstract reasoning tasks when listening to self-selected music, randomly selected music or silence. The results of this study point to possible improvements in methodologies that can strengthen the conclusions in this field of research going forward.

2. **Kelsey Blum, Kelly Bradley and Deanne Zotter**
   **Department of Psychology**

**Perceptions of a Feminist-Empowerment-Relational Eating Disorder Prevention Program**
Perceptions of a feminist-empowerment-relational (FER) eating disorders prevention program were assessed via focus groups. Women participating in the program discussed their perceptions of the goals and effectiveness of the program. Analyses revealed themes of education/awareness and empowerment, supporting the effectiveness of the FER model.

3. **Kelly Bradley, Adessa Flack, Zachary Getz, Malatesta, Jessa Malatesta, Veronica Still, Kenia Valdez, Ariana Zahn and Stevie Grassetti**
   **Department of Psychology**

**La Escuela Charter School Needs Assessment 2019**
The current evaluation summarizes a thorough needs assessment conducted as part of an academic service-learning graduate course. A team of WCU graduate students provided a program evaluation service to a local elementary school while meeting weekly to discuss the academic underpinnings of Program Evaluation. La Escuela* is a new dual language charter elementary that opened in 2014. As such, administrators are exploring which programs may be most useful to their students and faculty. Therefore, the impetus for the current needs assessment was to identify and understand the top unmet needs of the school so that La Escuela may use this assessment to 1) select programs to address unmet needs, 2) guide planning for program implementation, and 3) serve as a "baseline" comparison standard in the future. The needs assessment team used multiple methods to thoroughly assess the needs of La Escuela. These methods included an archival data review, analysis of parent reports, interviews with administrators, focus groups with teachers, and classroom observations. Results of the needs assessment suggest that the current greatest needs at La Escuela are 1) support for managing tier 2 behavioral concerns in the classroom setting, 2) services that meet the needs of dual language learners and their family, and 3) enhanced stress management. Conclusions will include an extended discussion of recommendations in the areas of academics and curriculum, school environment, parental engagement, and classroom management. This presentation may serve as a guide for future efforts for community-engaged courses, research, and clinical work at WCU.

4. **Zachary Getz and Michael Gawrysiak**
   **Department of Psychology**

**Mindfulness and Prescription Drug Misuse (PDM) Among College Students: Examining Associations Between Trait Mindfulness, Environmental Suppression, and PDM Among College Students**
College student prescription drug misuse (PDM) is associated with a range of consequences and heightens risk for substance use disorder. Research implicates mindfulness as a protective factor and aversive experiences as risk-factor for PDM. However, these variables have not been well examined among college students. This study examined PDM, trait mindfulness, and environmental suppression among college students ($N$=176) completing surveys for course requirements. The Five Facet Mindfulness Questionnaire and the Environmental Suppression subscale from the Reward Probability Index assessed aversive experiences. The Non-Medical Use of Prescription Drugs Questionnaire

assessed PDM during the preceding year. Hypotheses included PDM students would demonstrate lower trait mindfulness and higher environmental suppression relative to non-PDM; and among PDM students, mindfulness and environmental suppression would significantly associate with misuse severity. PDM students ($n$=48) primarily indicated stimulant misuse ($n$=35), followed by anxiolytics ($n$=22), opioids ($n$=15), and sedatives ($n$=4; $n$=19 indicated poly use). Results suggested PDM students had lower trait mindfulness ($t$(174)=-2.12, $p$=.036) and greater environmental suppression ($t$(174)=-4.02, $p$<.001) relative to non-PDM. Trait mindfulness negatively associated with frequency of anxiolytic use ($r$=-.372, $p$=.009), but was not significantly associated with other medication usage. Environmental suppression positively associated with frequency of anxiolytic ($r$=.308, $p$=.017) and sedative use ($r$=.284, $p$=.025), but was not significantly associated with other medication usage. These findings underscore the adaptive role mindfulness may play as a protective factor and highlight the role environmental suppression may play as a risk factor. Expanded discussion focuses on these variables relevance in modifying treatment approaches to target at risk college students.

**5. Jessa Malatesta, Mallory Garnett, Zachary Weaver, Savina Lawrence, Kelsey Munster, Jean-Philippe Laurenceau and Eleanor Brown**
**Department of Psychology**

**Arts-Integrated Preschool Relates to Lower Cortisol for Children at Risk via Poverty**

Income poverty and correlated stressors tax physiological systems that respond to stress, as indexed by the hormone cortisol. This physiological tax relates to cognitive, emotional, and physical health problems for children facing economic hardship. A recent study by our lab suggested physiological benefits of arts classes for children attending Head Start preschool. The present study examines salivary cortisol across the preschool day and change across the year for children attending an arts-integrated versus typical Head Start.

The arts integrated Head Start included in the daily schedule multiple music, dance, and visual arts classes, whereas the comparison Head Start included more limited integration of arts activities into regular homeroom classes. The two preschools were geographically proximate and matched on family demographic characteristics as well as key indicators of program quality such as teacher training and teacher-to-child ratio.

A repeated-measures MANCOVA assessed the impact of time of year (start, middle, and end) and preschool type (arts-integrated versus comparison) on child salivary cortisol output across the preschool day, with demographic covariates. Results suggest that child cortisol output across the day was statistically similar for the two preschools at start-of-year but that significant differences emerged midyear and became more pronounced by year's end. Children at the arts preschool ultimately showed lower cortisol production. Arts programming may help to lower stress levels for young children facing economic hardship.

**6. Mary Ann Blumenthal, Zachary Weaver, Keriann Mosley, Alyssa Allen, Dominique McQuade, Amelia Oberholtzer, Jacqueline Redmond and Eleanor Brown**
**Department of Psychology**

**Learning With Music: Early Childhood Program Associated with Advantage in Self-Regulation**

School success depends on the ability to regulate emotions, behavior, and attention in the service of learning. The present study examines the impact of MacPhail's Learning with Music Program on the development of self-regulatory skills for young children at risk via economic hardship.

In Learning with Music, MacPhail music teachers visit partner preschool classrooms 24 times across the year and model music integration for early childhood educators. The present study used an experimental waitlist control design to examine the impact of Learning with Music on children's self-regulatory skill development. The study spanned three years and included three preschools, matched on geographic location, participant demographics, base curriculum, and quality ratings. Participants included 183 preschool children, 143 of whom received MacPhail's Learning with Music program and 40 of whom did not.

Trained research assistants administered individual child assessments of the inhibitory control aspect of self-regulation, as well as child verbal ability at the start, middle, and end of a year of preschool attendance. Core analyses involved latent growth curve modeling to examine initial status and growth in child inhibitory control as a function of receipt of MacPhail's Learning with Music Program. Results indicated that, over and above the impact of demographic covariates, MacPhail's Learning with Music Program was associated with greater growth across the preschool year in the inhibitory control aspect of self-regulation. The present study highlights opportunities for using music

programming to ameliorate negative effects of poverty and promote the development of important self-regulatory skills for young children.

**7. Dmitriy Grechkin and Si Chen**
**Department of Computer Sciences**

**UltimatePass: A Secure and Open-sourced Password Generator**

Today, people store a lot of private information on the Internet that can be considered by malefactors as an object of trade. Typically, internet providers of variable services use algorithms to encrypt the data. However, there is one thing that does not depend on providers – user's passwords. User is responsible for the complexity of the password. User all around the world faces the same problem: How to create a secure and easy to remember password? A random sequence of characters is hard to remember, especially if the user tries to create a unique password for each account. There are a lot of passwords generators in the network, but there is no guarantee that this application is able to generate a password that is secure enough. In this project, we built an open-source secure password generator name UltimatePass. Our password generator application allows the user to choose what kind of password to generate and where to store the password. This password generator application provides to the user various options for the generation of the password such as length, custom set of special symbols, or even generate of passwords from English words that can be memorized easily and stores the file with passwords on the user's machine in encrypted form. Moreover, our password generator works fast and does not require any additional libraries or installations, and all needed files will be created and downloaded on the first run.

**8. Sonia Schuler, Kelsey Blum, Kelly Bradley, Hannah Crespy, Kelly Daudert, Dena Elansari, Colleen Kilcoyne, Angela Zaccone and Deanne Zotter**
**Department of Psychology**

**Taking a Break From Social Media: Gender Differences and Impact on College Students' Body Image and Well-Being**

This ongoing study aims to investigate the effects of social media on college students, particularly regarding body image, eating disordered behaviors, self-esteem, and general well-being, by examining changes in these areas when participants take a one-week break from social media. We are expecting to see beneficial effects from taking a break from social media. This study is important given the frequent and consistent use of social media among college students, and our limited knowledge on the effects of this use.

