SESSION 1
Education
Social Sciences

SESSION 2
Life Sciences, Physical Sciences, Mathematics, & Water

SESSION 3
Business
Computer Science, MIS, Cybersecurity, & Statistics
Health Sciences

SESSION 4
Arts & Humanities
Engineering, Transportation, & Energy
Abstract:

Art therapy is a growing field and the more research that is published, the more we see of its many benefits to society. This study examined the literature that combines art and reminiscence therapy to treat patients with mild cognitive impairment, Alzheimer's, or other dementia. The goal is to explore whether the treatment improves their quality of life overall. A majority of the studies show that both therapies improve quality of life and provide the patients with the opportunity to feel less burdened or frustrated because of their cognitive impairments. Some studies have even shown improvement in apathetic traits in patients with Alzheimer's. Moreover, studies support meaningful activity engagement as an alternative to pharmaceutical treatment.

There can be many implications such as behavioral treatment options for patients and, potentially, better quality of life and less frustration or burden on caregivers' daily lives. This study is a systematic review of the literature about this topic from the years 1995-2017, creating almost a 25-year study of the literature. The keywords "art therapy", "reminiscence", "dementia", and "Alzheimer's" were used to search PsychInfo, PsychAricles, PubMed, ERIC, CINAHL, and Cochrane Database of systematic Reviews for relevant literature. The first author identified potential articles from the title and then read abstracts for inclusion. The other involved researchers also read the abstracts to establish inter-rater reliability.
Abstract:

As people grow older, health declines and many adults develop health problems they have never faced before (CDC, 2018). People may deal with these changes in different ways, implementing both active and passive coping strategies to deal with new health issues (Snow-Tureka, Norrisa, & Tan, 1995). Active coping can be defined as taking direct action to alleviate a problem (Carver, Scheier, & Weintraub, 1989), while passive coping is characterized by helplessness or reliance on others for health management (Nicholas et al., 1992). Past research has demonstrated that maladaptive coping behaviors such as those that define passive coping may lead to worsened subjective health (Hill & Kennedy 2002). While passive coping may have detrimental effects on subjective health, forms of active coping such as positive-cognitive coping correlate with increases in subjective health (Lohr et al., 1988). The present study seeks to expand upon past research by exploring the specific moderating effects of active and passive coping in the relationship between objective and subjective health in adults clinically diagnosed with Osteoarthritis.

Data was collected as part of The Alabama Research Institute on Aging's EQUAL project. The subjective health and objective health conditions checklist (Multilevel Assessment Instrument; Lawton et al., 1982) assessed participant subjective and objective health, while the COPE Inventory (Carver, Scheier, & Weintraub, 1989) assessed active and passive coping strategies used by participants. Linear regressions will address the relationship between objective and subjective health as well as the moderating effects of active and passive coping.
Abstract:

With increasing tuition costs and living expenses, college students undergo a massive financial burden in order to obtain their degree. The issue of extremely high costs for textbooks in addition to these other financial responsibilities has become very prevalent. According to a Koch (2006), the rise of textbook prices in combination with a 7% average annual increase in tuition and fees, has caused the cost of attending college to skyrocket year by year. According to Carbaugh and Ghosh’s study (2005) on the fairness of textbook prices, students have yearly textbook bills of $800-$900. Students, parents, professors, book publishers, and many other populations within the United States are affected by this problem of textbook costs and obtaining more data would increase public knowledge and awareness of this issue. As college students, we the researchers are affected by this issue first-hand. Collecting and analyzing more data would give us more insight into this issue.

The purpose of this specific study is to collect information from University of Alabama students regarding their thoughts, feelings, and opinions regarding college textbook prices. We set out two answer two questions related to college students and textbooks. The first being what are students’ thoughts/feelings regarding college textbooks in general and the second being how much are students spending on textbooks per semester at The University of Alabama?

