ABSTRACTS

Clayton State University

Student Academic Conference & Showcase

April 25-26, 2019

ORAL PRESENTATIONS

The Laws of the Universe

Nicolas Jordan

ADVISOR Alexander Hall | *Philosophy*

Throughout human history man-made laws have failed to match up with divine law. Many philosophers believe in the existence of some deity ordering intelligence. This belief has led to the natural law theory, which stipulates that a guiding intelligence or deity has ordered creation such that creatures naturally seek what this deity, say God, would have them do. Hence, our world is living neither virtuously nor in accordance with God's will. This causes people to create laws that do harm to their own and others' societies. In order to rectify the absence of good, we need to study the laws of various nations. By doing this we can see which laws cause societies to either preserve or destroy cities. This will also help us to see why some political parties conduct policies that are beneficial, and some enact policies that are detrimental. However, in order to fully aid our world, we must first educate people on the definition of natural law and the various misinterpretations of natural law that have ruined societies. By understanding the concepts underlying natural law then societies can create man-made laws which are universal. Being educated about the penalties of unvirtuous people will strike a sense of fear causing societies to change their laws for the better. By doing this, we set forth a virtuous world that is living according to God's will rather than forming our own will and feeling dissonance internally.

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Diary of a Mad Housewife - Charlotte Perkins Gilman "The Yellow Wallpaper"

Martha Jones

ADVISOR Gwendolyn Harold | *Interdisciplinary Studies*

Charlotte Perkins Gilman wrote "The Yellow Wallpaper" (1892) after undergoing a "rest cure" treatment for her own nervous breakdown, resulting from what we now call postpartum depression. The rest cure treatment, developed by Dr. Silas Mitchell, included total bed rest, with no physical activity, total isolation, no reading, writing or any intellectual stimulation for a minimum of six weeks. After three months on the treatment, Gilman stated she "narrowly escaped mental ruin." Using all her "intelligence that remained", she wrote her short story hoping Dr. Mitchell would alter his treatment. Gilman also wished to warn other women living in the late 19th century of the dangers of the rest cure treatment that not only made her feel worse than when she started, but also "insane".

Using the psychotic breakdown of her protagonist Jane, Gilman illustrates the dangers of what could happen to women unable to escape the male dominated medical treatment. The reader sees Jane's husband, who is also a physician, tell her, "I am a doctor, dear, and I know [what is best for you]" (Gilman 50). Gilman sends a warning to women against the 'female entrapment' of the gender-biased medical 'rest cure' that treated women as childlike, an invalid, or 'insane.' The author uses Jane, as she struggles against her husband and doctor, to point out that all women need to define their own lives and create their own 'self-cure,' full of intellectual and physical activity outside the domestic sphere. Gilman sounds the trumpet of warning that if women do not take control of their own lives they may become silenced and controlled by a society that might literally leave them no other escape than insanity.

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The Legacy of Savonarola

Justin Palmer

ADVISOR David Gilbert | *Social Sciences*

This paper compares the legacies of Martin Luther and Girolamo Savonarola. It focuses on who Savonrola was and how he came to be in Florence Italy and his fate thereafter. It covers how why Savonarola's legacy is not as popular and extensive as Martin Luther's. The paper discovers that Savonarola is in fact remembered and begins to uncover the truth about Savonarola's legacy.

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Social Realism in Drama

Troy Hickom
ADVISOR Susan Copeland | *English*

Social realism was a movement that influenced artists, writers, and expressionists worldwide and began during the mid-nineteenth century in Europe but gained much traction during the mid-twentieth century, especially in Great Britain. Originally fueled by "reaction against bourgeois styles such as romanticism," British writers, including John Osborne and Shelagh Delaney, channeled this realist style to illustrate the struggles of the working class in a realistic approach (Mercadal). This separated Osborne and Delaney from typical romantic and traditional writers, as they intended not only to entertain but to portray a serious message of struggle that cannot be missed. In critically analyzing Look Back in Anger and A Taste of Honey, these kitchen sink dramas contain similar themes and modes that can be utilized to better understand social realism. Osborne and Delaney write incredible dramas that utilize distinct characteristics of social realism, including authentic settings, the difficulty of real-life issues such as poverty, pregnancy, which are portrayed through believable dialog. Each of these modes is utilized not only to simply define social realism but also to truly connect to its audience through relatable scenarios that challenge societal norms.

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"Love Taps": A Rhetorical Analysis of A Different World's Domestic Violence Episode

Taylor A. Goodridge
ADVISOR Michael Lindsay | *English*

A Different World is a TV series set at an HBCU, where kids of all backgrounds experience the different challenges life brings. This show is known for its publication of African American men and women's experience through life, and it tests the idea of what should be learned versus what has been taught to African American students in universities. The production of the various episodes teach life lessons that relate to the black experience and overall college experience. The episode "Love Taps" not only addresses domestic violence, but it reveals the down play of a serious topic created by the use of laughter. The best way to address the topic of behavior in domestic violence in this episode is by approaching the subject with a rhetorical standpoint. A Different World produced "Love Taps" to project to the audience that society's problem with domestic violence should be constantly addressed and taken seriously. Using rhetorical analysis, this research finds there is more learned about the abusive character other than how the character abuses. Further textual analysis reveals the development of a predator and prey dynamic between the male and female characters.

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The effect of stride length training on muscular activity and energy cost during walking

Travet Witherspoon, Jr.

ADVISOR Hae Ryong Chung | *Health and Fitness Management*

Human bipedalism is a unique locomotive form of terrestrial movement. To maintain this form of locomotion humans have adopted various strategies to minimize and conserve energy. The self-selected locomotive pace in humans is when the most efficient energy cost can be maintained. PURPOSE: To study the effects of stride length alteration training on the electromyographic (EMG) activity of the quadriceps muscle group and hamstring muscle group and oxygen consumption.

METHODS: Eight male subjects were recruited for this study. Heart rate (HR), oxygen consumption (VO2), and EMG activity (quadriceps and hamstring) were measured during walking at self-selected speed at the following stride lengths: (1) self-selected (s-s), (2) 10% below s-s, (3) 20% below s-s, (4) 10% above s-s, (5) 20% above s-s, and (6) 30% above s-s stride-length. Subjects then trained 3 days per week for 8 weeks on a treadmill starting at 20% above their s-s speed. Each week, speed was increased by 0.1 miles per hour (mph) until the subject was unable to maintain a walking gait. Post-testing was conducted after the eight weeks. Repeated measures ANOVA were used to determine differences between sessions.

RESULTS: Post s-s speed, length, and VO2max were significantly higher than pre-test ($p=0.05$ for all). Both pre- and post- HR, VO2, and EMG activity were significantly lower at s-s stride length than all below and above s-s stride lengths ($p=0.05$ for all). Post- VO2 and EMG activity at s-s stride length were significantly higher than pre-test ($p=0.05$).

CONCLUSIONS: VO2 and EMG activity levels showed a U-shaped curve with the lowest at s-s stride lengths and higher at below and above s-s speed before and after 8 weeks of training. Training shifted the U-shaped curve for oxygen consumption and EMG to the right indicating increased walking energy cost that is related to increased s-s stride length.