**9. Michael Quin, Blaire Cain, Emily Marks, Michael Gawrysiak and Thomas Treadwell**
**Department of Psychology**

**Effects of Mindfully Practiced Yoga on Mindfulness, Self-Criticism and Depressed Mood**

Yoga is a becoming more accepted and practiced in America and research is beginning to demonstrate positive effects of this practice on the body, brain, and personality. While this practice is thousands of years old, empirical research on the effects yoga is only recently emerging. The present study examines the effects of one yoga session on mindfulness, self-criticism, and depressed mood. Study hypotheses were that a single 50-minute yoga session would significantly improve mindfulness, depressed mood, and self-criticism, compared to a non-yoga control group. Survey items included the Mindful Attention Awareness Scale (MAAS), the Abbreviated Profile of Mood States—Revised (Abbreviated POMS-R) depression sub-scale, and the Forms of Self-Criticizing/Self-Attacking & Self-Reassuring Scale (FSCRS). These measures were administered to college student participants, randomly assigned to conditions (yoga, control) immediately prior to and following the completion of their condition. Results indicated significant pre-post reductions in depressed mood for both conditions (Control: Pre-$M$=4.23, $SD$=5.71; Post-$M$=3.31; $SD$= 4.92); $t$=2.528; $p$=.015) with the Yoga condition evidencing greater reductions (Pre-$M$=1.69, $SD$=2.14; Post-$M$=.42, $SD$=.97); $t$=3.997; $p$<.001). The yoga condition also evidenced significant pre-post change in FSCRS-Inadequate Self-Criticism scores (Pre-$M$=16.90, $SD$=6.85; Post-$M$=13.22, $SD$=7.96) $t$=5.206; $p$<001). Preliminary results of this study indicate that while both groups reported lower depressed mood after some type of exercise, changes in the yoga condition were more significant than the control group. Additionally, the experimental group reported significant decrease in scores of the inadequate self-criticism FSCRS items (i.e., less feelings of self-inadequacy following a single yoga session).

**10. Abigail Downs, Allison Kolpas, Barbara Block and Frank Fish**
**Department of Biology**

**Turning Performance by Bluefin Tuna: Novel Mechanism for Rapid Maneuvers with a Rigid Body**
Tunas are considered to be energetic swimmers that are capable of exceptional migrations across ocean basins. Their aquatic performance is due to the thunniform, lift-based propulsion, stiff fusiform body shape, and large muscle mass. Rigid bodies present a limitation to the turning performance of aquatic organisms. To examine turning capabilities in a captive setting, Pacific bluefin tuna (Thunnus orientalis) were video recorded from a dorsal view as the tuna routinely swam around a large tank or when being fed. Three different types of turning behaviors were observed. Tuna would glide through the turn using the caudal fin as a rudder. Tuna would continually power through the turn using symmetrical strokes of the caudal fin. Lastly, the tuna used a ratchet turn where the global turn was accomplished by a sequence of rapid, short turns by asymmetrical strokes of the tail. Each short turn rotated the tuna about its center of mass changing the trajectory of the rigid-bodied tuna to collectively turn the fish. The angular velocity of the ratcheting action was over 2.7 times that of the global turn. This previously undescribed maneuver provides a mechanism to turn rigid-bodied aquatic organisms and underwater vehicles.

**11. Jacob Eleuteri and Susan Gans**
**Department of Psychology**

**The Nature and Context of Social Buffering in Emerging Adulthood**
Social buffering occurs when "the presence of a social partner (actual or symbolic) alters responses to a potential threat or, when experienced after a threat, helps speed the return to baseline stress levels without altering the objective nature of the threat" (Gunnar, 2017 p. 356). In recent years, we have seen evidence suggesting that family members can provide stress buffering for one another but primarily for younger children. Recently, however, we have found family members to buffer stress responses among emerging adults making the transition to college (Gans & Johnson, 2016). In the present study, we follow-up on these findings to better understand whether social buffering observed during our laboratory procedure is specific to family members or whether any social partner may be able to provide stress buffering. By comparing cortisol response to a challenge task among family triads, peer triads, and individuals in isolation (alone), we test the following hypotheses: (1) we will see evidence of social buffering in triads, but not in the alone condition and (2) family relatedness will explain changes in cortisol response. The present study follows 200 participants (ages 17-19 years) making the transition to college assigned to one of 3 conditions: family, peer, individual. Family Relatedness was assessed by questionnaire (Family Environment Scale) and saliva samples for cortisol immunoassay were collected at 20-minute intervals surrounding an interaction task (baseline, pre-challenge, post-challenge, recovery). Findings suggest that peer triads buffer cortisol responses to the interaction task and that family triads provide buffering of overall cortisol levels.

**12. Caroline Guzi, Mallory Garnett, Kenia Valdez, Keriann Mosley, Fatima Bakayoko and Eleanor Brown**
**Department of Psychology**

**Daily Poverty-Related Stress Predicts Change in Emotion Regulation for Children Attending Head Start Preschool**
The present study examined contextual poverty risks in relation to child emotion dysregulation and investigated whether an index of daily poverty-related stressors predicted change across a year of Head Start preschool attendance. Within the ecology of poverty, neighborhood adversity and single parent status may increase the likelihood of daily stressors such as overload at home, transportation difficulties, and arguments with neighbors or family members (Attar, Guerra, & Tolan, 1994). These stressors may disrupt the predictability of the proximal processes via which young children interact with their immediate environment, engendering emotion regulation difficulties. The present study included 144 children who attended Head Start preschool as well as their primary caregivers. In the fall, the primary caregivers provided information about demographic variables and also completed Bolger and Schilling's 1991 checklist of daily poverty-related stressors via phone on ten different days, with ratings averaged. Teachers rated child emotion regulation in the fall and spring using the Emotion Regulation Checklist (Shields & Cicchetti, 1997). A hierarchical linear regression analysis indicated that daily poverty-related stressors predicted variance in child emotion dysregulation beyond that accounted for by neighborhood adversity, single parent status, and maternal negative emotionality. Implications concern accounting for links between poverty and child emotion dysregulation,

understanding the impact of daily poverty-related stressors, and considering how contextual risks may limit the effectiveness of interventions focusing on child and maternal sources of child emotion regulation difficulties.

**13. Amanda Johnston and Rebecca Chancellor**
**Department of Psychology**

**Cortisol Response to Positive Reinforcement Training in Chimpanzees**

Positive reinforcement training (PRT) is a method commonly used by animal caretakes to decrease stress in captive animal associated with routine medical and maintenance procedures. While PRT has been shown to decrease displays of stereotyped behaviors and cortisol concentrations, aspects of the training such as interaction with humans and disruption of natural behaviors can be a cause of stress. Cortisol is a simple way to measure the physiological response to a stressor. Salivary cortisol reflects the short-term response to an acute stressor. To determine if PRT sessions would cause a change in cortisol concentration, saliva samples were collected before and after training sessions from 11 chimpanzees at the Maryland Zoo in Baltimore. Cortisol concentration was determined by enzyme-linked immunosorbent assay, and differences in concentration were calculated by subtracting the cortisol level before training from the level after. Results of a Wilcoxon signed-rank test showed no significant difference between the mean difference for each chimpanzee and zero, suggesting that PRT sessions have no effect on cortisol concentration.

**14. Rebecca Laconi, Daniel Loomis and Michael Gawrysiak**
**Department of Psychology**

**Stigma Against Mental Illness: Its Effects And How It Relates To Mindfulness**

Stigma is a prevalent issue for marginalized groups who are labeled as different, unwelcome or undesirable. Stigma toward the mentally ill has mostly studied attitudes and stereotypical knowledge. Stigma's behavioral effect have been less studied. Emerging research suggests that demographic variables may associate with differences in reported stigma attitudes toward individuals struggling with mental health issues. However, additional research is needed to identify what demographic and psychological variables associate with stigmatization toward mentally ill individuals. Trait mindfulness may play a prominent role in stigma attitudes as it is characterized as present-oriented awareness coupled with an accepting and nonjudgmental attitude. This study examined self-reported stigma towards individuals with mental health problems (RIBS), trait mindfulness (FFMQ) and demographic measures among college students to assess past and intended discriminatory, stigmatizing attitudes and behaviors toward the mentally ill. The study hypotheses were that (1) sub-facets of trait mindfulness would associate with reduced self-reported discriminatory attitudes and behaviors towards people with mental illness; and that (2) race, age, sex would not associate with differences in stigma. Findings were partially supportive of study hypotheses with mindful nonjudgment negatively associated with stigma towards mentally ill. The finding that the mindful observe scale positively associated with stigma was unexpected and deserves further consideration. Expanded discussion will focus on (1) interrelations between mindfulness, race, and stigma; (2) identifying factors associated with higher and lower stigmatization towards mentally ill individuals; and (3) the potential of developing mindfulness-based interventions aimed at reducing discriminatory behaviors and attitudes toward mental illness.

