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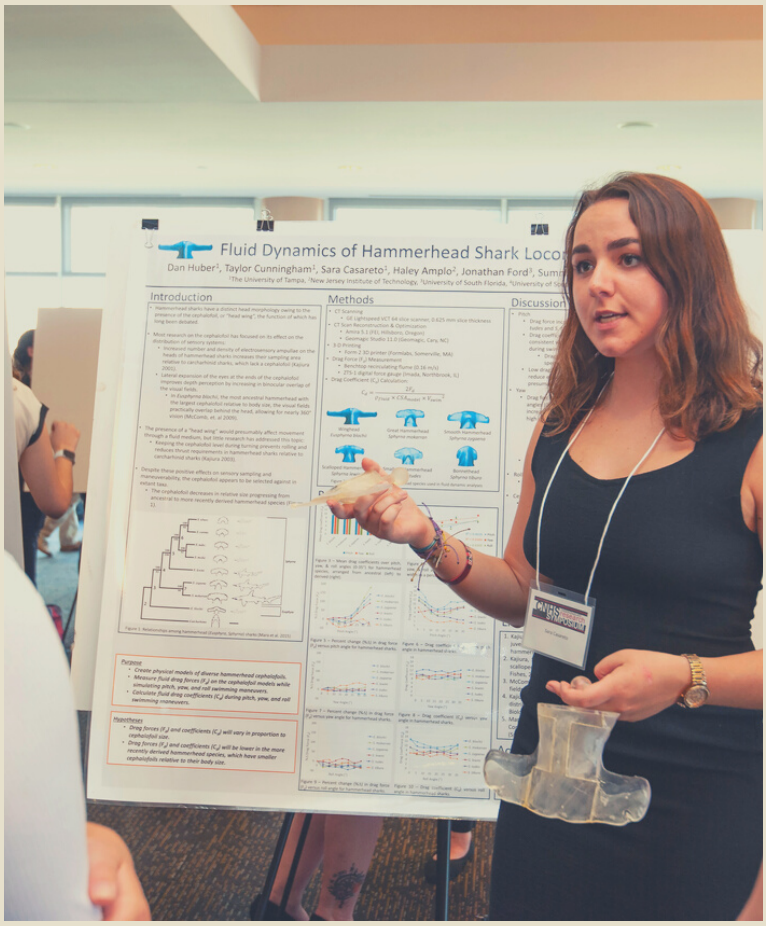

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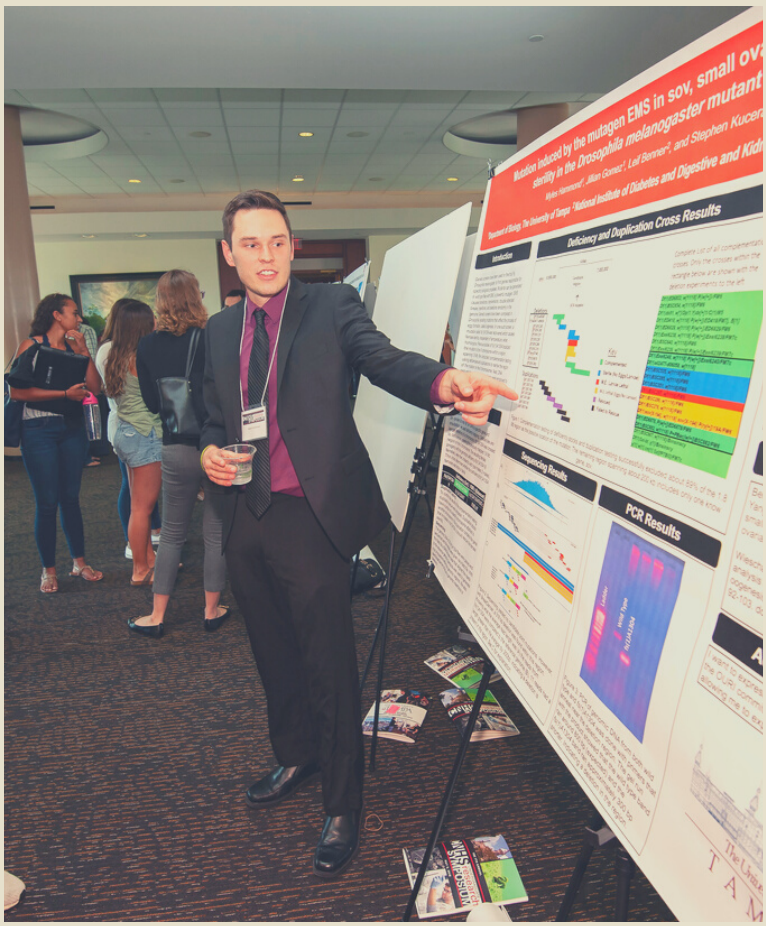

Class and Access to Governance in Burkina Faso

Julia Ingram, Political Science
Mentor: Dr. Kevin Fridy

In Burkina Faso there are many overlapping options for local governance both formal and informal. There are formal constitutionally defined institutions that theoretically offer outlets for citizens to use when trying to obtain something from their government. However, not all citizens choose these formal channels and not all the citizens who do choose them obtain optimal results. This is the central focus of this research paper: how do individual differences in class and socioeconomic status influence an individual's cognitive mapping of local governance? In other words, do citizens pursue different types of institutions based on their socioeconomic class in society to satisfy their needs?

The data for this project was collected through a Large-N survey of approximately 1000 respondents. The sites for these interviews spanned from North to South in the regions Centre-Sud, Centre, Plateau Central, Centre-Nord, and Sahel. The independent variable of class and socioeconomic status is operationalized by using measures from Oxford's Multidimensional Poverty Index. For the dependent variable of cognitive mapping of local governance, the survey asks participants questions about governance, such as: who they turn to when they need something hypothetical, who they have experience going to, and evaluation of the help they received.

Using Mobile Learning to Teach Spanish Vocabulary

Alysha Assaf, Spanish and Elementary Education
Mentor: Dr. Andrew DeMil

Over time, mobile devices have penetrated the classroom, requiring new and beneficial ways to implement classroom instruction. Research suggests that Short Message Service-based (SMS) instruction is an effective tool for acquiring second language (L2) vocabulary and idiom knowledge (Hayati, Jalilifar, & Mashhadi, 2011, Lu, 2008). Additionally, studies have found that students believe that mobile learning (m-learning) is beneficial to acquiring a second language (Cavus & Ibrahim, 2009, Hayati, Jalilifar, & Mashhadi, 2011, & Lu, 2008). This study examined whether m-learning can be improved by L2 definitions and sentence interpretation among university students of Spanish as a second language at the intermediate level. Native speakers of English (N= 29) received definitions of Spanish words in Spanish and sentences in Spanish on their mobile devices through a popular messaging application. The results demonstrate that vocabulary identification significantly improved in both groups but there was no significant difference between the definition and sentence interpretation groups. Our discussion explores the implications for classroom and mobile second language teaching.