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Fit For Fire: The tale of a year long partnering College and Service Community Engagement

Christina Day

ADVISOR Melanie Poudevigne | *Health and Fitness Management*

Fit for Fire is a Partnering Academics and Community Engagement (PACE) initiative allowing students to take what they are learning in their Health and Fitness Management classes and apply it in a real-world setting. The point of the initiative is to recondition firefighters who have become deconditioned due to a lack of physical requirement in the state of Georgia. Operations of Fit for Fire require student interns to receive and assess personal health information (PHI) for each fire fighter staff member to develop exercise prescriptions. Each fire staff member information is reviewed by supervising faculty prior to a pre-testing assessment for the fire fighter. Pre-testing is performed at the beginning of the semester to asses behavior change (BCG transtheoretical model), body composition (BC skinfolds, waist/hip ratio, circumferences), aerobic capacity (AC Bruce, step test), Balance (BL BESS), Agility (AG T-Test), muscular strength (MS handgrip), muscular endurance (ME push-up), leg press), and flexibility (FX seat-reach). Twice a week fire staff reports to the recreation center for a High Intensity Functional Training (HIFT) workout. If successful, this can create a standard for exercise prescription for fire fighters to allow them to maintain or reacquire their physical fitness that was obtained after graduating the fire academy.

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A New Way of Learning: Benefit of Adding P.A.C.E to an Abnormal Psychology Course

Cierra Chaney, Billie Escobar

ADVISOR Charlie Harris | *Psychology*

Partnering Academics and Community Engagement (PACE) was introduced in 2014 as a part of the University Enhancement Plan. This program combines curriculum with community-based engagement. In traditional instructional formats, students learn through didactic lectures, readings and class activities that facilitate content mastery. PACE courses allow students to apply course material at their community site and use knowledge gained from their applied experience to meet course objectives. Abnormal Psychology students partnered with a psychological services center, A Healing Paradigm, LLC, to develop a forensic interview to assist clinicians in diagnosing commonly encountered clinical disorders that were also covered in the course. Project leaders shadowed clinicians to gain insight on how to modify questions to avoid demand characteristics from influencing client responses and learned how clinicians conduct the structured interviews that were described in readings and covered in class.

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Evaluation of U.S. Preventative Services Taskforce Guideline: Depression Screening in Adults

Tanyetta Brown, William Gregory, Matilda Nju
ADVISOR Grace Nteff | *Nursing*

Depression is a common disorder that affects an individual's quality of life, and impairs daily functioning. Research shows that depression is among the leading cause of suicide and disability in persons 15 years and older (World Health Organization, 2019). Because suicide rates have increased exponentially over the last 20 years (American Foundation for Suicide Prevention, 2019), researchers and medical professionals are continuously formulating and updating clinical practice guidelines for screening purposes. Clinical practice guidelines are systematically developed statements used by practitioners to help guide decisions about appropriate healthcare for specific clinical conditions. The clinical practice guideline chosen for this project is the U.S. Preventative Services Task Force's recommendation for screening for depression in the adult population. Clinical Guidelines are reviewed by an interdisciplinary team, and revised as appropriate, to meet the ever-changing medical practice needs. The purpose of this project was to evaluate USPSTF's depression screening clinical practice guideline, apply the AGREE II Tool to the clinical practice guideline and finally analyze the results from the AGREE II tool. This rigorous evaluation revealed that this is a valid tool for the assessment and diagnosis of depression. Treatment recommendations for this disorder are vague and inadequate due to a lack of first-line treatments for depressive symptoms. Overall, we would recommend this clinical practice guideline, but with some modifications.

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Clinical Practice Guideline Review: The ISDLA 2018 Update on Diagnosis, Treatment, Chemoprophylaxis, and Institutional Outbreak Management of Seasonal Influenza

Adam Bomar, Kereene Wint, Brittany Miller
ADVISOR Grace Nteff | *Nursing*

This project explores the Clinical Practice Guidelines by the Infectious Disease Society of America: 2018 Update on Diagnosis, Treatment, Chemoprophylaxis and Institutional Outbreak Management of Seasonal Influenza. The guideline was analyzed using the Appraisal of Guidelines for Research and Evaluation II (AGREE TOOL II). The guideline was reviewed and analyzed for its purpose, clarity, appropriateness and how it applies to the adult population in outpatient settings. The project examines key areas such as stakeholder involvement, rigor of development, clarity, applicability and editorial independence. Overall, the group members agreed that the guideline was clinically relevant and valid for the adult population in outpatient primary settings.

Menopause Clinical Practice Guideline

Dallas Louis, Monica Bugg, Monique Joseph, Nimota Akintoye
ADVISOR Grace Nteff | *Nursing*

The purpose of this project was to analyze the 2011 Medical Guidelines for Clinical Practice for the Diagnosis and Treatment of Menopause put forth by the American Association of Clinical Endocrinologist. The guideline was independently evaluated using the Appraisal of Guidelines for Research and Evaluation (AGREE TOOL II). The guideline was reviewed and analyzed for quality and appropriateness for perimenopausal and menopausal women. The appraisal tool yielded the guideline's strengths in key areas, which included: scope and purpose, stakeholder involvement, rigour of development, applicability, and editorial independence. Although there was variability in the reviewers scores, the consensus of the reviewers agreed the guidelines were relavent and recommended for use in perimenopausal and postmenopausal women in the outpatient care setting.

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Evaluation of the 2018 USPSTF Cervical Cancer Screening Guideline

Kenya Corbitt, Yanique Lewis, Tamika Brown, Nikkita Saunders
ADVISOR Grace Nteff | *Nursing*

The purpose of this presentation is to evaluate the use of cervical cancer screening recommendations from the U.S. Preventative Services Task Force (USPSTF) in clinical practice. Human papillomavirus is the causative agent for cervical cancer development (Rerucha, Caro, and Wheeler, 2018). HPV types 16 and 18 account for 70% of cervical cancer cases. Screening tests for cervical cancer include cytology, HPV testing, and cotesting. The U.S. Preventative Services Task Force recommends cervical cancer screening should be initiated at 21 years old for women (U.S. Preventative Services Task Force, 2018). Women ages 21 to 29 should be screened every three years with cytology alone. Women ages 30 to 65 should be screened every three years with cytology alone, every five years for high risk HPV testing alone, or every five years with both cytology and high-risk HPV testing. The AGREE II instrument was utilized to assess the quality of U.S. Preventative Services Task Force cervical cancer screening guidelines (AGREE Next Steps Consortium, 2017). Following meticulous review of the USPSTF guidelines in conjunction with the AGREE II instrument, there was sufficient evidence to support the use of USPSTF cervical cancer screening guidelines in clinical practice. Overall, implementing USPSTF recommendations in clinical practice will further decrease the morbidity and mortality rates associated with cervical cancer.

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Evaluation of the Eighth Joint National Committee (JNC 8) Guideline on the Management of Hypertension

Jessica Matthewson, Kenyatta Collins, Carly Thamer

ADVISOR Grace Nteff | *Nursing*

The purpose of this presentation is to explore the efficacy of the guidelines from the Eighth Joint National Committee (JNC 8) on the management of hypertension in the adult population. It provides recommendations for elevated blood pressure in the adult population and factors that may influence patient outcomes. To effectively evaluate JNC 8, the Appraisal of Guidelines for Research and Evaluation II (AGREE II) tool was utilized by the group members to provide a thorough breakdown of the guideline. Each group member independently scored the six domains, and the scores were used to determine the quality of the evidence. After scoring the domains on a one-to-seven scoring system, with a score of one representing strongly disagree and a score of seven representing strongly agree, group members concluded that the JNC 8 guideline scores a five out of seven, indicating that we would each incorporate this guideline into our nurse practitioner practice.

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Study of Serotonin Adsorption at Glassy Carbon Electrode

Alexis Quainter

ADVISOR Augustine Agyeman | *Chemistry and Physics*

In this research, the adsorption properties and interfacial behavior of serotonin (5H-T) was investigated. Serotonin was analyzed at glassy carbon electrodes coated with a thin film of Standard Wyoming (SWy-2) through the use of cyclic voltammetry (CV). Calibration curve exhibits a linear range between 0.0010 mM amd 0.10 mM. Conditions such as adsorptive accumulation, effects of pH, and effects of scan rate, are still under investigation. Selective detection of 5H-T in the presence of other neurotransmitters is also being studied.