**15. Ariel Leahy and Frank Fish**
**Department of Biology**

**We Have Lift Off! The Role of Sea Lion (*Zalophus californianus*) Hind Flippers as Biological Delta Wings**

Sea lions are a highly maneuverable species of marine mammal. During uninterrupted, rectilinear swimming, they use their pectoral flippers to propel themselves with no aid from the hind flippers, which passively trail behind. However, sea lions utilize the delta-shape of their hind flippers during turning and leaping behaviors. Delta-wings are characterized by a strong triangular delta shape and the ability to maintain lift at very high angles of attack and delay stall. The value of delta wings have been demonstrated and utilized not only in the field of aerodynamics, but also in biology. This is evident by the convergent evolution of delta shaped control surfaces throughout the animal kingdom. Lift properties in biological delta wings differ from those of true delta wings due to the presence of a body and limbs attached to the delta surface, but the benefits are still evident. For example, in the air, a bird's delta-shaped tail stabilizes flight, reduces body drag, produces lift, and aids in maneuvering behaviors. While, in aquatic environments, this shape allows animals to produce large propulsive forces in a variety of swimming styles and behaviors. To evaluate if sea lions hind flippers function as true biological delta-wings, videos of sea lions performing bank turns and porpoising were analyzed for hind flipper angle of attack, velocities, and leaping measures. The angle of attack

can be used to estimate lift force generated by the hind flippers, which can provide insight into the benefits of delta-shaped flippers in turning performance.

**16. Colin Mancini, Erin Walsh, Ali Donohue, Ashley Nielsen, Adam Vanluvanee and Janet Chang**
**Department of Psychology**

**Social Class-Based Norms and Social Support among First-Generation College Students**
Cultural influences on social support among diverse first-generation college students have been understudied. We conducted 50 interviews (32% Racial/Ethnic Minorities, 68% Whites) to examine how culture, including social class-based norms, influences the salience of relational concerns and utilization of social support. We uncovered major relational concerns, such as concerns about burdening others and inviting judgment, which were more heightened among minority students. These issues relate directly to preferences for self-reliance, which appear related to different forms of social class and cultural norms, namely emphases on survival and collectivism. Examining these differences in cultural patterns reveals the need for interventions that frame college and student support structures in ways that are compatible with first-generation college students and their cultures.

**17. Brooke Miller, Vanessa Johnson and Susan Gans**
**Department of Psychology**

**Sleep Onset Latency During the Transition to College**
The transition to college is a momentous time for emerging adults (EA). For some, the obstacles faced when making the transition to college exceed their coping resources and lead to significant social, emotional, and academic distress (see Leong, Bonz, and Zachar, 1997). Sleep disturbance is one of the ways that stress manifests during times of transition. Sleep disturbance puts individuals at risk for a variety of physical and mental health problems (Milojevich & Lukowski, 2016; Okun, 2011). Sleep onset latency (SOL), or the amount of time that it takes an individual to fall asleep and reach the second stage of sleep, is a specific type of sleep disturbance affecting between 35-40% of the population (Hossain, & Shapiro, 2002). While SOL is a common problem, we know relatively little about it. The purpose of the current study is to better understand the correlates of SOL during the transition to college. We hypothesize that positive college adjustment and greater family and social support will be associated with shorter SOL. Emerging adults' family environment may be a source of support during the transition to college. A cohesive family facilitates adaptive functioning (Minuchin, 1974), providing the emerging adult with a "secure base" while managing her new college environment (Johnson, Gans, Kerr, & Deegan, 2008). Based on findings suggesting that the quality of family functioning moderates the relationship between stress and college adjustment (Gans & Johnson, 2016), we also test the hypothesis that family functioning moderates the relationship between SOL and EA adjustment to college.

**18. Jason Miller and Jessica Schedlbauer**
**Department of Biology**

**The influence of edge effects on soil respiration and soil carbon storage in temperate deciduous forests of southeastern Pennsylvania**
The development of edge effects can influence ecosystem processes such as soil carbon cycling and storage through the alteration of microclimate. However, few studies have quantified how these processes change at temperate deciduous forest edges, despite the prevalence of fragmented forests. The aim of this study was to investigate the impact of edge effects on soil carbon cycling and storage in Eastern deciduous forests during the 2018 growing season. At each of three study sites, three 100 m transects were established with plots at 5, 15, 30, 60 and 100 m from the forest edge. Monthly measurements of soil respiration, soil temperature, and gravimetric soil moisture were made in each plot. Litter biomass and soil carbon content were measured once in each plot. Decomposition rates were also assessed in each plot via a litterbag study. Soil respiration rate and soil temperature significantly differed along the edge to interior gradient ($p < 0.001$) and were highest in the middle of the growing season ($p < 0.0001$). Throughout the growing season, gravimetric soil moisture significantly differed along the edge to interior gradient ($p < 0.0001$). Litter biomass, soil carbon content, and decomposition rate did not differ significantly along the edge to interior gradient ($p > 0.05$). Edge effects are altering microclimatic conditions in fragmented forest ecosystems, leading to greater soil respiration rates at the edge. As a result, a greater release of carbon dioxide is likely in fragmented forest ecosystems relative to contiguous forest, creating a positive feedback to climate change.

**19. Sarah Polohovich and Jessica Schedlbauer**
**Department of Biology**

**Changes in carbon distribution, structure, and composition in an isolated forest fragment: implications for future management**

Pressures from white-tailed deer browsing, non-native species, forest fragmentation, and changing climate threaten carbon storage capacity and community composition of many Eastern deciduous forests. Aging forests can shift from carbon sink to source as older trees die, creating a positive feedback to climate change. The potential for these negative consequences was explored in the Gordon Natural Area, an Eastern deciduous forest in southeastern Pennsylvania. Study objectives were to quantify changes in three major carbon pools, aboveground biomass (AGBM), belowground biomass (BGBM), and coarse woody debris (CWD), as well as determine structural and compositional changes over a five-year period. Nine 0.2 ha plots were censused in 2013 and 2018 to determine species and quantify the parameters above. Total AGBM, BGBM, and CWD all increased significantly from 2013 to 2018 ($p < 0.05$). Additionally, total carbon storage increased significantly over the five-year period (206 ± 13 to 234 ± 12 Mg C ha-1). When broken into stem diameter size classes, AGBM increased significantly in large diameter trees (60 + cm, $p < 0.01$). The understory was mainly comprised of Norway maple (Acer platanoides) and American beech (Fagus grandifolia), while the canopy was dominated by tulip poplar (Liriodendron tulipifera) and oak species (Quercus sp.). As large trees die, an increased release of CO2 to the atmosphere is likely, thereby amplifying the effects of climate change. Additionally, the understory tree species that replace aging canopy trees will result in a future forest that is more homogenous, with abundant non-natives, thereby jeopardizing forest ecosystem services.

**20. Genevieve Pomeroy and Gregory Turner**
**Department of Biology**

**Differential Effects of Native and Invasive Allelopathic Shrubs on Plant Germination and Growth**

Invasive plant species are one of the most prominent threats to Eastern deciduous forests. One such species, *Lonicera maackii*, is a shrub that exhibits allelopathic effects in areas immediately surrounding the plant. A native plant, *Lindera benzoin*, similarly employs this competitive inhibition mechanism. Few studies have made comparisons between allelopathic shrubs in this ecosystem. The allelopathic effects of these plants were compared both in the field as well as in greenhouse and laboratory studies. In the field, woody and herbaceous plants were censused beneath both shrubs at three different sites, and a number of abiotic factors were quantified. In the greenhouse, germinating *Quercus stellata* were treated with high and low concentration exudates prepared from *L. benzoin* and *L. maackii*, after a period of growth the *Q. stellata* specimens were then processed and secondary growth variables were characterized. A germination study was then conducted on *Ulmus americana* seeds using the same exudates and concentrations from the greenhouse study. Analysis of field, greenhouse, and laboratory data determined that exudates from *L. maackii* and *L. benzoin* have differing effects on native woody plants.