The Origins of Racial Discrimination in Public Health: The 1793 Yellow Fever Epidemic of Philadelphia

Abigail Nelson, English
Mentor: Dr. Kacy Tillman

My research investigates how the origins of discriminatory rhetoric in public health started with the racist ideas of Matthew Carey and Benjamin Rush during the Yellow Fever Epidemic of 1793 Philadelphia. I use critical race theory to show how these ideas have been perpetuated in rhetoric by powerful individuals throughout history. Leaders of the African Society, Absalom Jones and Richard Allen, were eyewitnesses to the lack of healthcare and their relationship with Rush provides a perspective from African Americans during this time. Specifically, I argue that although Carey and Rush had opposing opinions on many subjects regarding medical practices, they both spread their prejudices in similar ways in their writing. I argue how the rhetoric that Rush and Carey used and other individuals in power have influenced the formation of public health. I ground these issues from the past to current issues in public health with instances of pregnant black women dying today of very curable diseases. The racist ideas and words that these men in power published back then has shaped the way that public health documents and the public health community treat people of color.

The Effect of the Sea Slug *Elysia clarki*'s Anti-predatory Chemical Defense on the Feeding Behavior and Long-term Memory of Blue Crab, *Callinectes sapidus*

Samantha Schreiter, Marine Science-Biology
Mentor: Dr. Michael Middlebrooks

Chemically derived defense mechanisms are one of various methods that aid organisms in their survival. Little is known about anti-predator defenses in sacoglossan sea slugs, however chemical defenses in the form of secondary metabolites may play a critical role in Elysia clarki's survival. This study investigates whether the blue crab, Callinectes sapidus, will learn to avoid unpalatable sea slugs through repeated exposure. To conduct this study, twenty-seven crabs were starved for four days and then offered E. clarki as a food item. Encounters were filmed, and crab behavior was categorized. This experiment was repeated weekly for ten, seven, three, and two weeks respective to each C. sapidus group. Crabs attacked and tried to eat slugs at a higher frequency than any other behaviors. However, there were no casualties of E. clarki when the crab attacked because they never consumed the slugs. Results suggests that the crabs do not retain long-term memories of the slug's feeding deterrent and that the sea slug's defense mechanism is successful in aiding them in their survival against ingestion. This also indicates that their defense may not prevent attacks but becomes effective after gustation occurs.

There is Something in the Water! Correlation of Trihalomethanes with Head and Neck Cancer in the Tampa Bay Area

Magen Hoch, Biology
Mentor: Dr. Kimberly Dobrinski

Total Trihalomethanes (TTHM's) are carcinogenic by-products that are formed due to the chlorination of drinking water. A headspace GC-MS method has been optimized for sensing the TTHM concentrations in a 30-zipcode region of Hillsborough county. These parameters were set in place to better detect the individual THMs: chloroform, bromoform, bromodichloromethane, dibromochloromethane concentrations, as well as to determine the free chlorine levels (determined by colorimeter) in the drinking water around the Tampa Bay area. For optimization of sensitivity, the following parameters were changed: flow rate from 1.0 mL/min to 0.8 mL/min, GC oven temperature from 80°C to 40°C, vial incubation time from 3m:ss to 5m:ss, speed of injection from 250µL/s to 500µL/s, and fill speed from 100µL/s to 200µL/s. These parameters have allowed the measurement of TTHM as low as ppb. The TTHM concentrations found in the drinking water were compared to the TTHM standards (EPA: 80 ppb, WHO:10 ppb, EWG: 0.15 ppb). Additionally, correlations between TTHM's found in drinking water and head-and-neck cancer rates by zipcode in the Tampa Bay area will be evaluated.

The Reductive Dehalogenation of Substituted Benzenes Utilizing Carbazole Derivatives as Photocatalysts

Tyler Weinhold, Chemistry
Mentor: Dr. Ashley Longstreet

Photoredox catalysis offers new methods to achieve radical transformations under mild conditions through a light-sensitive catalyst. Transition-metal complexes are commonly used as single-electron oxidants and reductants. Carbazoles are relatively inexpensive, metal-free and, upon excitation, can act as a strong reductant. Our group has synthesized carbazole derivatives that exhibit increased conjugation which allows for absorption of near-visible light and extends the lifetime of the radial cation. To demonstrate whether the carbazole derivatives could behave as a photocatalysts, the dehalogenation of aryl halides was investigated to understand the use of carbazoles as photocatalysts in a simple well-understood model reaction. Conversion of 4-bromobenzonitrile to benzonitrile was achieved with 88 % yield.

The Best Health & Safety Practices in University Fab Labs
Nicole Scotto, Public Health
Mentor: Dr. Tracy Zontek

Additive manufacturing, or 3D printing, has become a new and prominent technology in many areas of industry, including educational institutions and universities. Due to the emergence and explosive expansion of 3D printing, there are many crucial knowledge gaps and missing areas of literature regarding the best health and safety practices associated with university 3D printing laboratories. 3D printing is the process of heating and fusing thermoplastics and filaments through a computer aided design program, in which ultrafine particles (UFP), volatile organic compounds (VOC), aldehydes, and respirable dust particles are emitted into the air. In order to determine the best health and safety practices, the University of Tampa's new 3D printing laboratory (Fab Lab) was used to measure the aerosol and chemical concentrations emitted during the Fab Lab operation. Interviews with the University Fab Lab coordinator and faculty were conducted to help identify missing gaps of literature through the eyes of technical experts and to elucidate best practices. In conclusion, the data was used to identify the best health and safety recommendations for other colleges and university 3D printing laboratories to ensure the safety and health of both students and university staff members.