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Electrochemical Behavior and Adsorption Study of L-Norepinephrine

Rae Adams

ADVISOR Augustine Agyeman | *Chemistry and Physics*

Cyclic voltammetry was used to study the electrochemical behavior of norepinephrine, (NEP): C8H11NO3. The interfacial behavior and adsorption properties of NEP and its oxidation and reduction products were analyzed by varying the effects of scan rate, pH, and concentration on adsorption. A similar analysis was performed using clay-modified electrodes from the Standard Wyoming Montmorillonite (SWy-2) Clay. The detection limits for this compound were determined to be 5uL to 300 uL.

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Investigation of Vinculin from *Monosiga Brevicollis* in Respect to Multicellularity

Linda Ibarra Almodovar

ADVISOR Richard Singiser | *Chemistry and Physics*

Multicellularity occurs with the aid of cellular adhesion molecules - linkages between cell-cell and cell-extracellular matrix interactions. Cellular adhesions arise with the assembly of cytoskeletal actin-binding proteins- talin and vinculin. Vinculin is a crucial regulator of cellular adhesions by interconnecting talin and actin. Vinculin is composed of a globular head linked to a tail domain by a proline-rich region; the open conformation of vinculin directs the ligand-binding sites in the protein to other cells performing distinctive functions. Due to vinculin's vital involvement in cellular adhesions, it could be hypothesized that vinculin may have played a fundamental role in the origin of multicellularity. In light of this, the eukaryotic choanoflagellate model organism, *Monosiga brevicollis*, will be used to analyze vinculin's involvements in cellular adhesions. *Monosiga brevicollis* is an ideal model organism because it has a significant free-living single-celled stage and can also form colonies. Adhesion roles of vinculin in *M. brevicollis* will be assessed by mutating key amino acids to examine how a loss or gain of function affects vinculin's adhesion capacity. Considering the importance of vinculin in stabilizing cellular adhesions can provide a deeper understanding of various protein functions which contribute to principles of multicellularity. Ultimately, vinculin's adhesion activity relating to multicellularity may contribute to the progression of diseases involving cytoskeletal proteins and cellular movement.

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Metal-Organic Frameworks in the Inorganic Chemistry Teaching Lab: An Experiential Learning Activity

Tiffany Barker

ADVISOR John Meyers | *Chemistry and Physics*

Described herein is an internship course for undergraduate chemistry majors that provided experiential learning in experimental design for the undergraduate inorganic chemistry laboratory. A primary literature search was conducted to determine a cross-disciplinary topic with practical applications that could be sufficiently examined within two four-hour laboratory meetings. Metal-organic frameworks (MOFs) were chosen as the focus due to their versatility, customizability, and ease of preparation. Four articles selected from the literature served as the basis for the following experiment designed to explore the synthesis and applications of three different MOFs. First, a Î³-cyclodextrin MOF was synthesized. The ability of this MOF to adsorb 1) a simulated pollutant from solution and 2) CO2 gas was gauged using UV-Vis spectroscopy or gravimetric analysis. Next, the host-guest chemistry of the magnesium bisformate MOF, Î±-Mg3(O2CH)6, was studied with 1H NMR spectroscopy by examining the uptake of five different solvents. Lastly, a polypropylene bottle was employed as a reaction vessel to synthesize Co3(BTC)2Â·12H2O, and the structural changes associated with dehydration were assessed using gravimetric analysis and infrared spectroscopy. A lab manual, post-laboratory assessment, and grading rubric were created to be used by the course instructor. For each experiment, already published synthetic procedures were practiced and then slightly modified to match current inventory and time constraints. Additionally, waste management as well as good laboratory practices were discussed.

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Developing a Biofuels utilizing Cellobiase from Mushrooms

D'Ante Jolly

ADVISOR Fran Norflus | *Biology*

Glucose is the major energy source in many biological organisms, as such, has the capabilities to act as natural fuel source for our modern needs. Glucose can be obtained from the breakdown of cellulose which is something most animals generally can't do efficiently or at all. However, bacteria have enzymes that allow them breakdown cellulose into glucose. Glucose can then be converted into ethanol, a useable energy source, through fermentation. This presentation covers the research done to create biological fuel by converting cellobiase into glucose. The experiment utilizes the enzyme cellobiase, which was obtained from Shitake mushrooms, and p-Nitrophenyl glucopyranoside as a substrate. The reaction together results in p-Nitrophenol, which can be tested quantitatively, and glucose which we assume based on concentration of p-Nitrophenol. The research aims to optimize the amount of glucose produced by testing the efficiency of Shitake mushroom in producing optimum amounts of cellobiase based on the amount substrate, P-Nitrophenyl glucopyranoside. After said research, the next step is to test this on organisms with high amounts of cellulose such as plants, and eventually move onto converting glucose into ethanol.

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Investigating SET-17 and SET-30 as Potential H3K4 Lysine Methyltransferases in Meiotic Germ Cells of *C. elegans*

Marie Durr

ADVISOR Jewels Morgan | *Biology*

The DNA in eukaryotic cells is able to fit into the nucleus by being packaged, along with proteins known as histones, into chromatin. There are 4 histone proteins, H2A, H2B, H3 and H4 that each have two copies to form an octameric structure called a nucleosome. Each of these histones has an N-terminal tail that can be post-translationally modified causing a change in DNA packaging, thus helping to control gene expression. Epigenetic mechanisms can either activate or repress the expression of DNA with the addition of chemical groups such as methylation. In the nematode *C. elegans*, WDR-5 is a protein that exists in a conserved complex with lysine methyltransferases (KMTs) which cause the addition of methyl groups to the 4th lysine of histone 3 (H3K4me) in groups of one (H3K4me), two (H3K4me2), or three (H3K4me3). H3K4me2/3 by WDR-5 is associated with the activation of transcription for genes relating to development. In wdr-5 knockout worms, there is reduced H3K4me2/3 in the germline stem cells of the ovary, however H3K4me2/3 is still seen in the meiotic germ cells. The current investigation is to identify the KMT responsible for the H3K4me2/3 observed in the meiotic chromatin. The KMTs candidates thought to be involved are SET-17 and/or SET-30 which may be acting individually or cooperatively. We therefore analyzed single and double mutants in set-17 and set-30, first by performing a brood size analysis to see the effects of individual and combined gene knockouts on fertility of the worms. Immunofluorescence is also performed in order to image the amount of H3K4me2/3 in the meiotic region. If set-17/set-30 are involved, then little to no H3K4 methylation should be seen in the meiotic region. If these proteins are not the KMTs involved, then the amount of H3K4me2/3 present will be comparable to that of the wildtypes H3K4me2/3.

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Analysis of mutant prodigiosin PigC and its effect on antimicrobial properties and growth rate.