**21. Priyatharsini Selvarathinam, Joelle Skacel and Vipanchi Mishra**
**Department of Psychology**

**Investigating the Effects of Mindfulness Meditation on Selection Test Performance**

Purpose: Mindfulness is defined as the practice of paying attention to the present moment in a deliberate and non-judgmental manner (Kabat-Zinn, 2003). The purpose of the current study was to investigate the effects of mindfulness on selection test performance. Further, the study investigated the mediating role of interview anxiety on the relationship between mindfulness meditation and overall interview performance.

Method: Participants (N=38) included those who were employed for at least 10 hours per week and were students of West Chester University. They were randomly divided into mindfulness and control conditions. Each participant was prepped to assume the role of an applicant for a customer service position. Based on the condition, participants either listened to a 30-minute mindfulness meditation audiobook or a nutrition audiobook for five consecutive days. Participants also answered interview questions and completed cognitive ability test, situational judgement test, and measures of anxiety on the first and last day of the study.

Outcome: Results indicate that mindfulness meditation significantly improved overall interview performance. However, no significant differences in performance were observed for situational judgment test or the cognitive ability test across the two conditions. One important finding of this study was that mindfulness meditation seemed to increase interview performance by lowering interview anxiety. An implication is that recruiters and coaches could use

mindfulness mediation as a tool to improve interview performance for candidates. Also, organizations can provide mindfulness training to leaders who frequently meet with stakeholders and investors as it could reduce anxiety levels and improve their performance.

**22. Cassidy Tennity and Stevie Grassetti**
**Department of Psychology**

**Do group characteristics predict an individual's change in group treatment for PTSD?**

Youth who have experienced trauma may have difficulties with peer relationships. These difficulties can present challenges for group interventions as they may detract from therapists' ability to adequately cover session content. This study as designed to assess whether the level of problems with peer relations within a group predicted members' ability to benefit from treatment. We hypothesized that group peer relation difficulties would negatively predict therapeutic benefit.

Participants were 17 youth in grades KN-5 within five therapy groups. At baseline, teachers reported on youth's prosociality using the Strengths and Difficulties Questionnaire (alpha=.69) Youth completed the UCLA-r Reaction Index to assess PTS symptoms at baseline and following treatment. A pre-post change score was used as an index of therapeutic benefit.

Due to the nested structure of the data (children within groups), we used Hierarchical Linear Modeling (HLM) to evaluate whether group characteristics accounted for variance in PTS symptoms. An unconditional two-level model yielded an intraclass correlation (ICC=.33), which suggested group-level differences accounted for only a small percent of variance in outcomes. Accordingly, we calculated follow up analyses to determine whether individual levels of peer problems were related to change during treatment. A Pearson's bivariate correlation showed that baseline peer problems were not related to change in PTS symptoms ($r$=.13, n.s.). Results of the unconditional model suggest that individual-level variables predict more variance in therapeutic benefit than do group-level variables. The correlation suggests that individual peer relation problems are not a significant predictor of therapeutic benefit. Limitations and future directions are discussed.

# Undergraduate Student Posters

**23. Emily Feldman, Cassidy Tennity and Stevie Grassetti**
**Department of Psychology**

**Cross-Informant Consistency of Externalizing and Internalizing Problems in School-Aged Youth**

Using multiple informants to assess psychological difficulties can provide clinicians with valuable data demonstrating the impact and frequency of behaviors across contexts[1]. Still, reports from multiple informants can be time consuming and costly, so it is important to determine whether multiple informants are providing unique or redundant information. Both internalizing (e.g., anxiety, depression) and externalizing (e.g. rule breaking, aggression) problems may impact students' learning at school and more information about how to best assess these problems can help ensure that students with these difficulties are appropriately identified. In this study, we examined three informants (parents, teachers, self) rating of children's internalizing and externalizing behaviors to determine whether they rated these behaviors consistently. Participants were 63 school-aged youth in grades KN-5. The Brief Problem Checklist (BPC) was completed by parents, teachers, and children to assess externalizing and internalizing behaviors[4]. As hypothesized, there was a positive correlation between child/teacher ($r$=.359, $p$=.01) and parent/teacher ($r$=.345, $p$=.01) ratings of externalizing behaviors. There were no significant correlations between reporter ratings of internalizing behaviors. This could be due to the difficult nature of recognizing internalizing behaviors unless expressed by the child. These results suggest consistency between parents' and children's and, teachers' and children's reports of externalizing behaviors, but inconsistency between parents', teachers, and children's reports of internalizing problems. The findings of this study could help to make screening more efficient by prioritizing multiple sources of data collection for internalizing problems while reducing the need for children as reporters of externalizing problems.

Table 1

*Pearson's Product Moment Correlations Among Informant Reports of Externalizing Scores*

| Variable | *M* | *SD* | 1 | 2 | 3 |
|---|---|---|---|---|---|
| 1. Self-Report | 3.02 | 2.75 | 1 | | |
| 2. Parent Report | 2.00 | 2.31 | .19 | 1 | |
| 3. Teacher Report | 1.85 | 3.19 | .36** | .35** | 1 |

*p<.05
**p<.01

Table 2

*Pearson's Product Moment Correlations Among Informant Reports of Internalizing Scores*

| Variable | *M* | *SD* | 1 | 2 | 3 |
|---|---|---|---|---|---|
| 1. Self-Report | 3.95 | 2.72 | 1 | | |
| 2. Parent Report | 2.21 | 2.43 | -.09 | 1 | |
| 3. Teacher Report | 1.98 | 2.21 | .06 | .16 | 1 |

*p<.05
**p<.01

**24. Syria Aaron and Jacqueline Zalewski**
**Department of Anthropology & Sociology**

**Protect Our Girls: Sex Trafficking Happening in Philadelphia's Backyard**

Over the years, the sex trafficking industry in the United States has evolved. In the past when the term was used, it associated with foreigners in massage parlors or brothels. Recently, traffickers have new pathways to abduct, force, and coerce women and children into being sexually exploited. This is the point with sex trafficking: young women and children are coerced and forced into the trade. I know this from witnessing sex trafficked victims and sex workers through time spent volunteering in a Philadelphia neighborhood in close proximity to my home.

My poster describes my research for an independent study and senior capstone courses in sociology in 2018. To better understand the sociology of sex trafficking, I reviewed the following five analytical areas in the field: 1. distinguishing between sex trafficking victims and sex workers, 2. pathways into sex trafficking; 3. the experience of sex trafficking; 4. efforts to reduce it; and 5. sex trafficking and health. Using participant observation at a Philadelphia resource center serving victims, my poster reflects on these scholarly gaps and it shows the pathways and experience of sex trafficking happening in Philadelphia's backyard. It will also discuss the resources available for victims, their limitations, and I suggest remedies that will better serve and reduce the number of victims effected by sex trafficking.

**25. Aaima Amer and Teresa Donze-Reiner**
**Department of Biology**

**Relationship of age and depressive symptoms with diabetes management variables in older African Americans**

When diabetes mellitus is poorly managed, resulting complications often lead to presentation in the emergency department. Furthermore, there is an increased incidence of diabetes in the African American population in comparison to its white counterpart. The Diabetes Interprofessional Team Adherence to Medical Care (DM I-TEAM) Study evaluates the effectiveness of an interventional, team-based approach to help reduce the emergency visits of older African Americans due to complications of their diabetes. Participants of the study were enrolled after being screened for eligibility criteria during their visit to the Emergency Department of Thomas Jefferson University Hospital for a diabetes-related chief complaint. Among the baseline data, variables such as Hemoglobin A1c blood test levels, ratings of self-efficacy, ratings of engagement in diabetes management behaviors, and scores of self-reported medication adherence are used to determine how well a patient manages their diabetes. When the variables were compared against age, there is a significant correlation between age and both lower HbA1c levels and higher medication adherence scores, indicating older patients can better manage their diabetes. Additionally, patients exhibiting more severe depressive symptoms are not able to manage their diabetes as effectively, as indicated by the relationships between depressive symptoms with self-efficacy scores and self-reported medication adherence. The findings of this analysis could be attributed to factors such as the longevity of effective diabetes management or the availability of federal funding for medications of older patients.