Tissue Specific Compensatory Regulation of Gene Expression Associated with Copy Number Variants in *Danio rerio*
Sherrea Brown, Biochemistry
Mentor: Dr. Kimberly Dobrinski

Copy number variants (CNVs) refer to the loss or gain of copies of a DNA region within the genome. While some CNVs enrich the diversity of an organism and play a role in species evolution, CNVs may also be linked to certain diseases such as neurological disorders, early onset obesity, and cancer. Danio rerio (zebrafish) is an excellent model organism for human development as well as disease. Zebrafish share 70% of genetic similarities with humans with 84% of genes associated with human disease also found in zebrafish. This study seeks to compare CNVs, miRNA expression levels, and gene expression levels within the kidney and liver of zebrafish. Array comparative genomic hybridization was used to determine CNV regions in 30 adult Tübingen zebrafish while expression arrays were used to measure gene expression as well as miRNA expression in kidney and liver in these same 30 fish. Expressive quantitative trait loci (eQTL) analysis (linear regression model in R) was used to explore how CNVs may affect gene expression and the regulatory role played by miRNAs. Ongoing analyses with these associations will investigate gene functionality and the compensatory regulation carried out by the cell through mechanisms such as miRNAs.

Generational Academic Stress among Immigrant Students

Anagha Surendra, Psychology
Mentor: Dr. Jennifer Blessing

With the U.S. being more ethnically diverse than it has ever been, so are current college students. Being a zero generation, first-generation, or second-generation immigrant places much emphasis on success and gaining a higher level of education. Parents of many immigrant children tend to endorse higher education. Children of Immigrant parents often view school performance as a significant portion of their lives when compared to non-immigrant groups (those who have lived three generations or more in the U.S.). This may lead to greater levels of stress when pertaining to academics.

In this study we are investigating how different generations of immigration impact levels of academic stress. Our hypothesis is that lower levels of generational immigrants (i.e. zero generation or first/second generation) will have higher levels of academic stress than those who have a history of 3 or more generations living in the United States. Academic stress will decrease as generational levels increase because the expectations and pressures from their parents will also decrease. This may be due to assimilating into a different culture that drastically differs in cultural values. As generations pass, those values may decrease in importance, and accordingly the stress to do well in academics.

Role of Microtubules on the Coalescence of Viral RNA Polymerase of TMEV

Devon Grey, Biology
Mentor: Dr. Eric Freundt

The ability of a virus to replicate often depends on its ability to hijack host-cell components. Many viruses utilize the cellular cytoskeleton as a highway to transport viral proteins to various locations within the cell where they facilitate genome replication or virion assembly. Theiler's murine encephalomyelitis virus (TMEV), which is in the family Picornaviridae and a relative of poliovirus, replicates its genome using a virally-expressed RNA-dependent RNA polymerase, designated 3D. Previous studies on poliovirus have shown that 3D polymerases bind to each other, ultimately forming a lattice that enhances RNA replication. How 3D comes together in TMEV-infected cells has not been reported previously. In this study, we examined influence of the cytoskeleton on localization of the 3D polymerase of TMEV. TMEV 3D was found to localize to discrete puncta that both decreased in number and increased in size over the course of the infection. We found that 3D localization depends on an intact microtubule network and disruption of the microtubule network also impairs viral replication. Additionally, we examined the role of microfilaments in localization of 3D. These results suggest that TMEV utilizes the cellular microtubule network to enable the 3D polymerases to interact and efficiently replicate the viral genome.

The Exploration of the Sexual Objectification of Women in Society

Jacqueline Zogby, Criminology/ Criminal Justice
Mentor: Dr. Kathryn Branch

The sexual objectification of women has remained a critical yet overlooked issue for many decades now. Popular media is undeniably stripping women of their basic human attributes and perceiving them as mere sexual objects. Consequently, this has created several socially acceptable or expected ways of being womanly or feminine. Current research has found that females are not only sexualized to a greater degree than males but are hypersexualized at alarmingly high rates. The issues that arise out of sexual objectification include sexual aggression, victim-blaming, and rape. The purpose of the current research is to review the recent literature examining the effects of objectification of women and, in so doing, theorize potential solutions as well as avenues for future research.

Henry B. Plant Park Phone Tour Project: A Historical Stroll

Jenna Moscaritolo, Mathematics; Sabrina Cabrera Rivera, Writing
Mentors: Dr. Aimee Whiteside, Dr. Andrew DeMil, and Dr. Stephen McFarland

The Plant Park Cell Phone Tour was created several years ago by the non-profit organization, Friends of Plant Park. It offers historical information about Plant Park, Tampa's oldest and largest public botanical garden established in 1891, which is now part of the University of Tampa. Two students, Jenna Moscaritolo and Sabrina Cabrera Rivera, worked with faculty members--Dr. Whiteside, Dr. McFarland, and Dr. DeMil--and Henry B. Plant Museum staff Cynthia Zinober and Heather Trubee to update the Henry B. Plant Park Cell Phone Tour. The two students worked with their clients to draft content to better fit the length of the tour, grab the attention, and meet the expectations of the participants. Sabrina translated the transcript into Spanish for our Spanish-speaking visitors, and she updated directions to each next site. Jenna developed a new smartphone tour, working with a third-party organization called GuideByCell, to engage guests with a virtual tour with an interactive map, historical photos, and updated pictures of the tour sites, audio files, and videos. With training from GuideByCell, she developed several prototypes to build the ideal interactive tour for all age types.

Abiotic and Biotic Habitat Preference of a Unique Hippocampus erectus Population

Matthew Gamache; Marine Science-Biology
Mentors: Dr. Heather Masonjones and Dr. Emily Rose

Management policies regarding wildlife are best regulated when the protected organisms are well understood. This study was organized to discern the habitat preferences and seasonal movement patterns of the endemic Lined Seahorse, Hippocampus erectus, in the anchialine lake, Sweetings Pond, in Eleuthera, The Bahamas, in order to better protect them and their habitats under the Seahorse National Park. By calculating the density of seahorses in seventy-four, 30 m by 2 m belt transects, hotspot analyses of the seahorses were conducted in ArcGIS to determine seahorse distribution throughout the pond. The hotspots overlaid temperature, salinity, and pH data, which were interpolated to show the layout of abiotic factors in the pond. Separate temperature preferences were seen between the dry and wet seasons: 24 oC to 25.5 oC and 27.5 oC to 32 oC, respectively. A common salinity preference of 35-38 ppt was seen across seasons, but pH did not have a spatially significant influence on the distribution. The type of holdfast that seahorses were found on was analyzed across the pond as the biotic factor. H. erectus demonstrated a preference for two species of Laurencia, one of the more dominant holdfast types in the pond. Lastly, movement of the seahorses across the seasons corresponded to annual zooplankton fluctuations. With this understanding of habitat preferences and movement patterns, Seahorse National Park can be better managed, and the seahorses and their habitats can receive better protection. Additional sampling of habitat, food, and reproductive behavior would generate effective models to predict the distribution and movement of H. erectus throughout Sweetings Pond.