Jordan Daniel

ADVISOR Michelle Furlong | *Biology*

Prodigiosin is a red pigment that is produced in *Serratia marcescens* when it is grown at an ideal temperature of 25ËšC. The prodigiosin pathway is bifurcated and involves over 20 enzymes. One branch of the pathway converts pyruvate to 2-methyl-3-n-amyl-pyrrole (MAP) and the other branch converts proline to 4-methoxy-2,2'-bipyrrole-5-carbaldehyde (MBC). The enzyme PigC catalyzes the condensation reaction between MAP and MBC to create prodigiosin. UV light has the ability to mutate the DNA and alter the expression color by the prodigiosin, which in turn can alter other properties the bacteria possesses. Spread plates of *S. marcescens* were exposed to UV light for 10, 20, and 30 seconds to obtain mutants that produced less pigment or a different color entirely. Through this method, a white mutant and three other mutants were created and tested to confirm that they were in fact *S. marcescens*. Using two other *S. marcescens* mutation strains, 933 and WCF, with known mutations in the MBC and MAP branches of the pathway respectively, they were line streaked next to our white mutant using a "feeding" protocol described in the literature (Williamson et al. 2005) to determine the approximate location of the mutation within the pathway. Our results showed that the mutation was most likely in the PigC gene. A PCR was run on the white mutant's PigC gene and compared to the normal PigC gene using BLAST. Other things that prodigiosin can affect is antimicrobial properties and growth rate. To assess whether the mutation impacted antimicrobial abilities, the *S. marcescens* wild type and mutants were tested against *Escherichia coli*, *Pseudomonas aeruginosa*, and *Staphylococcus aureus* to determine if the zones of inhibition were affected. To assess whether growth rates of the mutants were impacted by the mutation growth, curves of the mutant strains were compared to the wild-type strains.

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The presence of beneficial symbionts increases metabolic rates and methane release in cockroaches

Julia Saucedo

ADVISOR Miguel Reyes | *Biology*

Beneficial symbionts play a crucial role in various biological processes. Cockroaches provide a prime model system to study metabolism and host-symbiont dynamics. In our research, we studied the effect of beneficial bacteria on metabolism using Central American cockroaches (*Blaberus discoidalis*). Experimental cockroach populations were placed in one of three dietary treatments: The control, which had an unaltered flora; The probiotic, which allowed roaches to establish symbiont populations; The antibiotic, which suppressed all symbionts. This allowed us to measure the interaction between presence/absence of beneficial symbionts with metabolism. We used the Q-Box RP1LP Low Range Respirometer to measure the ratio between oxygen, carbon dioxide and methane gases. The measurement of methane further allowed us to connect our study with a common greenhouse gas. As predicted, the cockroaches given a diet with probiotics showed higher levels of metabolism, which may be due to the energy needed for harboring beneficial symbionts. Furthermore, higher levels of methane released was also associated with the presence of symbionts. Overall our study suggests that cockroaches harboring symbionts have higher energy needs.

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Seasonal Patterns in Plankton Abundance and Species Composition in a Small Pond in Morrow, GA

Jenny Thieu, Larissa Richey

ADVISOR Ann Showalter | *Biology*

Despite their size, small ponds play an important ecological role by housing a diverse community of species. In the pelagic, open-water areas of ponds, phytoplankton form the base of the food web and are consumed by zooplankton. Zooplankton are important food sources for fish and other aquatic predators. The abundance and species composition of phytoplankton and zooplankton depend on several environmental factors such as temperature, light availability, nutrient levels, and predation intensity, which fluctuate seasonally. In this study, we observed the seasonal patterns of abundance in phytoplankton and zooplankton found in a pond at Reynold's Nature Preserve in Morrow, GA. Phytoplankton abundance was quantified by measuring the concentration of chlorophyll in biweekly water samples. We identified and counted crustacean and rotifer zooplankton and estimated their biomass using published length-weight regression equations. We found that during the beginning of summer, rotifer biomass and diversity was at its highest. This was soon followed by a peak in copepods abundance, which feed on rotifers. Cladocerans biomass and diversity was generally low but tended to increase over the growing season. We expect chlorophyll concentrations to fluctuate with the changes in zooplankton biomass. Our study suggests that phytoplankton and zooplankton diversity in Reynold's Nature Preserve is affected by seasonal shifts in environmental conditions. We hope to compare these results to historic data from this pond to understand how shifts in climate and land use might affect small ponds.

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Locations and Pitting on Eastern Box Turtles

Jordan Bryant

ADVISOR Diane Day | *Biology*

From 2008 through 2018, Eastern box turtles (*Terrapene carolina*) have been studied at a site in Fayetteville, Ga. It was noted that there were varying degrees of pitting on the shells of the turtles and the pitting was becoming more frequent. The pitting on the turtles ranged from no pitting, to moderate, to extreme. Some of the pitting is so severe that it is down to the bone or large holes expose the limbs to predators. Each time a turtle was encountered, its global positioning system coordinates (GPS) were recorded. Twenty-one turtles with extreme pitting were selected and mapped out using the GPS coordinates on the program ArcGIS. Correlations between turtles with and without pitting are being looked at and studied to help determine the cause and seriousness of pitting and what factors could be influencing the pitting. Data results show that there is a concentration of pitting found in two locations at the research site.

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Gallai-Ramsey Numbers for Rainbow Paths

Noah Watts, Pierre Besse
ADVISOR Colton Magnant | *Mathematics*

Given graphs G and H and a positive integer k, the Gallai-Ramsey number is defined to be the minimum integer n such that every coloring of the complete graph on n vertices using at most k colors will contain either a rainbow copy of G or a monochromatic copy of H. We consider this question in the cases where G=P4 and G=P5.

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Multivariate Analysis using Audio Recognition and Machine Learning

Ryan Vessell, Brian Walton, Melanie Cannon, Ngan Nguyen
ADVISOR Scott Bailey | *Mathematics*

The purpose of the MATH4800 research project is to assist the National Nevada Security Site (NNSS) in developing an effective statistical process in identifying the occurrences of an event in a sensor's data. Our approach is to use audio recognition technologies along with machine learning to classify and detect events based on their audiological "fingerprint". The Merlyn sensor data, we were provided, is in the form of WAV files. By using Python, we are working to combine and visually evaluate the appropriate audio files to identify event instances. This is done through a concept called "fingerprinting". The first step is creating a spectrogram of the data which graphically illustrates a 3-D depiction of amplitude in accordance to an x-axis of time and a y-axis of frequency. This is done to locate points of the highest peaks of amplitude in the files. Because attenuation causes the reduction of a signal's amplitude, the highest amplitudes will be the least affected and therefore easier to identify. Next, a map of these points is created based off their location in the spectrogram. This can be ran against spectrograms of different audio files to see if an occurrence of the map happens anywhere else. If it does, the occurrence will identify another instance of an event.

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Data Visualization

Nguyen Kim
ADVISOR Angkul Kongmunvattana | *Information Technology*

Visualization is a visual encoding of information for communication. Many aspects of visualization pipeline feature events of a probabilistic nature, bearing a striking resemblance to a communication pipeline. Our goal is providing multiple types of visualization for better communication. While viewing and understanding pictures are natural to human, understanding numerical data takes years of training, and even then, many people are still deficient at interpreting numerical data. It is easier to find trends and relations from a well-drawn picture because visual presentation of data takes advantage of a vast capacity of human's eyes to detect information from illustrations. With JavaScript and various libraries, we create a Web Application that accepts data through an upload. The application processes data and renders its graphical representation. Users can view their data in live mode with different angles, enabling a better representation of data with visually pleasing illustrations.

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Diversity of Restaurants in Las Vegas through Visual Analytics with Gephi

Denzell Moss, Michael Hollis, Carry Manivanh
ADVISOR Angkul Kongmunvattana | *Computer Science*

Las Vegas is one of the largest tourist sites in America and in the World. With a high volume of visitors from different cultural backgrounds in the city every single day, it is expected that the restaurant industries in the city area have become more diverse, featuring many types of cuisine. Using dataset from Yelp, we were able to curate all restaurants located in Las Vegas and pinpoint their specific categories, such as Mexican cuisine, Fast-food based establishments, etc. After converting, cleaning, refining, storing, and extracting the data using Python code, OpenRefine software, SQLite database, and database query statements, we were able to visualize them using Gephi, showing the interrelated categories and traits of restaurants. The visualization highlights the diversity of restaurants through the mixture of colors between each data point.