Both quantitative and qualitative methods were used. Quantitative data came from the online survey, and qualitative data came from the focus groups and various open-ended questions included in the online survey. Through the use of focus groups, we could record the individual, personal experience and were able to supplement this qualitative data with the quantitative data collected. Field notes were taken from each focus group.

Results suggest that students at The University of Alabama typically spend $301-$500 on textbooks per semester. This means that an approximate total cost of $602-$1,000 in textbook spending is added to the students’ financial responsibilities per year, adding up to an additional $2,408-$4,000 if students spend four years at the University. This is relatively similar to the average cost Carbaugh and Ghosh came up in 2005 ($800-$900 per year), meaning that this textbook price issue has not been resolved or changed in twelve years. With a total cost of $24,804 for in-state students and $42,124 for out-of-state students for tuition and fee plus room and board per year at The University of Alabama, the additional financial burden of textbooks brings the cost of higher education at the capstone as well as many other universities up significantly. Additionally, students at The University of Alabama have an overwhelmingly negative view of college textbooks and their prices. Textbook usage discussed within the focus groups represented a mutual feeling of students not using textbooks enough to justify the price of them. Overall, students specifically at The University of Alabama feel they are paying too much each semester for their textbooks. There are no ethical concerns in this study.
Student Presenter: Samantha Anderson
Title: An Examination of Facebook Communication among Chronically Ill Adolescents and Their Best Friends for Themes of Positive and Negative Affect and Support

Abstract:

Not Publishable
Student Presenter: Emily Barnett  
Title: Narcissists and Interest in Learning Accurate Information About the Self  

Abstract:  
Not Publishable
Student Presenter: Emily Barnett, Alex Liveoak, Madisen Reece, Kellie Walsh,
Title: What did I get myself into?: Reasons for assisting intoxicated peers and outcomes of helping behavior

Abstract:
The prevalence of risky or problematic substance use is high on college campuses. As a result, "bystander intervention programs" have been put in place to support the well-being of college students. These programs encourage students to help keep their intoxicated peers safe from the many dangers of alcohol and other substances. The purpose of this study was to evaluate why college students assist their intoxicated peers and to determine the positive and negative consequence of their helping behavior and whether the consequences have implications for assisting in the future. The participants of this study consisted of students from a public university in the southeastern United States who provided their opinions about why they helped their intoxicated peers and the repercussions from it. Results have implications for proper campus outreach programming related to alcohol use.
Student Presenter: Zoe Berndt, Henry Pitts, Peyton Badura
Title: The Beautification and Revitalization of Marion, Alabama

Abstract:
Not Publishable
Student Presenter: Zoe Bieler
Title: The Effects of a Pre-Kindergarten Student's Primary Language on their Behavioral, Social and Emotional Performances

Abstract:

Justification: Pre-Kindergarten (4-year-old) classrooms are being included in public schools and there is a need to examine if public funds are adequately preparing children for school.

Purpose: The purpose of the study was to evaluate whether the primary language spoken at home impacted Pre-K age children's social-emotional development, behavior, and performance in the classroom.

Method: 24 Pre-K teachers across 11 elementary schools completed a Tuscaloosa Area Kindergarten Readiness Assessment questionnaire on 393 Pre-K children (4-year-olds) in their care.

Results: The data collected showed many differences in the social-emotional development of children speaking English, Spanish, Chinese and Arabic. Students speaking primarily English scored higher than the other language speakers in identifying their gender, knowing their first and last names, knowing their parent's first and last names, being able to say their own age, being able to express own needs in a way understandable to adults and peers and being able to ask for help when needed. Interestingly, children whose primary language was Spanish scored higher in being able to play/work in a group, share, take turns, use self-control, spontaneously pick up objects other children dropped or showing a willingness to help, and being able to suppress being impulsive or overreacting. In addition, primarily Chinese speaking students scored higher in being easily frustrated or irritated, followed by Spanish speaking students, with English speaking students scoring after both of those. The data showed many behavioral patterns of students speaking different primary languages. English speaking children scored highest in communicating about themselves and their needs, whereas Spanish speaking 4-year-olds scored higher than other children in social skills, including interacting with peers and in self-regulation.