Impact of Diet on Photosynthesis and Survival of Kleptoplastic Slug *Elysia papillosa*

Alexandra Nockengost, Marine Science-Biology
Mentor: Dr. Michael Middlebrooks

Elysia papillosa is one of several species of marine sacoglossan sea slugs which can temporarily photosynthesize by sequestering functional chloroplasts from its green algal food. The duration for which photosynthesis can be maintained varies for different sacoglossan species, however, their diet has also been shown to have a significant impact. To test the effect of diet on the duration of photosynthesis for E. papillosa, slugs were split into two treatment groups fed closely related algal species Penicillus capitatus, and P. lamourouxii. Prior to measurements, slugs were allowed to feed on their assigned group ab libum for two weeks at which point food was removed. Slugs were measured using a PAM fluorometer every two days as a proxy value for photosynthesis. E. papillosa fed P. capitatus had a faster decline in photosynthetic activity compared to those fed P. lamourouxii. Additionally, slugs fed P. lamourouxii survived longer. These results are surprising because E. papillosa is much more commonly found on P. capitatus in field. Whether this is a result of preferable taste, better cryptic refuge, or perhaps smaller filaments of P. capitatus allowing easier herbivory is unclear, but there is further need for research on E. papillosa ecology. This considerable difference in plastid maintenance and survivability found in E. papillosa based on algal donor suggests maintenance of plastids could vary based on plastid morphology or other unassessed factors.

Burkinabè Personality Traits and Support for Vigilantism

Ariana Ferraro, Political Science
Mentor: Dr. Kevin Fridy

The Big Five personality measurement assumes people have enduring internal psychological structure conceptualized by five core traits: extraversion, openness to experience, neuroticism (also referred to by its opposite emotional stability), conscientiousness, and agreeableness. Expression of personality traits varies with environmental stimuli, which cause characteristic adaptions to develop to help the individual fit into his/her social environment.

This paper's goal is to provide insight on how individual variations in stable psychological characteristics affect individual level responses to vigilantism in Burkina Faso. State weakness in Burkina Faso provides an ideal environment for groups to take the law into their own hands because vigilantism surges when the formal system fails to provide a proper level of security for its citizens. Utilizing data from a large-N survey conducted in June 2019, I used R statistical software to conduct a regression analysis where personality traits are used to predict support for vigilantism. Control variables considered are gender, socio-economic status, ethnicity, and region (North or South).

The intermingling of a few vigilante organizations and the well-established Islamist extremist groups in Burkina Faso make this study geopolitically relevant for regional security and for nations targeted by ethnic militias and/or Islamic terrorists.

Qualitative Inquiry into Vaping among College Students

Claudia Jimenez; Allison Barthel; Briana Lipski; Jenna George, Public Health
Mentor, Dr. Mary Martinasek

Background: The use of electronic nicotine delivery devices (ENDS) such as Juul and vapes have become a public health concern over the past year. The use of these devices results in inhalation of heavy metals, carcinogens, and respiratory irritants, as well, as high levels of nicotine. Understanding college student attitudes, perceptions and behaviors can help to inform future programs and social marketing campaigns aimed at curbing the behavior. This research was utilized to inform a survey that was disseminated across campus.

Methods: Fifty-four semi-structured interviews were conducted on campus at a medium sized liberal arts institution with both individuals who vaped and those who do not vape. Interviews were recorded for transcription and then coded using NVivo software.

Results: Students were most often influenced by their friends or attending a social event for introduction into vaping devices. Many students started vaping prior to starting college. Emerging themes were centered around peer social acceptability, disconnect between harm perception and the vapers, intrinsic benefits, parental help and trusted health sources.

Conclusions: Qualitative inquiry and literature reviews are the first steps in developing a social marketing campaign. By gathering differing perspectives to inform social marketing campaigns, deterrence from usage can be formulated and utilized on college campuses to influence those who are most likely to change their behaviors.

Using a Carbazole Derivative as a Photocatalyst in the Dehalogenation of Aryl Halides

Melissa Chin, Criminology
Mentor: Dr. Ashley Longstreet

Photoredox catalysis allows chemists to perform single-electron transformations through light excitation of a photocatalyst, which is either metal complex or organic molecule. This process is important compared to traditional single-electron transformations because it is selective, performed under mild conditions, generates less waste, and requires less toxic reagents. The purpose of this research was to determine if the molecule 9-mesityl-3,6-bis(4-methoxyphenyl)-9H-carbazole could be used as a photocatalyst. This carbazole derivative would be useful as a photocatalysts due to it being affordable, metal-free, and exhibiting unique redox properties. Here in, the carbazole derivative was demonstrated to work as a photocatalyst in the dehalogenation of aryl halides in the presence of an amine as a hydrogen donor. The reaction was first optimized using 4-bromobenzonitrile as a substrate. Once optimized, the 4-bromobenzonitrile was converted into the desired product, benzonitrile, in 88% yield after 48 hours. The method was then applied towards other aryl halide substrates. The substrates with electron withdrawing groups, such as 4-bromoacetophenone or 4-chlorobenzonitrile, were converted to their corresponding products in higher yields, whereas substrates without these groups only produced their desired products in low yields.

Spatial Analysis of Mark Recapture Data from an Endemic Seahorse Population from the Bahamas (*Hippocampus erectus*) Provides Critical Management Insights for Park Development

Megan Pinder, Environmental Science
Mentor: Dr. Heather Masonjones

We utilized both mark-recapture and facial recognition techniques to follow a saltwater lake population of lined seahorses (Hippocampus erectus). Sampling occurred between August 2018 and October 2019, using elastomer tags and facial patterns analyzed with the Interactive Individual Identification (I3S) program to confirm that facial markings work to identify individuals in a 25x25 meter grid established in the north and south ends of the lake. Closed population estimation techniques were used to determine that the southern population (0.065 seahorses m-2) was significantly smaller than the north (0.14 seahorses m-2) when measured directly, with estimations based on mark recapture 341% higher in the south and 825% higher in the northern populations. Additionally, ArcGis was used to assess differences in the spatial distribution, abundance and movement of the seahorses between the two populations. Northern differences exist in where males, females and juveniles are found, but in the South distribution did not vary by sex. At both locations, juveniles favor the shallowest part of the grid. The Southern population was mapped in more detail, illustrating the greater the disturbance by researchers, the further seahorses moved. Careful management planning will need to balance seahorse population demographics and human use of the ecosystem.