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Mathematical Foundations of Sanger's Concurrent DNA Sequencing

Alina Ageichik
ADVISOR Colton Magnant | *Mathematics*

We propose a mathematical algorithm for sequencing of multiple DNA strands (fragments) concurrently and implement a prototype function that uses this algorithm to generate a realistic visual representation of a sequenced DNA fragment. Our model considers factors like background noise, a concentration of DNA that influences the process of DNA sequencing. Under certain conditions, our model allows concurrent sequencing of two unique DNA strands.

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PepsiCo's Innovative Mindset and its Impact on its Supply Chain

Brian Sims, Marvin Thompson, Gina Rodriguez
ADVISOR Carin Lightner-Laws | *Supply Chain Management*

This presentation is intended to show how PepsiCo is continuously improving and innovating on its products as well as itself. The presentation will present the company's history. The presentation will show how a company's culture, technology, and inside and outside influences can impact or further innovation. Examples will be provided of such innovations and their impact upon consumers, the market, and the world. Also, the presentation will provide a look at PepsiCo's future with examples of new market strategies, new products and so forth.

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Johnson & Johnson: Challenges in a Global Supply Chain Landscape

Mason Henry, Dennis Mikko, Anthony Hunter
ADVISOR Carin Lightner-Laws | *Supply Chain Management*

Johnson & Johnson is one of the largest and most successful brands in fields from medical supplies to cosmetics a as well as chemicals and cleaners. One of the main focuses in their business strategy is to grow to be a truly global brand and have a presence in every country and market in the world. They have found many challenges such as different cultural norms to changing laws in food and drug safety in not just one but many countries and districts which has led to difficulty in maintain their current supply network.

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The Impact of Technological Innovations at Nestle

Omolola James, Ana Cortes, Stephen Ukiwo
ADVISOR Carin Lightner-Laws | *Supply Chain Management*

With innovations in the technological world every day, Nestle has found various ways to better manage their warehouses with the production being bought in and sent out, as well partnering with companies to build warehouses that handle their consumer goods properly and test prototypes of new technological equipment that is made.
New innovations are being made everyday and for a company like Nestle, there has been positive and negative effects. The business world is evolving with technology in just about every aspect of a business whether that be R&D, warehousing, or manufacturing. Making changes is not the easiest thing to do especially in such a big company as is Nestle, but it is often necessary to stay in the competition. Very interesting things are in the works for Nestle such as new products, collaboration with XPO, R&D center in China, and much more.

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Samsung's corporate social responsibility and ethics impact on supply chains

Ramon Frost, Daisy Bustamante, Bryce Dawson
ADVISOR Carin Lightner-Laws | *General Business*

Samsung is a south Korean multinational company that is headquartered in Samsung Town, Seoul. Besides just making phones Samsung has stuck their hand into many other in devours such as home appliances, and televisions, just to name a few. With Samsung being such a large multi-billion-dollar company, they must abide by rules dealing with manufacturing and distributing out their products. So, with this project my group members and I plan to discuss Samsung's corporate social responsibility and ethics that impact their supply chain.

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Intel & Conflict-Free Resources

Terence Long, Christopher Brown, David Ector
ADVISOR Carin Lightner-Laws | *General Business*

The purpose of this report is to examine Intel's use of conflict-free resources and their efforts in corporate social responsibility. Our team used various academic and online research to study how Intel's ethical decisions impact their supply chain. We have found that according to Intel's research, militias and rebel groups in eastern Congo have used the funds from the sale of minerals such as tungsten and tantalum to participate in conflicts that have killed over 5 million people since 1998. By making an effort to use conflict free resources Intel would provide greater opportunities to people living in countries impacted by conflicts.

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POSTER PRESENTATIONS

Graphing Calculators In The Classroom

Jae Parker

ADVISOR Kelli Nipper | *Mathematics*

Graphing calculators have been used in the mathematics classroom for speed, to leap hurdles, to make connections among representations, and to permit realism through the use of authentic data. The use of calculators has been a topic of discussion since its introduction inside the classroom. On both sides of the discussion, studies have been performed yet no concrete results have been established to determine one way or the other. One side of the discussion is on the use of calculators enabling students rather than increasing their mathematic abilities. The other side believes that the use of calculators help by speeding the calculating process thus the teacher can focus on the lessons.

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Development of an Animal Physiology Lab Examining Heart Potentials

K'Swissheonna Sloan

ADVISOR Barbara Musolf | *Biology*

As an intern, I helped my mentor develop and trouble shoot labs studying electrical activity of the heart using BioPac equipment and software. We initially developed two different labs studying electrocardiograms (ECGs). To prepare students for the lab I wrote questions that were added to a D2L quiz. Following a successful introduction to ECGs in the Spring 2019 Animal Physiology class we then studied electrical activity of the crayfish heart and experimented with the effects of different hormones on crayfish heart activity.

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The Development and Implementation of a Computational and Experimental Brownian Motion Study in an Undergraduate Physics Course

Tommy Stell, Linh Nguyen, Linda Ibarra, Tiffany Barker, Raynise Adams, Jasmine Harris, Carlos Martinez, Tatiana Krivosheev

ADVISOR Tatiana Krivosheev | *Chemistry and Physics*

This project was a determination of the effectiveness of including an experiment in Brownian motion in an undergraduate physics course. An experiment in Brownian motion would allow undergraduates an introduction to statistical physics which is a staple of thermodynamics and quantum mechanics. The experiment was accomplished through the use of both physical and computational methods. Polystyrene microspheres suspended in water were tracked through microscopes and the computational portion was modeled through the use of Jupyter notebooks. Furthermore, this experiment was implemented in an undergraduate physics lab and evaluated for as a permanent addition to the undergraduate course.

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The effect of learning assistant involvement on student exam performance

Moriah Milner, Delia Dimaculangan, Anthony Dawson, Jenny Thieu, Manoly Baquerizo, Chase Dunbar, Patrick Foster

ADVISORS Barbara Musolf & Ann Showalter | *Biology*

One of the challenges of education is ensuring that students are able to learn the material with sufficient involvement. To overcome this issue, peer learning is used because it increases the efficiency of the students' higher-order cognitive skills (Sellami et al. 2017). The learning assistant (LA) program differs from other forms of peer teaching in that the LAs are well versed in implementing pedagogical and metacognitive skills, which can be used when helping students in and outside of the lab. In this study, we assessed how weekly quizzes and the number of visits with an LA could affect the exam scores of students in introductory biology lab classes. Quizzes were made by the LAs and reviewed by two graders. Test scores were analyzed for the midterm and final exam. Preliminary results suggest that administering quizzes and visiting LAs to review assignments does not have a significant impact on student performance on subsequent lab assignments and exams.

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Decolonizing the Curriculum

Tyra Robinson, Ebony Davis
ADVISOR Eckart Werther | *Psychology*

This poster will review the psychological impact that a Eurocentric curriculum has on college students of color by highlighting how the mono-culturalism in higher education affects the mental and psychological health and academic achievement of non-white student populations in the education system. This poster will highlight the relationship between structural modes of racism and how that affects the opportunity or achievement gap for minorities. When the curriculum in higher education centers on Eurocentric standards as the moral and intellectual norm of the world, a deeply imbedded structure of institutionalized racism is created. To understand why such an institution of racism has become normalized and hardly ever questioned or challenged in society, this poster will examine recent studies which have shown that the overall achievement gap in higher education among non-minorities students have, on average, been higher than various other ethnic groups. In analyzing the role the monocultural curriculum plays on these statistics, this poster will also elaborate on why there should be an urgency to correct the current curriculum so that all minorities not only have equal opportunity, but also equal representation and achievement.