**26. Maggie Anabui, Zane Christmyer and Mahrukh Azam**
**Department of Chemistry**

**Interaction of a Cationic Porphyrin with G Quadruplex DNA in Different Salt Conditions**

G-quadruplex (GQ) structures arise from guanine-rich DNA sequences found at telomeres, at the promoter regions of oncogenes and at the 5' end of untranslated mRNA in the human genome. The GQ structures are implicated to have a role in aging and cancer. Here, we studied the interaction of the cationic porphyrin 5, 10, 15, 20-Tetrakis (N-methyl-4-pyridyl)-porphyrin (TMPyP4) with tetramolecular GQ structures formed from dT4G4 and dT4G4T. This was done under low versus high salt conditions (100mM KCl/ NaCl or 800mM KCl/NaCl) in 10mMKPi or NaPi buffer, pH 7.0. Circular Dichroism, Fluorescence emission, and UV-Vis absorption spectroscopy were used to study these interactions. The results showed an increase in the fluorescence intensities with high salt buffer, for both K+ and Na+, compared to low salt buffer. In low potassium buffer, the fluorescence intensity was slightly higher in (dT4G4)4 compared to (dT4G4T)4, but in all other buffer solutions there was no difference in intensity between the two DNA sequences. Consistent with the previous studies, binding of porphyrin with GQ DNA resulted in red shift and hypochromicity under all conditions indicative of porphyrin-DNA complex formation. Overall, this work contributes to a better understanding of the interactions between porphyrin and GQ DNA under different salt conditions.

**27. Christopher Catranis and Pisciotta John**
**Department of Biology**

**Exploring the Impact of Mycofiltration on T4 Coliphage Concentration**

Mycofiltration involves the use of fungi to treat fluids, such as wastewaters, using a mycelial biofilter. This technology can be useful in developing countries in dire need of clean water. Various microbes transmitted via water are pathogenic. Low cost systems capable of disinfecting waste waters of microbial contaminants are needed. Many different systems have been developed to provide clean water. Water treatment plants often use sand, and the affordability of this technology has made it an option for developing countries. The current experiment involved the testing of sand and mycofilters in conjunction. The goal was to develop a system that remediates runoff water of virus, using basidiomycetes in sand. Two species of fungi were cultivated (49 days, 25° C). Their mycelium (0.5 grams) was grown on woodchips in sand. The two mushroom species used were Oyster mushroom (*Pleurotus ostreatus)* and Garden Giant (*Stropharia rugosoannulata*). 50 ml of a T4-Coliphage virus sample titre of 1.07x10^7 pfu/ml was delivered to determine if either fungi enhanced sand filtration of virus as determined by effluent plaque assay. T4-Coliphage concentration was measured before and after filtration. Results: 62% reduction by Oyster, 45% by Stropharia compared to 76% reduction by sand filter indicate no significant difference between using a mycofilter in conjunction with a sand filter versus a simple sand filter on the concentration T4-coliphage in filtered water.

**28. Ella Choban and Timothy Starn**
**Department of Chemistry**

**Evidence of electrical charge on gunshot residue during the firing of a weapon**

A long-used composition of ammunition primer has been a mixture of lead styphnate, barium nitrate, and antimony (III) sulfide which, upon detonation, lead to the formation of inorganic gunshot residue (GSR). The metals are all cations in their pre-detonation form and undergo reduction reactions during firing to form the classic spheroidal, micron-sized particles indicative of gunshot residue. However, the rapidly changing pressure and temperature of the reaction zone almost surely guarantees that the reactions cannot go to completion. In this study, we will show evidence that firing a weapon produces an electrical discharge which corroborates the redox chemistry. We will also suggest evidence that the GSR is not electrically neutral during its formation, and its production is akin to the process of droplet formation in an electrospray ionization source. Lastly, we will comment on the influence these findings could have on interpretation of GSR in a crime scene.

**29. Katherine Coyle and James Pruitt**
**Department of Chemistry**

**Optimization of the Production of rhMIF from Plasmid in E. Coli**

This experiment optimized the expression and isolation of recombinant human MIF protein from transformed E. coli. MIF is a cytokine involved in the innate immune system; therefore, it can lead to autoimmune inflammatory responses when not regulated correctly by the immune system. The strain of E. coli that had been transformed with a recombinant expression vector included ampicillin resistance and was used to produce human MIF with a poly-histidine tag on the N-terminus. Multiple growth conditions of LB and Terrific broth, inoculated with ampicillin, were compared in their effectiveness of E. coli growth and survival. Various orbital incubation RPM values, growth temperatures ranging from 25-40°C, and cell lysate methods were tested to determine the appropriate method for the maximum yield of protein produced. A method consisting of a growth temperature being 37°C, an RPM of 96-100, and cell lysate technique of sonication was successful in maximizing and releasing the protein within the cytoplasm. The amount of protein within the supernatant was analyzed by observing the band on an SDS-PAGE gel stained (GelCode Blue) specifically for the poly-His tag. Once the protein yield was maximized, a purification process was performed using Immobilized Metal Affinity Chromatography columns. The supernatant was run through a HisPur™ Ni-NTA Resin column to purify the MIF. After isolation and purification, the protein was further denatured and dialyzed to be refolded to its natural human confirmation.

**30. Duncan Espenshade and Jenna Becker Kane**
**Department of Political Science**

**The Effect of Democracy on Quality of Life Over Time**

The world is drifting away from democratic governance. Political parties around the globe are eroding democratic institutions with extreme populist politics, whether it be the BJP in India, the Five Star Movement in Italy, PSL in Brazil, or SYRIZA in Greece. The so called "end of history" political theory, which predicted that the end of the Cold War would result in a global acceptance of democracy, is being brought into question. Considering these trends, political scientists need to determine if modern democracy can still provide a better quality of life (QOL) when compared to other systems of governance. To do this the effect democracy has on QOL over time needs to be determined. Literature on the topic suggests three potential relationships between democracy and QOL over time. The first of which is purely linear, where QOL will rise as democracy rises. The second is that democracy will initially foster QOL but will eventually stifle it over time. The last potential relationship is that democracy will not immediately foster QOL but will do so over time. To test these relationships democracy rates were compared to quality of life over 185 countries within a 27-year time-frame, with Polity IV rates representing democracy and the Human Development Index representing quality of life.

**31. Kara Evans and Eric Sweet**
**Department of Biology**

**Use of variable emission rare earth LEDs (VERE-LEDs) in optogenetic stimulation of neuronal tissue**

Optogenetics is a method that uses light to modulate molecular events through light-gated ion channels called channelrhodopsins. The use of this technology has been widely used in electrophysiological studies to address the functions of specific cell types. While most electrophysiological research to date is based on the stimulation of cells in a general region of tissue, it fails to address the functional differences between the cells in these areas. In order to activate specific cell types in the same region, you need a source that emits a narrow wavelength of light and produces a low amount of heat. Lasers can emit light with a narrow wavelength but produces a high amount of heat. Common LEDs produce a low amount of heat but emit light within a wide range of wavelengths. When two different color rhodopsins are used, there is overlap between the two emission spectra. Variable emission rare earth LEDs, or VERE-LEDs, offer a potential solution to these limitations because they are capable of emitting light on the range of one nanometer while also maintaining a low amount of heat production. Due to the fact that most brain regions are heterogeneous, the use of two-color stimulation offers a way to differentiate between different cell types and their respective functions. VERE-LEDs are also capable of emitting two different colors simultaneously from the same LED. To compare these LEDs with the standard LEDs, the light intensities must be calibrated to ensure that the stimulation is enough to activate the channelrhodopsins located in the neuronal tissue. If these LEDs prove to be better than the current manufactured LEDs, they could potentially be implemented into physiology research and treatments for a wide variety of neurodegenerative diseases.

**32. Alyssa Harvey and Erin Hill**
**Department of Psychology**

**Examining an Intervention to Promote Appropriate Antibiotic Use Self-Efficacy**

The purpose of this presentation is to describe research from the Hill Health Psychology Lab focused on appropriate antibiotic use self-efficacy (AAUSE). The research team has conducted two studies on this topic; one that developed the appropriate antibiotic use self-efficacy scale (AAUSES), and the present study, which examines an intervention to promote AAUSE.

According to the Center for Disease Control (CDC), antibiotic resistance occurs when bacteria are no longer killed by the drugs developed to eliminate them. In American alone, the CDC (2013) estimates that each year 2 million people are infected with antibiotic resistant bacteria, and of those, 23,000 will die as a result. An important topic that has not been closely examined is patient self-efficacy as it relates to appropriate antibiotic use. Once the prescription leaves the doctor's office, the responsibility ultimately rests with the patient to adhere to instructions and decision-making surrounding the medication.