National Human Rights Institutions Coding Project: African Institutions

Katie Sturmer, Political Science
Mentor: Dr. Ryan Welch

National Human Rights Institutions (NHRI) are ombudsmen offices or commissions established by a national government to promote and protect human rights. The Paris Principles, Universal Declaration of Human Rights, and individual state's constitutionalized rights provide the foundation from which the NHRI functions in each state. This allows for wide variety in the function, strength, and power of each NHRI. To provide some comparison the Global Alliance of National Human Rights Institutions (GANHRI) grades each NHRI on a letter scale from A to C, with A being highest accordance to the Paris Principles. The data was collected primarily from published annual reports and constitutional mandates of the 21 'A' ranking institutions in Africa. This study examines the variability among the African 'A' NHRI's with focus on the institutions scope, what human rights they are mandated to protect, and the institutions power, how they can promote and protect citizens human rights.

Tampa Bay Ocean Acidification and the Influence of Dissolved Organic Carbon on Accurate Carbonate System Measurements

Miranda Conley, Forensic Science
Mentor: Dr. Rob Masserini

Ocean acidification (OA) is the process by which sea water absorbs atmospheric carbon dioxide (CO_2) As the concentration of CO_2 in seawater increases, it causes the pH and the carbonate (CO_3^{2-}) ion concentration within the seawater to decrease. This lowered pH can make it impossible for certain species to survive, which in turn can have catastrophic effects ecosystems. OA is monitored through the measurement of dissolved inorganic carbon, pCO_2, pH, and total alkalinity (TA). The OA monitoring program in Tampa Bay has found that the measured TA is higher than the calculated TA. In this study, we sought to determine if organic alkalinity from dissolved organic carbon (DOC) could be responsible for the difference between measured and calculated TA, and if so, what the predominate forms of organic matter present were. DOC was characterized via Fourier-Transform Ion Cyclotron Resonance Mass Spectrometry. Phosphate, silicic acid and pH were evaluated using absorbance-based methods, and total CO_2 was determined via titration in an open vessel. Measured TA was on average 20 µmol/kg greater than the calculated TA. Nutrient analysis indicated that although silicic acid and phosphate are present in Tampa Bay, these nutrients contributed approximately 2 µmol/kg to TA. However, the contribution of DOC suggested that organic compounds could be responsible for 8 µmol/kg of the TA of alkalinity. This indicated that the organic alkalinity is likely responsible for 40% of the difference between measured and calculated TA. The average mass to charge ratio of the organic milieu was 350, with most compounds ranging from 200-500, and van Krevlen analysis indicates that most organic compounds were proteins.

Gender and Perceptions of Security among Burkinabè

Cheyenne Lee, Political Science
Mentor: Dr. Kevin Fridy

This paper takes a gendered perspective to the perception of security, hypothesizing that women in Burkina Faso have a significantly different view of security than their male counterparts. A survey conducted in summer 2019 from the south of Burkina Faso to the north asks respondents to give an inventory of the current safety situation and to evaluate the threat of various actors throughout the Burkinabè security theater. I am interested to see if women answer these questions differently than do men.
As Joshua Goldstein has meticulously documented, women experience war differently than men. Though Burkina Faso's conflict between government forces, local ethnic militias, and Islamic terrorist organizations has not often been characterized as a civil war, the level of violence has risen to the point where many conflicts have received this designation. The roles of perpetrators of war and protectors of the home are often assigned to men. To women the roles of supporters and victims are more commonly assigned. Given these tendencies, one would expect female respondents to view their safety as more precarious than their male neighbors and males to have more defined perceptions of the perpetrators than their female neighbors.

Do Sustainable Methods Affect the Socioeconomic Development of a Country?

Brooke Venturo, International Studies-Political Science
Mentor: Dr. Ryan Welch

This paper explores how primary energy consumption, active sustainable policies, and ethical, society-focused government participation correlate with socioeconomic development. I argue that these sustainable methods positively and statistically significantly affect the socioeconomic development of a country. This research is important because in today's world, there is a present and worsening problem of environmental damage, resource depletion, and overall health concern with the current socioeconomic development methods. There is a crucial need to adapt sustainable practices in order to preserve a bright and healthy future for upcoming generations. My findings with my variables show that there are positive and significant influences on development through real GDP. There variations in the overall patterns and sample sizes that create opportunities for further research in sustainable socioeconomic development methods.

Surface Water Injection into the Floridan Aquifer: Biogeochemical Transformations and Ramifications

Carley Reid, Forensic Science
Mentor: Dr. Rob Masserini

Aquifer storage and recovery (ASR) is a component of the Comprehensive Everglades Restoration Plan. ASR is performed via the extraction of water from the Kissimmee River, injection into the Upper Floridan Aquifer (UFA), and re-injection into the Kissimmee River. This study addresses the biogeochemical transformations involved during ASR in order to elucidate the potential ramifications of this process. Fourier Transform Ion Cyclotron Resonance Mass Spectrometry (FT-ICR-MS) was used to characterize the dissolved organic carbon (DOC) pool of the Kissimmee River and the UFA. Compounds were sorted into compound classes and analyzed by percent relative abundance, total carbon number, and hydrogen/carbon ratios. Consumption and production of nitrate (NO3-), nitrite (NO2-), ammonium (NH4+), and phosphate (PO43-) was quantified by absorbance-based colorimetric techniques. Dissolved organic matter was recalcitrant over time, and was primarily composed of oxygen-containing compounds. Denitrification in the presence of the UFA's natural microbial communities was observed in two nutrient quantitation experiments which simulated the addition of Kissimmee River water to the UFA. Ammonium concentrations are naturally high in the UFA and shown to persist over time. These ammonium concentrations may contribute to the stimulated biomass of 0.0477 mg chlorophyll per liter of water upon reinjection of stored water into the Kissimmee River.