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Development of an Investigative Method for a General Chemistry Laboratory Course on Local Stream Health.

Carlos Martinez, Kelly Jackson
ADVISOR Aubrey Dyer | *Chemistry and Physics*

This project involved the development of a guided inquiry experiment for a first semester general chemistry laboratory course for science majors. A procedure for testing of dissolved O_2 and pH on standard samples was developed and tested. In addition a scale-up of recommended protocols for testing dissolved oxygen and pH on local stream samples was developed for the general chemistry laboratory. The project also explored the feasibility of on-site testing of local streams for several sections of a general chemistry laboratory course.

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A Student's Dilemma - Game Theory, Rational Choice, & The Prisoner's Dilemma Game.

Sasha Benefield

ADVISOR Joshua Meddaugh | *Social Sciences*

The poster presentation will introduce the concepts of economic game theory, rational choice, and the prisoner's dilemma game in single and repeated games.

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Surveillance Camera with Raspberry Pi

Jeremy Weed, Phung Vy Luu, Scotty Rodriguez

ADVISOR Shakil Akhtar | *Information Technology*

In this project, IoT home security is examined in depth and either a prototype or working demonstration of an IoT home security device is presented. The research team chose to create a home surveillance system using a Raspberry Pi, Camera Pi, and supporting software or code. This project could be furthered by adding sensors for motion tracking. The Pi Camera attaches to the Raspberry Pi via camera port in the Pi, and the software for the camera installs on the Raspbian operating System. Then using IBM Bluemix and Node-Red, the system is coded to pass captured photos and videos to a web server for live and remote viewing. In addition, users will have a control center to login and then select the appropriate camera. For security, the website will encrypt the user’s account information such as usernames and passwords, storing them in a PostgreSQL database.

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Truss the I-Beams

Roosevon Lee, Kenneth Callahan, Lauren Castellon, Paola Arce-Villa, Pho Truong

ADVISOR Tatiana Krivosheev | *Chemistry and Physics*

The ultimate purpose of our project is to build a truss using I-beam pieces. To execute this plan, all beams will be joined together by brackets, and the brackets will be secured by screws. The internal forces (such as tension and compression) which develop in individual members will be analyzed theoretically and measured carefully by applying various loads to different members in the design.

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The Baltimore Truss

Siradio Bah, Stella Nantale, Evan Ortiz, Austin Donnell
ADVISOR Tatiana Krivosheev | *Chemistry and Physics*

In this project we design the Baltimore truss bridge. The Baltimore truss is a subclass of the Pratt truss with additional members located in its lower section. The additional members help prevent buckling in the compression members and to control deflection. Baltimore trusses are popular for train bridges. As part of this project, we determine the importance of the additional braces, find the tensile and compressive forces of the members using different loads. We also determine the maximum weight the bridge can hold and how incremental weights affect tension and compression members.

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Analysis of the Pennsylvania Petit Truss

Toby Schipper, Jacob Foster, Kendall Wilhelm, Nthabiseng Carlisle
ADVISOR Tatiana Krivosheev | *Chemistry and Physics*

Our purpose is to build a Pennsylvania petit truss out of wood with the goal of calculating the maximum amount of load the truss can withstanding. We will be using sand to apply weight to the truss in order to test our calculations. The Pennsylvania Truss is modeled after the Parker Truss, except it uses sub-struts and sub-ties. The sub-members are used to stiffen the truss for heavier, moving loads. An example of where this truss is used is for railroad freight trains.

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Bats: Nature's Sonar

Humza Naqvi
ADVISOR Stephen Burnett | *Biology*

Bats generate ultrasonic calls and detect and analyze the echoes to help them locate and capture food as well as to detect objects such as trees and buildings. This process, called echolocation, is similar to technologies of radar and sonar. These echolocation calls differ by species and by purpose: whether the bat is merely searching for prey or approaching prey about to be captured. I recorded bat calls in a variety of locations around Atlanta using an ultrasound microphone and an analog to digital converter ADC). Individual bat calls were extracted using custom software. Analysis of these calls was performed using custom software that generates a spectrogram (which visualizes frequency content of a signal over time) and determines key parameters of each call. Comparison of extracted calls was used to determine which species of bat were detected. My prediction is that there will be a difference in species detected based on what kind of environment is observed.

Static Friction

Jared Schaeffer, Michael Rumph, Godwynn Fontanilla, Pierre Besse

ADVISOR Tatiana Krivosheev | *Chemistry and Physics*

Friction is the resistive force of one object tending to move relative to another. In this experiment, we measure the coefficient of static friction. Static friction is the force that keeps an object at rest. Once this is force is overcome, the object will begin to move. We will find the coefficient of static friction by having a mass m1 on various types of sloped surfaces. Mass m1 is connected to another mass m2. The objective is to find the mass m2 at which the system is in equilibrium to find the static friction coefficient for each surface.

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The Discovery of the Electron Through a Series of Experiments in Physical Chemistry

Rae Adams, Tiffany Barker, Jasmine Harris, Landon Clemens, Ashlei Johnson, Veni Khamphavanh, Davis Luu, Carlos Martinez, Gueu Oulai, Thomas Stell

ADVISOR Tatiana Krivosheev | *Chemistry and Physics*

The goal of this project is to recreate two milestones in the history for the discovery of an electron: Millikan's Oil Drop experiment and J.J. Thomson’s e/m experiment. This project started with Millikan’s famous oil drop experiment, in which the small charged oil drops moving inside of an electric field can be used to measure the charge of an electron. An atomizer sprays a light mist of oil into the electric field where the oil droplets interact with free electrons produced by a radiation source, giving the oil droplets a small charge. The oil droplets’ motion can be adjusted by changing the strength and the direction of the electric field. By measuring how fast the droplet travels through the grid within the apparatus, the electric charge of the droplet we followed was calculated to be 5.77 10-18 C, which corresponds to 36 electrons. Next was J.J. Thomson’s e/m experiment which consisted of an electron moving along a circular path when introduced into an electromagnetic field. The radius of the circle can be adjusted by altering the electric and magnetic fields. Through these adjustments, the specific charge to mass ratio of an electron was determined to be 1.7551 1011 C/kg. In the future, we want to recreate the galvanic electrolysis cell experiment which first indicated the existence of the natural unit of electricity, known as the electron.

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A Study on Pond Microoganisms

Gardy Victor
ADVISOR Stephen Burnett | *Biology*

Aquatic ecosystems contain a large and diverse population of microorganism. These microorganisms interact in many different ways sometimes being involved in symbiotic relationships, as well as commensal and predatory relationships with other microorganism. In this study, multiple aquatic microorganism will be collected from different environments to record and observe species-specific physiology and behavior. Then, we will test to see if any new interactions develop upon placing these organisms in the same environment. We also want to observe any potential changes to behavior and physiology in response to changes in environment. Gaining an understanding of these interactions will enhance our knowledge on how the interactions between different organisms affect their roles to the environment.

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Investigation Of the Treatment of Local Stream and Lake Water With a Potassium Aluminum Sulfate Flocculant for Purification

Kelly R Jackson, Carlos Martinez, Aubrey Dyer
ADVISOR Aubrey Dyer | *Chemistry and Physics*

Alum (potassium aluminum sulfate) is commonly employed as a flocculant to improve water clarity and for purification. This project explored the treatment of local water sources (stream and lake) with Alum as an experiment to be utilized in a first semester general chemistry guided inquiry laboratory. The synthesis of Alum is based on a laboratory experiment in which Alum is prepared from recycled aluminum soda cans, demonstrating sustainability. Factors for water quality initially tested included total dissolved solids and conductivity. The water samples were tested before and after treatment and compared to standard laboratory samples.