In 2018, a scale to measure appropriate antibiotic use self-efficacy (AAUSES) was developed and its psychometric properties were assessed (Hill & Watkins, 2018). The scale measures three factors: minimization of antibiotics and trust in physician recommendations, avoidance of antibiotics for viral infections, and avoidance of taking old/others' antibiotics. The current study aims to examine whether AAUSE can be improved through a psycho-educational

intervention. The social cognitive model was used to develop the intervention, and data collection for the present study has been taking place during the Spring 2019 semester. Hypothesized results for the current study and implications will be discussed.

**33. Rachel Hibbert and Eric Sweet**
**Department of Biology**

**Establishment of Cre-Loxp Red and Blue Rhodopsin Mouse Lines for use in Optogenetic Studies**

Optogenetics is an emerging field in the use of studying disease pathologies in a variety of model systems. As such, the demand for transgenic mice model systems have increased significantly. Each assay performed necessitates a unique system that can accommodate the needs of the researchers involved. Our lab is collaborating with Dr. Brandon Mitchell of West Chester University's physics department to test a new system of vere LED lights that may provide better sample specificity as well as produce less heat. To do this, a new transgenic line of mice needed to be generated and maintained. In order to get neuronal tissue specificity in our mouse lines we have used the Cre-Loxp system. Such a system relies on Loxp, two 34 bp recognition sites, and Cre, a cleaving enzyme that recognizes Loxp. This system allows for tissue specificity as well as the expression of specific genes. For our lab, we will be using the Cre-Loxp system to express blue and red rhodopsin expressing genes. As such, the main aims of this experiment are to establish and maintain two lines of pure Loxp-rhodopsin mouse lines (one blue and one red), one line of the Loxp-Cre blue rhodopsin mouse lines, one line of the Loxp-Cre red rhodopsin mouse lines, and another line of noncarrier mice. These mice will then be used by Dr. Mitchell to test his optogenetic vere LED lights. We hope that the establishment of these lines will provide a new model system for future optogenetic studies of neuronal tissue.

**34. Jared Kline and Greg Turner**
**Department of Biology**

**Density, Size and Health Status of *Juglans nigra* at the Gordon Natural Area**

*Juglans nigra* (Eastern Black Walnut) is an early successional, riparian, species that prefers deep well drained soils. While the species is not yet considered to be threatened in Pennsylvania, there are many pests and pathogens that affect its population in the state. Pathogens such as thousand cankers disease (*Geosmithia morbida*) and bootstrap fungus (*Armillaria mellea*) are known to damage and kill *J. nigra* in its range beyond the state and are especially of concern as they may arrive here. Thus, this study sought to provide a baseline survey of the population and health status of the species at the local Gordon Natural Area on WCU's South Campus. Density, tree size and crown health where assessed for each J. nigra tree encountered across three forest habitats at the preserve; riparian, floodplain and lowland. These habitats were classed based on proximity to Plum Run, a stream traversing the Gordon, with riparian being closest and lowland farthest with distance. Results were analyzed and found that density was greater in the lowland compared to the other habitats, while mean tree size and overall crown health did not differ between habitats. Overall, these results provide valuable baseline data to assist forest management at the Gordon and similar forests containing *J. nigra* throughout the region and state.

**35. Emily Marks and Michael Gawrysiak**
**Department of Psychology**

**Mindfulness and Marijuana Use Motives Among College Students**

Marijuana is the most common illicit drug used by college students, and reports indicate that use is increasing. College student marijuana use is associated with numerous negative consequences including cognitive decline, mental health problems, and poorer academic performance. Mindfulness (present-oriented nonjudgmental attention) is a construct relevant to marijuana use and treatment. However, little research has examined the role that trait-mindfulness plays in marijuana use motives or marijuana use severity among students. The present study examined associations between marijuana use severity, motives for marijuana use and trait mindfulness among college students ($N$=180). Survey items included the Marijuana Motives Measure (MMM); the Marijuana Dependence Checklist (MDC); and the Five Facet Mindfulness Questionnaire (FFMQ). Study hypotheses were that trait-mindfulness would inversely associate with marijuana use severity and marijuana motivation subscales; and that trait-mindfulness would predict marijuana use symptom severity and frequency of use during the prior 30 days. Results indicated that trait-mindfulness inversely associated with number of CUD symptoms endorsed ($r$=-.152, $p$=.041), and the 'coping' ($r$=-.235, $p$=.002) and 'conformity' ($r$=-.179, $p$=.061) marijuana motives subscales. Trait-mindfulness sub-facets 'acting with awareness', 'describe', and 'nonjudgment' predicted CUD symptoms ($p$<.05). The marijuana use motive subscales 'coping',

'social', and 'enhancement' were more predictive of marijuana use severity and frequency of use in the past 30-days ($p$<.001). Mindfulness demonstrated significant and inverse associations with CUD symptom endorsement and coping and conformity motives for marijuana use. Expanded discussion will focus on mindfulness sub-facets and marijuana use coping motives as well as implications of CUD treatment modification for college students.

**36. Christopher McAllister, Jonathan Barron and Jessica Sullivan-Brown**
**Department of Biology**

**Role of *dcaf13* in *C. elegans* Development and the MYC Pathway**

Understanding the molecular pathways and the regulatory factors involved in cancer progression is a critical step in the battle to detect cancer before it reaches an advanced state, and improve patient survivability. MYC is an oncogene that has been found to be highly upregulated in many human cancers and has such been the focus of research over the past few decades since its discovery in 1979. Recently, a study has revealed a strong correlation between the amplification of a lesser known protein-coding gene *dcaf13*, and upregulation of MYC in patients suffering from hepatocellular carcinoma. Additionally, both MYC and *dcaf13* are found on chromosome 8 in a region notorious for being upregulated in many forms of cancer. As part of a Bio421: Cell and Molecular Biology lab project, we tested the role of *dcaf13* using RNAi knockdown in the small roundworm *Caenorhabditis elegans (C. elegans)* and measured the overall length of the worm, the ability of intestinal cells to assume their correct cell fate, and the expression of FASN and DUSP1, two MYC target genes. This study found that the endodermal development was affected when *dcaf-13* was knocked down and that there was a reduction in the overall size of the worms. There was variation in the response of the MYC target genes. While FASN was no longer expressed in *dcaf-13*(RNAi) worms, the knockdown of *dcaf13* appeared to have little or no effect on the expression of DUSP1. These findings suggest that although upregulation of MYC is associated with amplification of *dcaf13* other regulatory factors are in place to control how this amplification will effect MYC target genes downstream.

**37. Enrique Mentado Sosa and John Pisciotta**
**Department of Biology**

**Effects of the Microbiome on Withdrawal-Like Behavior in Planaria**

Here we are investigating the effects of altering the microbiome on an animal's behavior using the planaria as a model system. The specific species of Planarian worms used were *Girardia tigrina* (Brown Planaria) and *Phagocata gracilis* (Black Planaria). The hypothesis tested was that altering the microbiome of the Planaria using the broad-spectrum antibiotics Kanamycin and Ampicillin influences the worms' behavior and withdrawal response to an addictive substance, nicotine. A secondary objective of this study was to characterize the microbiome of Brown and Black planaria using conventional plating techniques and microscopy. The study focuses on analyzing the behavior of four groups of planaria and their withdrawal response in the absence of nicotine after a seven-day period of exposure to no drugs, Ampicillin alone, Kanamycin alone, and a combination of Ampicillin and Kanamycin. Behavioral analyses involved recording the motility of planaria on a one-centimeter squared grid for a period of five minutes. Four treatment groups were analyzed, each involving different exposure conditions to either nicotine or artificial pond water (APW). The results of this study will provide data to understand how the planaria microbiome affects their behavior, and thus how the microbiome of humans might influence our behavior. 16s rDNA DGGE analysis with or without antibiotics indicated that drug treatment altered the microbiome of the planaria, and thus may have an impact on the worms' behavior. Motility tests of worms treated with antibiotics alone indicated that Black planaria motility was affected but Brown planaria motility was not.