Quantifying Sexually Selected Traits in the Female Gulf Pipefish (*Syngnathus scovelli*)

Coley Tosto, Environmental Science
Mentor: Dr. Emily Rose

Reliably quantifying the strength of visual sexual signals, such as iridescence, has been challenging. The Iridescence Detection and Isolation Algorithm (IDIA) was designed to isolate the iridescent signal from photographs for quantification of ornamentation. The Gulf pipefish, S. scovelli, served as a model system due to their sex-role-reversed polyandrous mating system and sexual dimorphism with females possessing sexually selected iridescent bands on their abdomens. Using the IDIA, female iridescence was reported in two ways, individual band iridescence and iridescence of their torso. With this program, we were able to detect geographical variation in female ornamentation. Female pipefish from the Florida coast had greater iridescence compared to the Texas coast. However, lab-reared fish from a Texas parental population showed the greatest iridescence overall, indicating environmental conditions, such as turbidity, could affect the strength of female visual signals. The IDIA was also used for an environmental application by detecting the development of iridescence in male pipefish exposed to synthetic estrogen. Exposed males expressed banding patterns with iridescence levels within the range of females. Results from this study confirm the feasibility of using the IDIA for measuring sexually selected traits and investigating the effect of estrogen exposure in natural populations.

College Students' Knowledge, Attitudes, and Intended Use of Mental Health Resources

Abigail Nerogic; Marimyr Bosque; Hannah DeCosta; Nathaniel Mansour and
Alexander Rolle; Psychology
Mentor: Dr. Erica Yuen

The goal of this study was to examine how viewing informational/promotional brochures regarding mental health resources offered on campus will affect treatment attitudes, stigma, willingness/intent to seek treatment and knowledge/awareness of resources. A total of 64 participants were recruited from the University of Tampa and included in the preliminary results. Each participant was asked to read an informational brochure regarding mental health resources (Experimental group) or general campus facts (Control group) and then respond to the dependent measures. Our main hypothesis was that participants who view informational brochures regarding mental health resources will have more positive attitudes (e.g., less stigma) towards seeking treatment than those who do not view the mental health brochure. Preliminary analyses found that viewing the mental health resources brochure led to significantly increased scores on the Knowledge of Mental Health Resources Quiz and intentions to seek help from a formal source. Furthermore, willingness to engage in help seeking behavior trended towards significance. Perceived public stigma, personal stigma, self-stigma of seeking help, attitudes towards seeking professional help, and intentions to seek help from an informal source were not impacted. These results indicate that viewing a mental health brochure has an impact on willingness and intent to seek professional help.

An Exploration of How Student Perceptions of Gender Identity and Sexual Orientation Affect Reporting Rates of Sexual Assault

Trinity Clark, Criminology-Criminal Justice
Mentor: Dr. Kathryn Branch

This project is a study of college students' perceptions regarding gender identity and sexual orientation affecting reporting rates of sexual assault. Even though this field of study is growing, there is still much to be explored and understood. The purpose for this study is to show that there are still biases and stereotyping in society, even when it comes to victimization. I want to explore why people still form these opinions and how I can use this information to better educate the public. No victim should be scared to report a crime because of societal beliefs regarding their own body.

Foreign Direct Investment on the Development of Underdeveloped and Developing Countries

Gabrielle McSwain, International Studies
Mentor: Dr. Ryan Welch

What kind of impact does Foreign Direct Investment (FDI) have on the development of underdeveloped and developing countries? There are many reasons why a state would need or want to intervene in the affairs of another, especially in the case of investment. Instances like humanitarian crisis, restructuring core businesses and war are main examples. But what must be explored when discussing foreign direct investment are 1) the agenda of states who invest and 2) the long term effects of said investments. This study defines the key actors and principles of foreign direct investment and hypothesizes that foreign direct investment has an overall neutral/negative impact on a state's overall development.

Impact of Corruption on Economic Development

Ana Castaneda Galdos, International Studies
Mentor: Dr. Ryan Welch

What is the impact of corruption on economic development? Many researchers explored the effects of corruption on a country's political and economic system, some focusing exclusively on the impact corruption on economic performance in developing nations. Many scholars debate the impact of corruption on a country's economic performance, as it either supports or not the "sand on wheels" versus "greases the wheels" hypothesis. Thus far, the findings suggest that impact of corruption on both political and economic system vary greatly in developing nations. This study continues to explore the role of public sector corruption on economic development, by focusing on changes in foreign direct investment (FDI), and annual GDP growth rates, and controlling for political accountability through rule of law and property rights. Using statistical analysis in 226 countries both developed and developing nations, over the years 1960-2017, I find that as corruption levels increase, economic growth decrease. However when evaluating investment, findings support the "greasing the wheels" hypothesis, that is for every unit increase in corruption, investment levels in some countries will increase as well. Nonetheless when controlling for property rights and rule of law, property rights play a bigger role on decreasing market attractiveness.

Memory for Medical Terms: Overconfidence, Yet No Picture Superiority

Bailey Joy, Psychology
Mentor: Dr. Sara Festini

Superior memory performance when pictorial illustrations are present (i.e., the picture superiority effect) has been well documented in various experimental contexts (e.g., see Carney & Levin, 2002). While the benefit of illustrations accompanying text for comprehension has been widely studied, most of these studies assess conceptual information gathered from long paragraphs or, conversely, memory for simple words or pictures. Instead, the present research focused on definitions of medical terminology, which are inherently complex and require precision during recall. Participants studied medical terms that referred to conditions of the throat, nose, eyes, bones, lungs, and skin (16 terms total). A subset of the terms were presented with an accompanying illustration. After studying each concept, participants provided an immediate judgment of learning (JOL). Recall and recognition memory tests were administered after all terms had been studied. Judgments of learning indicated overconfidence. A picture superiority effect was not observed on either recall or recognition memory tests, potentially due to the conceptual and perceptual similarity of the medical illustrations.

The Economical Effects of Immigration Openness

Armando Martinez, International Studies
Mentor: Dr. Ryan Welch

Does an increase of immigration, freer immigration policy, and movement of migrant laborer increase economic growth? Many scholars research and study the effects of immigrants in a host nation, from its political effects to its social effects, but many primarily focus on its economic effects. So far, there's been many debates on the benefits and disadvantages of immigration into the economy. This article continues that discussion by closely evaluating immigration openness from high and low skilled migrants on a specific aspect of the economy - economic growth. Economic growth is defined by the Library of Economics and Liberty as an "increase in the capacity of an economy to produce goods and services, compared from one period of time to another. It can be measured in nominal or real terms, the latter of which is adjusted for inflation. Traditionally, aggregate economic growth is measured in terms of Gross National Product (GNP) or Gross Domestic Product (GDP)" (Jim Chappelow 2019). Using statistical data of economic growth and immigration openness, I make the argument that the increase of immigration openness will result in an increase of economic growth, primally in OECD (Organization for Economic Co-operation and Development) member states. Unfortunately the outcome of testing my argument was negative and contradicts it. I actually found an insignificant negative correlation between immigration openness and economic growth.