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Inhibition of *Pseudomonas aeruginosa* Using Synergistic Antibiotics

Amy Passmore
ADVISOR Renee McFarlane | *Biology*

Pseudomonas aeruginosa is a gram-negative bacteria found in a variety of common environments including water and soil. It is an most commonly an opportunistic pathogen, usually only causing infection in individuals with compromised immune systems. However, *P. aeruginosa* is a major cause of hospital acquired infections (HAIs). In critical care settings, up to 67% of HAIs are attributed to this bacteria. Increased antibiotic resistance has resulted in great difficulty treating these infections. One of the main factors contributing to the bacteria's antibiotic resistance is its capability of biofilm formation. Biofilms contribute to resistance in ways that remain not well understood. Current treatment of these infections utilizes combinations of antibiotics to work synergistically against the bacteria's multiple resistance mechanisms. For this experiment, we will be testing the synergistic effect of two antibiotics to determine if their combined effects lead to decreased formation of *P. aeruginosa* biofilm.

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Inhibition of *Streptococcus mutans* via various naturally sourced therapies.

Kacey Wallace
ADVISOR Renee McFarlane | *Biology*

Current statistical evidence demonstrates that the prevalence of caries disease in the United States is remarkably high with 91% of U.S. adults 20-64 years old experiencing dental caries disease process. The most commonly occurring oral disease is dental caries. *Streptococcus mutans* is a gram positive, facultative anaerobic bacterium that has been identified as a prominent contributor to the caries disease process. The ability of *S. mutans* to create biofilm and colonize the mouth are key functions contributing to its pathogenicity. The continued development of biofilm results in the deterioration of the hydroxyapatite surface layer of tooth enamel causing depressions in the tooth structure which serve as niches for further bacterial proliferation and also support the development of plaques and onset of decay which contributes to the exposure of subsurface dentin, cementum and pulp structures of the tooth. The research conducted in this experiment seeks to describe the ability of naturally sourced remedies to inhibit *Streptococcus mutans*. Data identified in this experiment may be used to highlight avenues of interest to homeopathic medicine and the economically challenged portion of the general public in an effort to curtail the burden of this disease in populations in across the globe.

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Ladybugs show adaptive behavior in predation when exposed to distinct habitat temperatures

Karen Morales

ADVISOR Miguel Reyes | *Biology*

In agriculture, pea aphids (*Acyrthosiphon pisum*) are considered a pest and are responsible for substantial loss in crops. One potential way to control pea aphid populations is through the use of ladybugs (*Hippodamia convergens*), which act as natural predators. Furthermore, climatic shifts are continuously influencing the crop ecosystems. In this experiment, we explored the impact of temperature shifts in prey-predator dynamics between ladybugs and pea aphids. Experimental ladybug populations were exposed to gradual temperature increases in treatment groups of 22 C, 26 C and 30 C, thus we assessed the effect of temperature shifts in predation behavior. We also studied predation choice behavior, by measuring which aphid instar stage was most preferred by ladybugs within a ten minute timeframe. Contrary to our predictions, temperature changes do not impact predation behavior in ladybugs, suggesting that ladybugs are able to adapt and show similar levels of predation across variable temperatures.

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Autism Spectrum Disorder in Infancy: Early Indicators, Screening, and Intervention

Kiet Pham

ADVISOR Deborah Deckner-Davis | *Psychology*

Autism spectrum disorder (ASD) is a neurodevelopmental disorder defined by qualitatively impaired language, behavioral, communication, and social development. The ultimate goal of this paper is to demystify this multifaceted and heterogeneous disorder by conducting an extensive literature review. It has been confirmed that the early detection of ASD is associated with better, more promising life outcomes. For this reason, the literature being reviewed is focused on the early years of life (i.e., birth to 3 or 4 years of age). This paper presents currently known, early indicators of ASD, be they biological or behavioral; emphasis is placed on the latter. Viable early screening and diagnosing methods and/or tools will be described, followed by the introduction of early intervention models and/or techniques. Finally, the paper discusses the reason why early screening and early intervention are important, as well as how early detection of ASD can be challenging.

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The Mental and Emotional Benefits of Volunteering

Markie Barnett

ADVISOR Eckart Werther | *Psychology*

This poster will review literature on the mental and emotional benefits of volunteering to draw a conclusion on if volunteering can help those with mental illness. Mental and emotional health is becoming a topic of discussion among the world. Approximately 43.8 million adults in the United States experiences mental illness in a given year and 21.4% of youth (aged 13-18) experiences a severe mental disorder at some point during their life. There is a lack of treatment and help that can be given to certain individuals, whether the lack comes from cost, not enough clinics, or not have the resources or knowledge to get help. One simple thing, such as volunteering, has been known to have a positive effect on social psychological factors, decrease the risk of depression, increase a sense of purpose and fulfillment, and reduce stress levels.

This topic matters because living a healthy, happy life is important and people should be educated on ways that can positively affect them. If volunteering has a positive outcome on the volunteers and those that they serve, then we are one step closer to helping those with mental illness and creating a better world.

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Music as Therapy: Everything Old is New Again

Diana Justice

ADVISOR Annalisa Chang | *Visual and Performing Arts*

This paper is about the historical context of music therapy. Music was always considered a powerful tool to alter the human spirit. From the Greeks to the composers of the Baroque, the effects of music have been known and used to inspire and treat illnesses. Music therapy as a profession started in World War I with the “song physician” and continued to advance through World War II. Eventually, music therapy became an official profession choice with specific training and education required for practicing professionals. Today, music therapy is a thriving profession that continues to grow in research and methods.

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Superwoman Schema and Authenticity: The Burden of Keepin' it Real?

Crystal Butler, Charlie Harris, Brian Goldman, Pinar Gurkas
ADVISOR Pinar Gurkas | *Psychology*

The Superwoman Schema (SWS) is a theoretical framework pertaining to the "Strong Black Woman" construct. It suggests that African-American women internalize culturally socialized schemas that influence role-functioning. The SWS is comprised of five different dimensions; obligation to manifest strength, obligation to suppress emotions, resistance to being vulnerable/dependent, intense motivation to succeed, and obligation to help others (Woods-Giscombe, 2010). The SWS has both perceived benefits and liabilities for this population as the conceptualization of these beliefs are reflected in various dimensions of the lives of these women. Authentic functioning is defined by the expression of one's true self in one's day-to-day functioning. It is comprised of four components; awareness, unbiased processing, behavior, and relational orientation (Kernis & Goldman, 2006). This current study focuses on the behavioral aspect of authenticity, exploring whether an empirical link exists between behavioral authenticity and SWS. To our knowledge, no previous studies explore this link. We hypothesized that greater internalization of SWS would be associated with actions that are less expressive of one's true self. Results revealed that behavioral authenticity was significantly negatively correlated with three of the five SWS subscales: obligation to suppress emotions, resistance to being vulnerable, and obligation to help others. In line with our hypothesis, the more internalized SWS are, the more women reported living in ways that are not in line with the expression of their true selves. The findings have both theoretical and clinical implications when it comes to potential consequences of African-American women internalizing the SWS. Perhaps when adhering to cultural expectations in role functioning, SWS may cause cognitive dissonance that could lead to negative appraisals of their own functioning, greater stress, and suppression of the full expression of one's true self. Future research should explore additional factors influencing the challenges faced by African-American women in negotiating their identities.