**38. Emily Mesaros and Jennifer Chandler**
**Department of Biology**

**Baseline Measurements of Woody Plant Composition, Coverage, and Diversity Surrounding Spotted Lanternfly's Host Species, Tree-of-Heaven, in the Gordon Natural Area**

In 2014, Spotted Lanternfly, a damaging invasive insect originally from China, was first detected in the U.S. in Berks County, PA. Spotted Lanternfly prefers characteristics in a host tree such as smooth bark and higher concentrations of cytotoxic compounds, which are common in Tree-of-Heaven, the presumed host tree. The specialized piercing/sucking mouthparts of Spotted Lanternfly allow them to suck sap from plant tissue, they excrete honeydew from the hindgut, and the honeydew facilitates sooty mold growth. Damage to surrounding plants may occur at least in part to a reduction in photosynthesis from the shading effect of the sooty mold. The effects of Spotted Lanternfly

infestations on native and invasive woody species throughout forests of the eastern U.S. are largely unknown. However, Pennsylvania is a large producer of grapes, apples, and hardwoods, and there is concern that the health of these and other plant species may decrease in response to Spotted Lanternfly. In an effort to further our understanding of the effects of Spotted Lanternfly, we established five-meter radius circular plots around randomly selected A. altissima trees in the Gordon Natural Area on West Chester University's campus . All woody species were identified and either DBH or DRC was measured. Cross-sectional area, mean relative density, and proportion of native versus invasive species were calculated from these data. This survey aims to develop a baseline understanding of the woody vegetation that currently surrounds A. altissima in the Gordon Natural Area so that an assessment of impacts can be made once invasion occurs.

**39. Sharon Moengo and Erin Gestl**
**Department of Biology**

**The Expression of the DNA Nucleotide Excision Repair Genes XPF,RPA, TTDA, and RFC in Zebrafish During Development and Ultraviolet Light Exposure**

DNA Nucleotide Excision Repair is a mechanism that detects and repairs DNA damage. DNA damage is caused by various chemicals and forms of radiation and may alter the makeup and structures of the DNA molecule. In this study, Zebrafish were used as a model system to evaluate the expression levels of Nucleotide Excision Repair genes (XPF, RPA, TTDA, and RFC) at different developmental stages and following different levels of ultraviolet light exposure. XPR is a catalyst which has a role in the 5-prime nick during DNA repair. RPA is a fragment of the replication protein A complex, which aides in activation of the DNA damage checkpoints by recruiting the necessary proteins. TTDA stimulates the production of the transcription factor TFIIH, which has a role in the repair mechanism. RFC stimulates the assembly of the five subunit ATPase which is necessary for the activation of DNA polymerase to synthesize double stranded DNA. The primers for the genes were diluted, and the optimal conditions were determined by a gradient PCR reaction. A cDNA synthesis was performed using RNA isolated from the zebrafish embryos at different developmental stages and from zebrafish embryos exposed to ultraviolet light. The expression levels of the genes were determined by a quantitative reverse transcriptase polymerase reaction (q-RT PCR). This research is important because it shows the effects that ultraviolet light has on the nucleotide excision mechanism.

**40. Natalia Mosquera and Erin Gestl**
**Department of Biology**

**The effects of ultraviolet light on Nucleotide Excision Repair (NER) genes CSA, CSB, XPA and XPG in Zebrafish**

Nucleotide Excision Repair (NER) is a process that helps fix alterations made to the chemical composition and structure of DNA by DNA damaging agents, such as Ultraviolet (UV) light. The enzymes involved in the DNA repair are critical for repairing and preventing mutations. In this study, Zebrafish (*Danio rerio*) was used as a model system to investigate the effects that UV light has on the following NER genes: CSA, CSB, XPA and XPG. CSA and CSB are genes involved at the beginning of the NER process and prevent the advancement of RNA polymerase on the transcribed strand with a DNA lesion. XPA encodes a zinc finger protein that acts as a scaffold to help form the NER incision complex at the lesion site. XPG is involved in the formation of the preincision complex and it serves as an endonuclease by cleaving substrates so that an incision 3' to the lesion can be made. To study the effects of these genes in the repair process, cDNAs were made using the RNA from different ages of zebrafish and RNA from embryos exposed to UV light. Furthermore, the cDNA was used in quantitative reverse transcriptase polymerase reactions (q-RT PCR) to quantify the expression levels of NER genes. Studies on NER genes help determine the effects of damaging agents. Since zebrafish have a genomic sequence with a high-level of evolutionary conservation (compared to the human genome), the findings can contribute to research on the NER process that occurs in humans.

**41. Lusine Ovsepyan and Gustav Mbuy**
**Department of Biology**

**Detection of Antiviral Activity in African Medicinal Plant**

The purpose of this experiment is to detect antiviral activity from a Congolese medicinal plant, Kampanda, against Herpes Simplex Virus 2 in Vero cells. The plant part used in this experiment was the root, which, was dried, and ground into a powder. The powder was then extracted using series of solvents starting with hexane, methanol and water through classic Soxhelet extraction. The resulting methanol extract was dried, scraped, and stored in a glass

vial. The crude extract was run on thin layer chromatography (TLC) to detect how many possible components can be isolated. Crude methanol extract exhibited the presence of alkaloids and terpenes. However, the presence of phenols was inconclusive. It was determined that Kampanda possess antiviral activity in its methanol extract. When applied to HSV 2 - infected cells, virus replication was reduced by greater than 70% at the concentration of 125ug/ml. At the time of this abstract it was not determined which of the chemical components is responsible for the antiviral activity.

**42. Joyce Pour-Azar and Jasmin Tahmaseb McConatha**
**Department of Psychology**

**The Many Faces of Ageism**

Described as "the third great 'ism' in most societies, after racism and sexism" (Palmore, 2001), ageism is the act of stereotyping or discriminating against a person/group of people based on their age. AARP (2014) has reported that 64% of workers have experienced ageism in the workplace. People are living longer and healthier lives, as such they are also staying in the workplace longer. In fact, the age group of 65-74 is projected to see the second largest labor force increase between 2017 and 2026 (Bureau of Labor Statistics, 2017). Given this increase, it is very likely that there will be an associated rise in ageism. Women, minority, and immigrant workers are at an even greater risk for experiencing multiple forms of discrimination in the workplace. Being victimized by discrimination has intersecting negative personal, social, and cultural consequences; ageism negatively influences overall well-being, feelings of self-worth, and leads to marginalization in the workplace and a decline in job engagement and job satisfaction. This presentation focuses on an analysis of qualitative interviews conducted with 23 older workers (age range 56 to 72). Findings indicated that the effects of ageism are widespread, negatively impacting the workplace, personal relationships, and physical and psychological health. This presentation focuses on an overview of the many "faces of ageism" in the workforce. Discussion will focus on ways of coping with and combating ageist treatment and the social and political factors that serve as enablers of age discrimination.

**43. Lucas Ribeiro and Eric Sweet**
**Department of Biology**

**Anti-amyloid Treatment in Asymptomatic Alzheimer's Disease (A4)**

Background

Alzheimer's disease (AD) is caused by the accumulation of amyloid-beta (Aβ) plaques and neurofibrillary tangles. Solanezumab is a humanized monoclonal antibody that will recognize and interact with Aβ increasing its clearance from the brain preventing the accumulation in the Nervous System.

Objective

To investigate if Solanezumab can slow and possibly stop the progression of memory and cognition problems related to brain amyloid in presymptomatic patients.

Design

In order to access the presymptomatic phase of the disease, participants with evidence of AD pathology through florbetapir positron emission tomography (PET) are submitted to ADCS Preclinical Alzheimer Cognitive Composite (ADCS-PACC), a series of tests that measure memory, global cognition and normal function. The study's design is to conduct a double-blind, placebo-controlled, phase 3 clinical trial in a total of 1150 patients ranging from 65 to 85 years old who are at risk of developing symptoms of AD. Infusion of the drug is randomized, and patents will receive placebo or 400-1600 mg of Solanezumab intravenously every 4 weeks for 240 weeks.

Results/Conclusion

The study is still ongoing on phase 3 Clinical trial with an estimated completion date of July 22, 2022. We look forward to gathering enough significant information if Solanezumab has efficacy in decreasing the accumulation of amyloid-beta protein in the presymptomatic population who has been administered the drug compared to the control group.

**44. Paige Ridings and Jenna Becker Kane**
**Department of Political Science**

**Electoral Proximity and Amici Influence**

Recent studies have found that interest groups filing amicus curiae in the states are more likely to file in elected state high courts and, more importantly, that elected judges are more likely to respond to the policy preferences of these groups. Despite this observed link between elected judiciaries and amici influence in state high courts, the actual

mechanism at work behind this influence has yet to be determined. Are elected judges responding to the democratic pressures of elections and campaign fundraising? Or are elected judges generally more willing to utilize information provided by interest groups because they understand that amicus participation serves as the democratic mechanism by which groups of citizens can advocate for outcomes in the courts? In order to determine if amicus influence is tied to the reelection concerns of judges, this study utilizes original data on the decision making of more than 556 elected judges from 38 states to test whether elected judges become more responsive to amici as elections approach. Results indicate that in areas of law where amicus participation is heavily populated by groups known to contribute to judicial campaigns, elected judges approaching reelection are more likely to rule in favor of these third-party groups. These results show that elected judges are not immune from the electoral connection that incentivizes other elected officials to pander to groups known to donate to reelection campaigns. However, within the judicial context, this electoral connection appears tied to a much smaller range of groups and cases.