Assessment of Microbial Presence on Waterpipe Tobacco Machines

Frederic Montz, Biology
Mentor: Dr. Kimberly Dobrinski

Waterpipe tobacco smoking has become prevalent among adolescents and college students throughout the United States. Smoke travels down the stem through a water base, and out the mouthpiece, but lack of knowledge on the prevalence of microbial organisms on waterpipe tobacco machines has led to poor sanitation. Ten Hookah Bars were randomly selected in the Tampa Bay region. The mouthpiece, hose, and connector were swabbed and plated using 5% Sheep's Blood Agar, Chocolate Agar, and MacConkey agar. We hypothesize that microbial organisms would be present on the waterpipe tobacco machines. Staphylococcus epidermis has been identified on the connector and hose apparatus. Staphylococcus aureus has been identified on the hose apparatus. In addition to analysis of microbial organisms via plate growth and biochemical testing to determine organism viability, organism presence has been tested with TaqMan Assays for respiratory tract microbiota profiling. This method utilizes the TaqMan Array Card-format and detects 42 respiratory tract viral, bacterial, and fungal microbes. Moraxella catarrhalis and adenovirus were identified from the TaqMan Array Card. The identification of microbial species on waterpipe tobacco machines is a step toward creating effective laws towards toward the regulation and sanitation of shisha tobacco and waterpipe tobacco lounges.

Indoor Air Quality: Carbon Monoxide Levels for Hookah Lounge Patrons and Workers

Frederic Montz, Biology
Mentor: Dr. Kimberly Dobrinski

Waterpipe tobacco machines allow patrons to consume particulate matter and carbon monoxide. Carbon monoxide (CO) is inhaled and released into the ambient air of hookah lounges. CO has a higher binding affinity for hemoglobin compared to oxygen and high amounts of inhaled CO may lead to CO poisoning. Long-term tobacco smokers exposed to CO have been found to have increased cognitive impairment. Additionally, hookah patrons have been shown to have mean CO levels that increase from 6.5 ppm to 58.2 ppm before and after a session. In order to investigate CO levels contributing to primary and secondary exposure, ten hookah bars were selected throughout the Tampa Bay area to measure ambient particulate matter and CO levels. Particulate matter measurements were assessed using a TSI SidePak AM 510 Aerosol. Carbon monoxide measurements were assessed with a Digital Carbon Monoxide Detector. Measurements were taken in parts per million (ppm) and recorded in 5 minute intervals over a 4-hour period. Welch's ANOVA for both particulate matter and carbon monoxide showed significant differences among different hookah lounges in the Tampa Bay area. Additionally, values of CO in hookah lounges are ten to 20 times higher than CO values found in ambient air.

The War on Oil Prices

Mariah Elkins, Political Science and International Studies
Mentor: Dr. Ryan Welch

In 1960 the Organization of the Petroleum Exporting countries was established. This led to a monopoly in the oil industry which consequently plays a role in using their monopoly to manipulate political relations through oil supply on the global market; as political relations worsen between countries, this directly increases oil prices. Consequently, when a global player engages in war against an OPEC country, the supply of oil is pulled from the market until the non OPEC country submits. Some parties argue that oil prices are volatile to the market and because of non-stationary commodity prices. This means that they think the price of oil floats with the international market and not because of international players purposely withholding supply in order to drive up the price for their own political benefits. This paper looks at oil exports from Petroleum Prices from Ross and Mahdavi (2015) and examines how they fluctuate when tested against UCDP/PRIO Armed Conflict Dataset [PO].

Diet and Range Expansion of the Sea Slug *Felimare ruthae*

Daniela Gutierrez Andrade, Marine Science-Biology
Mentor: Dr. Michael Middlebrooks

Chromodorid nudibranchs are carnivorous sea slugs that have a highly specialized diet, typically feeding on only 1-2 species of sponge. The chromodorid Felimare ruthae feeds on sponges in the genus Dysidea. It is found in the Caribbean including the southern Gulf of Mexico, but had never been reported on Florida's Gulf Coast. In 2019 a population of F. ruthae appeared on the limestone ledges off of Clearwater, Florida. Surveys were conducted to document the abundance of the nudibranch, and the substrate on which it was found . The slug was primarily found crawling and feeding on a large species of sponge. Samples of the sponge were analyzed through DNA barcoding which determined it was actually in the genus Spongia. This suggests that in addition to a range expansion, F. ruthae underwent a diet expansion. Sponges produce defensive secondary metabolites and the metabolites found in Dysidea are not the same to those in Spongia. F. ruthae's new food source suggests that it had to develop mechanisms that allow it to ingest the chemicals coming from Spongia. The processes that allowed the nudibranch to expand its distribution are still unknown.

The Relationship Between Foreign Direct Investment and Nationalism

Samsara Lavaggi, International Studies and International Business and Marketing
Mentors: Dr. Liv Coleman and Dr. Ryan Welch

Since the 1960's, states experienced a rise in the significance of foreign direct investment, as it has been an indicator of a countries economic prospect and attractiveness for future investment. A multitude of research conducted by different scholars argue, such as Hoffman and Lee, that ethnocentrism and economic nationalism lead to a decline in foreign direct investments (FDIs), this research suggest nationalistic sentiment as the initiating factors which leads to a decrease in FDI inflows. The purpose of this paper is to focus on the relationship between nationalism and FDI in developed and developing markets, seeking to establish whether the growth in nationalist parties in states leads to a decline in FDI. Leading to the question, does the rise in nationalism decrease foreign direct investment? By using statistical analysis of 193 countries and conducting a linear regression model, the results of this research are negative.