Conclusion: The results show English speaking students show better communication skills whereas Spanish speaking children showed greater emotional maturity.
Abstract:

Introduction: Sleep is a restorative and active process that humans need to survive. Insufficient sleep (short sleep duration) is associated with poor psychological and physical health outcomes. About 65% of adolescents obtain less than the recommended amount of sleep per night, which is approximately 9 hours. Insufficient sleep in adolescents is associated with poor cognitive functioning, depressed mood, and poor long-term health consequences. Several factors relate to insufficient sleep in adolescents including school-start times, parenting style, and familial relationships. However, less is known about the parent-adolescent relationship and how it relates to sleep. Parenting style can provide interpersonal security for adolescents, which is necessary for quality sleep. Decreased interpersonal security between the parent and adolescent could increase adolescent arousal, which is counterproductive to sleep. One way to characterize the parent-adolescent relationship is by measuring the adolescent’s attachment style to his or her parents. Attachment style is based on Attachment Theory which was developed by John Bowlby in 1966. Conversely, anxious and avoidant attachment occurs when there is decreased security in the relationship. Another way to characterize the parent adolescent relationship is by assessing the frequency and intensity of conflict. This study will examine how attachment style and conflict in the parent-adolescent relationship influence adolescent sleep. Few studies have examined the association between the parent-adolescent relationship and adolescent sleep, particularly in young adolescents (10-14 years old), who are more vulnerable to consequences of insufficient sleep.

Methods: This study was conducted at the University of Pittsburgh in Pennsylvania. Thirty parent-adolescent dyads participated over a 10-day time period. Adolescents were 58% male and 12.2 years of age (SD = 1.5). Attachment was measured through the Experiences in Close Relationship scale, which measures anxious and avoidant attachment. Conflict was measured using the Parental Environment Questionnaire. Adolescents wore actigraphy watches to measure their sleep and completed daily sleep diaries. Actigraphy watches are a way to measure sleep-wake cycles. This analysis will include adolescent data only. Future analyses will include correlations between attachment style and conflict and adolescent sleep duration. Descriptives analyses were conducted to determine the means and standard deviations of independent and dependent variables.

Results: Average sleep duration over the 10-day time period was 479.93 minutes, which is just under 8 hours of sleep, and below the recommendation of 9 hours of sleep per night. Conflict between mother and adolescent has a mean of 21.13 (SD= 4.95). Conflict between father and adolescent has a mean of 20.2142 (SD= 6.33). Means anxious attachment was 1.955 (SD = 0.87) while avoidance has a mean of 3.2401 (SD= 0.39).

Conclusion: This study will allow researchers to understand how the parent-adolescent relationship and family environment directly influence adolescent sleep. Adolescence is characterized as a time period of intense change and quality sleep is vital during this time. It is important to see how these factors influence adolescent sleep, because while sleep need does not change, but adolescents often obtain insufficient sleep.
Student Presenter: Nicholas Boehm
Title: Affective Reactions to Online Social Comparison in Vulnerable and Grandiose Narcissists

Abstract:
This study examines the susceptibility of grandiose and vulnerable narcissists to affective changes when engaging in social comparison online. It is hypothesized that vulnerable narcissists will have a negative affective response to both upward and neutral comparison, while having a decreased negative response to downward comparison. We also hypothesized that grandiose narcissists to react positively to both downward and neutral comparison, while having no significant affective reaction to upward comparison. A sample of 250 college students will be randomly assigned one of three different Facebook profiles, designed to invoke upward, neutral, and downward comparison. We expect grandiose narcissism to predict increases in positive affect and decreased negative affect when engaging in downward and neutral comparison, with no affective reaction to upward comparison. We also expect that vulnerable narcissists will respond with increased negative and decreased positive affect to upward and neutral comparison, and decreased negative affect to downward comparison. These findings would support the notion that vulnerable narcissists are more sensitive to social comparison and are thus more likely to respond with depressed and anxious affect when engaging in upward and neutral comparison. However, grandiose narcissists' insensitivity to upward comparison would cause them to dismiss the threat typically experienced by the normal population.
Abstract:

Memory is the ability to encode, store, and retrieve information, which is critical for everyday functioning including learning, adhering to medication, and sharing life experiences with others. One specific context in which memory is key is when learning a foreign language. While children acquire new languages relatively quickly and easily, learning a new language as an adult is quite difficult. This process requires the binding of known information (words in one's native language) with novel information (words in the new language), which is believed to rely on a network of brain regions that span the frontal cortex, temporal cortex, and parietal cortex. Thus, research is needed to both understand how adult language learning occurs and how to facilitate this process. Most studies investigating the neural correlates of novel language acquisition use correlational techniques like EEG or fMRI. However, because these techniques are correlational, it is not clear whether the brain regions implicated in those studies are necessary for encoding, storing, and/or retrieving foreign language words. A non-invasive procedure called Transcranial Direct Current Stimulation (tDCS) uses anodal (positive) and cathodal (negative) electrodes to send low-intensity electrical currents through regions of the brain, modulating brain activity. The present study aims to use this technique to gain causal inference as to which brain regions are involved in foreign language learning and, in the process, learn how to improve language acquisition. This study includes three phases that each take place 24 hours apart. The first two sessions are study phases, during which participants receive 20 minutes of stimulation, and are then given 73 English-Swahili word pairs to study over a period of 20 minutes. Swahili was chosen to minimize the effects of prior exposure or acquisition of a known foreign language. On the third day, participants are tested on their retention using cued-recall, where the Swahili word is provided and participants type the English equivalent. One week later, participants will take the memory test again to account for long-term retention. The tDCS is administered at one of three placement sites using the International 10-20 system for EEG electrode placement: F3, which is involved with sustain attention and verbal episodic memory retrieval, P3, which contains the Angular Gyrus, a region that is involved with many processes related to language, and T3, a site that includes Wernicke's Area, which plays a role in reading comprehension, word recognition, and long-term memory. We hypothesize that, overall, participants who receive anodal tDCS will have higher retention levels than those who receive sham stimulation (a brief 30 second stimulation that will control for possible placebo effects). We will analyze the results using a 3 (Brain Region) x 2 (Stimulation Type) ANOVA with 10 participants per condition. We expect that a comparison of the different groups will shed light on the main cognitive processes and physiological areas of the brain involved with learning a new language as an adult.
Abstract:

From childhood to early adulthood, interest in STEM (science, technology, engineering, and mathematics) careers falls off more quickly for females than males and women with STEM academic skills are less likely to pursue a STEM career than their male counterparts. Some researchers have suggested that women leave STEM fields before graduating because they do not feel as if they belong both generally and in their major. This study compared 354 STEM majors (122 female, 232 male) at The University of Alabama. Surveys were given in courses generally required for STEM majors and included measures of belonging on campus, belonging in major, confidence in general, confidence in STEM ability, academic adjustment, and support from friends and faculty. Statistical comparisons were made between men and women who were STEM majors in these courses. Results indicated that women felt a greater sense of belonging in their major than men, and generally scored higher in questions reflecting academic adjustment. They did not differ from men in their reported support from faculty and friends. Nevertheless, men scored higher than women in their confidence STEM abilities. These findings do not support the hypothesis that women in STEM majors feel alienated in their STEM courses. Possible explanations for the findings are discussed.
Abstract:
In an era where women in leadership and innovation positions is applauded and encouraged, I was expecting to find a significant number of women in corporate leadership when compared to previous years. We wanted to see what role women in leadership played in the success of IPO's. The purpose of this research was to gain understanding on the personnel working behind each company that went public in 2017. Continuing Dr. Welbourne's ongoing research on IPOs, I collected data on each IPO issued in 2017. To collect this data, I used prospectuses issued by each company. Beginning at the start of the spring 2018 semester, data such as number of women in leadership of the IPOs, gender of CEO, and industry was collected. Our research is ongoing, so far 72 out of the 143 IPOs issued in 2017 have been coded. Previous literature on the topic, including Dr. Welbourne's previous research work, reveals that while having women listed in management positions in the prospectus may correlate to a lower initial stock price, it positively impacts company health and a higher stock price later in the company's life.
Student Presenter: Lena Brysacz, Savannah Stewart, Anna Lee Cook, Harper Singleton,
Title: Grant Writing for Marion Alabama