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Wellness Programming and Counseling Outcomes for a Predominant African American Workforce

Anthony Patton Jr., Dru Boyles, Alexis Scott, Dr. Eckart Werther

ADVISOR Eckart Werther | *Psychology*

The current study analyzed Outcome Questionnaire 45 (OQ-45; Lambert et al., 2004). Data were obtained from a sample of municipal employees from a large metropolitan city located in the southeastern United States. Our study analysis outcome data from the counseling and wellness programming offered by an internal Employee Assistance Program (EAP). The employee population for this setting is predominantly African American. This setting provides short-term individual and couples counseling, psychoeducational seminars, group counseling, crises response, and assessment & referral services. Outcome Questionnaire 45 (OQ-45; Lambert et al., 2004) Mental health difficulties are not uncommon amongst the working population in the US (LaMontagne et., al 2014). Neglecting the mental health needs amongst the working population contributes to increased absenteeism, short- and long-term disability claims, higher rates of turnover, increased sick-leave usage, reduced productivity, and heightened health care expenditures (Dimoff and Kelloway, 2013, Cavanaugh, 2014). African Americans tend to avoid mental health services due to various factors such as: stigma, expense/cost, unawareness of the symptoms, negative perceptions, and the lack of cultural sensitivity amongst mental health professional (Thompson, Bazile, & Akbar 2004). The current study explored for changes in self-reported symptomatology and aims to provide a counter narrative to the often-negative experiences reported by many persons of color when they access mental health services

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Assessing Reliability and Validity of the OQ-45 Among an African American Sample

Crystal Butler, Hailey Budd, Kaleigh Cleghorn, Eckart Werther

ADVISOR Eckart Werther | *Psychology*

The proposed poster presentation examines the reliability/validity of The Outcome Questionnaire-45 (OQ-45) with an African-American sample. The OQ-45 is a 45-item self-report measure designed to track/measure client progress in psychotherapy/counseling. It is used in a variety of clinical settings and designed to be repeatedly administered. The OQ-45 measures three constructs: Symptom Distress, Interpersonal Relations, and Social Role performance (Beckstead et al., 2003). This study analyzed OQ-45 data obtained from an African-American municipal employee sample receiving mental health services at an internal Employee Assistance Program. The 'employer' in this study was a large urban city in the southeastern US. The measure was completed as a normal aspect of clinical operations at the EAP. African-Americans tend to underutilize mental health services (Williamson, 2014). Studies have shown that as little as 10.1 percent of African-Americans/Black-Caribbeans utilize these services (Neighbors et al., 2007). This is due in part to beliefs held by some African-Americans that mental health problems are not medical problems, and due to stigma, fear of judgement, and lack of knowledge about the therapy process (Williamson, 2014). African-Americans are also underrepresented in the standardization/norming of research (Scharff et al., 2010). Many African-Americans feel mistrust toward research. The Tuskegee syphilis study, in which participants were mistreated and deceived, is one study recognized as a reason that African Americans feel this mistrust. The fall-out of this deception had a huge impact on human-subjects review and approval processes (Scharff et al., 2010). This mistrust and lack of participation are why African-Americans are still underrepresented in the standardization/norming of research. Studies like these are important for many reasons as in increasing the reliability and validity of measures like the OQ-45. Having an accurate representation of the African-American population will allow for a better sense of reliability when comparing data from other ethnic groups.

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Analysis of municipal employees mental health and potential implications for internal Employee Assistance Programs

Marcus Minko

ADVISOR Eckart Werther | *Psychology*

Mental health difficulties are not uncommon in the work place (LaMontagne et., al 2014). In fact, poor employee mental health has been associated with increased absenteeism, short-and-long-term disability claims, higher rates of turnover, sick-leave usage, reduced productivity, and heightened health care expenditures (Dimoff and Kelloway, 2013,Cavanaugh, 2014). Research suggests that Employee Assistance Programs (EAP) are instrumental in assisting with a wide range of issues that impact both personal well-being and job performance. (Krivda and Tucker, 2014).

This poster presentation will present data on employees' self-reported levels of personal and interpersonal stress-related difficulties as measured by the Outcome Questionnaire-45 (OQ-45). The participants in the study are municipal employees of a major urban center in the southeastern US. . This organization, and others of a similar structure, consists of several departments within the same institution. The nature of the work performed within certain departments varies significantly in comparison to other areas of the organization. Analysis will be conducted in order to see if individuals working within certain areas of the institution demonstrate greater need for an Employee Assistance Program.

This investigation could begin to clarify which types of employees within similar organizations might benefit most from Employee Assistance Programs. An organization may benefit from directed efforts to increase awareness and utilization of an available EAP for those most in need of such care. The result could be a healthier, more efficient, more effective, and overall higher functioning workforce

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Does exposure to the Confederate Flag affect emotions? It depends on how authentic you are.

Dominique Jones, Marcus Minko
ADVISOR Brian Goldman | *Psychology*

In the current study, the researchers looked at how people's emotions may be altered by being shown either a Confederate or an Olympic flag. We also looked at how psychological authenticity may play a role in influencing negatively felt emotions in reaction to the flag that they were shown. Authenticity is defined as the degree to which one's true self is expressed in one's day-to-day functioning. Participants first completed self-report scales on authenticity and affect (i.e. present emotional state) before being exposed to a picture of a room that included either the Confederate or Olympic flag on a laptop screen embedded within the room. The affect scale was given once again post-stimulus (i.e. flag exposure). The findings indicated that more negative emotions (e.g. useless, ashamed, fearful) were reported when people who are low in authenticity were shown the Confederate flag. By contrast, people who were high in authenticity who were shown the Confederate flag reported having the least amount of negative emotions. Such findings suggest that how authentic people are may be consequential in influencing how people react to potentially threatening stimuli.

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Dancing in November: Presidential Party Seat Loss in Midterm Elections.

Jordan Knight, Joshua Meddaugh
ADVISOR Joshua Meddaugh | *Social Sciences*

The loss of House seats of the president's party during midterm elections is one of the rare laws of political science. If the president serves longer than four years, the party evaluations become negative, accounting for the increased loss of the president's party House seats in the midterm of his second term (Abramowitz, Cover, & Norpoth, 1986). Therefore, the midterm becomes a major obstacle to the success of president's party agenda as the president can count on fewer votes to pass the party's policies. Understanding that voter turnout is already lower during midterm elections (A. Campbell 1960; J. Campbell 1987), we ask do the parties use the initiative process to increase voter turnout during midterm elections of a president's second term to spur voter turnout to thwart the loss of seats for their party in Congress, subsequently increasing the likelihood of success for the party's agenda.

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When Exposed to the Confederate Flag, How Does your Attachment Style Affect your Ethnocultural Empathy Towards Others?

Norman Godoy, Asia Brown, Shantini Francis

ADVISOR Pearl Chang | *Psychology*

How does your upbringing influence your acceptance of other races? Does your acceptance change when your see a threatening symbol such as the Confederate flag? This study explores the different relationship patterns individuals have with others concerning the negative historical representation of the Confederate flag and positive influence of the Olympic flag. 194 Clayton State University students were exposed to either the Confederate (experimental group) or Olympic flag (control group). Participants were initially informed this was a memory recall study, to provide a plausible reason to be shown a picture of a room that included either a Confederate or Olympic flag in it. Based on archival data, the intent of this project was to measure how attachment styles and ethnocultural empathy are related and whether or not those relationships change based on the exposure to either flag. Regression analysis was conducted to determine the impact of attachment styles and flag exposure on individualsâ€™ levels of ethnocultural empathy. Findings regarding this project will be discussed in addition to future directions and limitations of the study.

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Antigone (Mask Making)

Tony Fernandez, Derrick Vanmeter

ADVISOR Derrick Vanmeter | *Visual and Performing Arts*

This presentation is going to consist of the process and construction of the Masks that were designed and constructed with the use of thermoplastics.

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