Psychometric Evaluation of Interpersonal Dyad Video Content

Jessica LaFontaine, Psychology
Mentor: Dr. Meredith Elzy

Interpersonal reactions to our emotions help to shape the way we view ourselves and others, and interpret our internal processes. Emotional validation occurs when someone displays comprehension and acceptance of another person's emotional experiences. In contrast, emotional invalidation is the rejection or criticism of a person's emotional experience (Linehan, 1993). Previous research has focused on individual's past experiences with these constructs. It is important to begin looking at these constructs as they are occurring. One approach to this is having pre-validated videos that participants view in experimental research studies. The purpose of the current study is to validate the presence of emotionally invalidating, emotionally validating, and neutral behaviors in three recordings involving a scripted interaction between two students. Participants completed a behavioral checklist after they watched each video to determine whether each behavior on the checklist was present during the interaction. In order to evaluate the psychometric quality of the videos, observational responses will be coded as correct/incorrect and percentage scores will be calculated. We will also conduct a one-way ANOVA comparing levels of emotionally invalidating behaviors across conditions to establish content validity. Statistical analyses are in progress and results will be discussed.

Humor Styles, Gender Differences, and Receptivity to Sexual Advances

Michelle Mooney, Psychology and Applied Sociology
Mentor: Dr. Deletha Hardin

This research analyzes how different humor styles (negative or positive) affect how likely an individual will accept a sexual invitation through the use of various pick-up lines. In today's societal world, much of the access one has to "dating" is through apps such as Tinder and Bumble. These dating apps are a common space to use humorous pick-up lines in order to try to get the other person to want to engage in sexual behaviors with them. We predict that the more humorous individuals are, the more accepting they are toward sexual invitations. Specifically, females will be more responsive to more positive humor styles while males will have more of a preference in the humor style among pick-up lines.

A Public Choice Analysis of the US Military and the Environment

Alexandra Marter, Environmental Science
Mentor: Dr. Abigail Blanco

The purpose of our research paper is to understand the relationship between the U.S. military and the environment, paying particular attention to the negative unintended consequences of militarism on the environment. Utilizing the tools of public choice economics, we explore several Public Choice Economics issues including: the ignorance of voters, the power of special interest groups, and the immense bureaucratic growth patterns of the Department of Defense (DOD). In particular, we use these Public Choice issues as a framework for understanding environmental destruction in a case study of marine mammals and US Navy sonar use. With these insights, we argue that the severe negative environmental consequences generated as a result of US military activity are unlikely to stop under current democratic constraints. The environmental consequences of war and military buildup is an understudied topic. Furthermore, a Public Choice economics framework has never yet been applied to this topic, offering new insight to the problem of US military environmental destruction.

James Joyce's Portrayal of Women in His Early Works

Olivia Parsley
Mentor: Dr. Kathleen Ochshorn

James Joyce's A Portrait of the Artist as a Young Man illustrates the consequences of one artist answering the call of artistry: the abandonment of country and that country's religion and values, and the endless pursuit of inspiration and beauty. From this arises the examination of the male artist's relationship to women. Using Portrait as the guide for my discussion, as well as Exiles and select short stories from Dubliners, I examine Joyce's primary ideas about women as seen in his early writing. Throughout Portrait, the adolescent Stephen Dedalus views women in various ways: as inspiration for the artist, as figures who spark epiphanies, and as reminders of the net by which he must fly. Stephen, much like young Joyce himself, feels the urge to explore the world of art, literature, and aesthetics, proclaiming: "I will try to express myself in some mode of life or art as freely as I can and as wholly as I can" and will "forge in the smithy of my soul the uncreated conscience of my race" (Joyce, Portrait 218, 224). Women play a contributing role in Stephen's path to artistry, and ultimately Joyce paints a portrait of women in his writing that is positive. It is evident in Joyce's fiction that women not only influenced his perception of the world, but that it was women who primarily nurtured and supported him during his development as an artist.

Americans' Knowledge and Perceptions of Genetic Counselors: A National Sample

Christina Pasca, Applied Sociology
Mentor: Dr. Ryan Cragun

With growth in utilization of genetic testing, it may be valuable to assess the public's awareness and attitudes of genetic counseling. No prior studies have asked a nationally representative sample of Americans about their awareness of genetic counseling or interest in utilizing genetic counseling services. We examine whether Americans are aware of genetic counseling and their likelihood of requesting genetic counseling were they to suspect they have a genetic condition. Despite the 50 year existence of the genetic counseling profession, a substantial majority of the U.S. population continues to be unaware of the profession. Although neutral or positive interest in receiving genetic counseling is common once people are made aware of the profession, negative attitudes toward the profession still exist.

The Retinal Pigments of Filter-feeding Sharks and their Role in Visual Foraging Ecology

Katherine Serba, Marine Science-Biology
Mentor: Dr. Jeffry Fasick

The spectral tuning properties of the whale shark, basking shark, and megamouth shark rod (Rh1) and long-wavelength sensitive (LWS) cone visual pigments were examined to determine whether these retinal pigments have adapted to the broadband light available for surface foraging, or to the narrowband light available at depth. Published whale shark Rh1 and LWS cone opsin genes were used to design primers for amplification and sequencing of the opsin proteins from basking and megamouth sharks. Basking and megamouth shark Rh1 and LWS cone coding sequences were PCR amplified and sequenced to identify amino acids critical for spectral tuning. The predicted absorbance maxima (λmax) for the whale, basking, and megamouth shark Rh1 were 496 nm, 496 nm, and 486 nm, respectively. The amino acid sequence for the whale and basking shark LWS cone resulted in predicted λmax values near 500 nm. We propose that the spectral tuning properties of the Rh1 and LWS cone in whale and basking sharks are likely an adaptation to the broadband light spectrum available at the surface, while the megamouth shark Rh1 pigment is likely an adaptation to the narrowband light spectrum available in deeper waters.

Gender Animus and Support for Police Militarization

Christina Pasca, Applied Sociology
Mentor: Dr. Ryan Welch

Does gender animus increase support for police militarization? This question is particularly relevant in light of the recent events in Ferguson, Missouri, in which protests of a police shooting brought police militarization to national attention. It is a highly contested topic due to this recent spotlight as well as its growth, leading many scholars to look its effects. We believe that it is also important to look at what predicts officers support of their militarization, such as social influences. But why gender? Scholars have explored the relationship between gender and police extensively, as policing is a profession which caters to masculine attributes. Not only that, but identity theory explains that someone who identifies as masculine will make their actions and decisions according to this identity. For these reasons, we argue that increased gender animus predicts support for police militarization. We surveyed a large metropolitan police department and asked questions regarding gender and police militarization. We then analyzed the data using linear regression tests and found that increased gender animus does significantly predict increased support for police militarization.