**45. Katherine Riordan and Frank Fish**
**Department of Biology**

**Blue crab (*Callinectes sapidus*) swimming appendage maneuverability underwater**

The blue crab (*Callinectes sapidus)* is an intertidal species located in the swimming family Portunidae. Crabs are at an advantage with increased stability due to their low center of mass and a wide base for extra support. Depending on water flow conditions, the aquatic animals have to change body posture and orientation to deal with ambient flow. *C. sapidus* fifth pereopod has been modified into a swimming appendage (i.e., paddle). These paddles oscillate and act like hydrofoils, and *C. sapidus* are known to swim as soon as the legs are removed from the substrate. In this study, we were interested in learning how the paddles aid in locomotion, if there is a general pattern the paddles oscillate in, and if there is a difference in gait between sexes. High-speed video recordings of the crabs were collected and analyzed in Tracker software. The paddles were cut at the most proximal joint of the fifth pereopod (n=17). We found that the paddles alternated motions as they turned in a figure 8 pattern. Without the paddles, both sexes were unbalanced and bottom heavy. Female crabs had a larger y maximum displacement than males. Female crabs took longer strides and had a lower center of mass than males. The paddles are used to help the crabs escape quickly from predators. The paddles not only promote swimming, but they are also responsible for stability and balance for the crabs' maneuverability in the water medium.

**46. Kathleen Weber and Linda Stevenson**
**Department of Political Science**

**Migration as Transformation? Latina Migrant's Experiences in the Philadelphia Region**

Contrary to the news headlines that feature negative stories of immigrants at the federal level in the US, migration experiences may be empowering and/or transformational for immigrants and their communities. This presentation shows the results of an exploratory study conducted in the greater Philadelphia region using an original survey including questions used in United Nations, World Bank, and local Pew Hispanic surveys. The survey was used to document the ways in which their lives are changed by their immigration experiences, compared to their lives in their countries of origin. The results offer a complex mosaic of intersectional findings of ways in which female immigrants gain or lose power with the changes in their lives from the various experiences of enhanced economic opportunities, more security in their everyday lives, social changes in their households, and different kinds of access to community and political decision-making than in their countries of origin. These results have the potential to inform policy change related to the rights of immigrants in the United States and beyond.

**47. Mark Marrone, Teresa Lee and Mark Shuman**
**Department of Chemistry**

**Theobromine in Chocolate and its Lethality for Dogs**

It is well known that chocolate is dangerous for dogs to consume. Chocolate is known to contain the three methyl-xanthines: caffeine, theobromine and theophylline. Of these, it has previously been shown that theobromine is particularly toxic for dogs. The theobromine LD50 for dogs on a per kilogram of dog basis is known. Through use of an extraction protocol culminating in a Supercritical Fluid Chromatography separation and quantification, the concentration of theobromine in several commercial chocolate products has been measured and related to the LD50 for dogs. Not surprisingly, it was determined that the mass percent of theobromine in chocolate is directly related to

the amount of cacao present (the "darkness" of the chocolate). The results for six different popular chocolate products are presented.

**48. James Wheeler, Mark Marrone, Teresa Lee, David Dehm and Mark Shuman**
**Department of Chemistry**

**An Innovative "Green" Approach to a Cycloaddition Organic Synthesis Experiment**

The undergraduate curriculum for chemistry majors (and other science majors) contains Organic II Laboratory (CRL232) in which several experiments in chemical synthesis are performed by the students over the course of the semester. Historically, these experiments have been performed using traditional methods that are slow and which generate large amounts of hazardous organic waste. In addition, because of time constraints, the students are unable to evaluate the yield of their syntheses, only the purity of the products. One of the experiments has been chosen for modification to rectify these problems. The chosen reaction, a Diels-Alder cycloaddition, is now activated by microwave radiation which allows the reaction system to be aqueous instead of organic. The microwave reaction time is reduced by a factor of 3 for a product yield similar to that given by the traditional method. The students easily remove a sample from their reactors which after minimal workup is submitted for analysis by Supercritical Fluid Chromatography (SFC). The run time for the analysis is less than 4 minutes so a class of 18 students can get data within 90 minutes. The data tells them exactly how much product has been made. This can then be compared to their ultimate yield after cleanup and purification steps have been completed. The SFC method requires carbon dioxide and a very small amount of methanol. The entire process is faster, more information dense, "greener" and more sustainable.

**49. Ibtihal Alnahdi and John Pisciotta**
**Department of Biology**

**Electrically-driven Biological Nitrogen Fixation (e-BNF)**

Nitrogen makes up to 78% of the Earth's atmosphere and is an essential element for all life. Atmospheric nitrogen ($N_2$) must be fixed into forms that can be taken up and integrated as nucleic acids and amino acids by plants and animals. Nitrogen fixation is usually carried out by diazotrophic microbes using chemical or solar energy. Here we tested for electrically-driven Biological Nitrogen Fixation (e-BNF) using two diazotrophic pre-enrichments from fresh water or seawater. Five microbial electrolysis cells (MECs), two for freshwater, two for seawater, and an additional sterile control, were prepared. Each reactor consisted of two chambers, a cathode chamber and an anode chamber. Graphite served as the electrodes and a Ag/AgCl reference electrode was inserted into each cathode chamber. Nafion proton exchange membrane was clamped between the two chambers. Chambers were filled with 80 mL PBS buffer with salt being added for the seawater medium. Prior to inoculation, reactors were de-gassed 15 minutes with 20% CO2 with 80% N2 gas then connected to a potentiostat with cathode voltage set to -0.750 V. Cathode changer Gas Chromatography (GC) measurements quantified weekly headspace O2, N2, CO2 and CH4 gas changes over one month. Evidence of growth or biofilm formation, change in headspace nitrogen and microscopy used to characterize microbial composition. Over 4 weeks N2 decreased in reactors, while the control's N2 remained constant. Gram stains indicated the presence of Gram-negative bacteria. Detection of CH4 in seawater reactors revealed metabolically active Archaea.

**50. William Zang and Jennifer Maresh**
**Department of Biology**

**Relationship between phylogeny and conservation status of two closely related squamate families**

Snakes are underrepresented in conservation biology, however they serve important ecological and anthropological roles in wildlife population control and medicinal research. We used phylogenetic techniques to determine whether conservation status and/or population trends of species from the paraphyletic venomous snake families Elapidae and Lamprophiidae show a significant relationship with species relatedness. . Conservation statuses were recorded for 497 species using the IUCN Red List scale (Least Concern, Near Threatened, Vulnerable, Endangered, Critically Endangered). All analyses were performed in R 3.5.2. Phylogenetic trees were constructed for the two families. To estimate the extent to which relatedness predicts patterns of IUCN status similarity among these species, phylogenetic signals were estimated as Pagel's lambda (□). When AIC scores indicated the null model was unlikely, model fits were tested, where a p-value < 0.05 indicated a significant phylogenetic signal. When both families were tested together, the best-fit model indicated a strong phylogenetic signal to conservation status (□ = 1.0, p = 0.005). When tested separately, Elapids had a □ = 0.3 and p = 0.005, and the Lamprophids had a □□= 0.0, indicating the signal is

driven by the Elapids. Phylogenetic models of evolution have become an important strategy for conservation efforts in light of the current anthropogenic biodiversity crisis; however, for these initiatives to be successful, it is imperative to update the conservation statuses of snakes with current estimates of population levels on the IUCN website.

# Other Student Posters

**51. Grace Lawrence and Vishal Shah**
**College of the Sciences and Mathematics**

**Are Sterile Piercing Earrings Really Sterile?**

Around 80 to 90 percent of women have their ears pierced in the United States. At the time of piercing, there is an expectation that the piercing earrings are sterile. By testing a variety of earrings labeled as sterile in nutrient broth designed to grow bacteria, we see if they are contaminated by tracking the progress of those samples. After testing 34 piercing earrings labeled as sterile at the time of purchase, the results show 10 percent of the samples with contamination. More testing should be done with more piercing earrings to validate the results. To be certain the piercing earrings are sterile, people should use rubbing alcohol and a cotton swab to clean the piercing earring prior to use.