Abstract:

Not Publishable
Abstract:

For this research project, I observed a student in the first grade who is in a self-contained classroom for severe behavior problems. His name is Isaac and he comes from an unstable home where he is not in any contact with neither of his parents. His behavior strongly affects his ability to function in the general education classroom. The goal for him being in this classroom is to help him learn how to manage his behavior in and outside of school, with the hopes of returning to the general education classroom. I observed and collected data on this student for 5 days and noticed that he likes to leave the classroom without any adult permission. During the 5 days of data collection, I noticed the function of his behavior was to gain attention from the teacher when she was focused on the other students, escape the classroom when there was major chaos, or get away from any kind of activities that require group work. Next, I came up with an intervention that would disrupt his "leaving the classroom" behavior. I chose to give the student positive attention by using consistent praise throughout the day, especially when I suspected possible triggers. I implemented this intervention for 12 days and collected data. The intervention helped the student manage and become more aware of his unacceptable behavior. By the end of the twelve days, there was a significant decrease in the amount of times that the student left the classroom.
Abstract:

Justification: Approximately 12 million women in the United States experience clinical levels of depression each year; contributing factors include biological components (e.g., hormonal, reproductive, and genetic), but also social factors (e.g., roles and expectations; National Institute of Mental Health, 1999). Compared to heterosexual individuals, sexual minorities experience a higher rate of depression, seemingly due to the interplay of discrimination and intolerance (Logie, Lacombe-Duncan, Poteat, & Wagner, 2017). Additionally, for female sexual-minorities, sexual orientation may be a risk factor that is highly misunderstood in developing depressive symptoms, and the effects of clinical depression on relationship quality. Using the theory of social exchange, which considers the exchange of rewards and costs between partners, I expect a negative correlation between depression and levels of patient and partner intimacy, as depression is a perceived cost.

Objective: The objective of the study was to test the correlation between depression and perceived relationship intimacy in women in same-sex relationships. To do so I looked at the association between patient depression and patient intimacy as well as patient depression and partner intimacy.

Methods: Participants are being recruited nation-wide through posted advertisements in a variety of venues (e.g., mental health organizations, LGBTQ Organizations, medical offices, Facebook advertisements, universities, etc.). Interested participants contact the research assistant (RA) to establish interest and eligibility. To meet eligibility requirements, the participants must be at least eighteen years old, in a female same-sex partnership, both partners willing to participate, and one member of the same-sex female partnership must exhibit clinical levels of depressive symptoms, while the other partner can not. Eligible couples receive an exclusive ID and instructions on how to complete the baseline survey, containing the informed consent. Our intention is to obtain data from 100 female couples to examine patient’s depression and levels of intimacy outcomes for both dyad members.

Results: Currently, fourteen couples have completed surveys. Of those fourteen couples, one couple was removed based on lack of response regarding intimacy related questions. I assessed depression with 4 items from the Profile of Mood States scale (Shacham, 1983) using a scale of 1 ("not at all") to 5 ("extremely"). I averaged the 4 items to measure depression (m=3.45, SD=1.17). Likewise, I assessed intimacy with 3 items using the Perceived Relationship Quality Components Inventory scale (Fletcher, 2000) using a scale of 1 ("not at all") to 7 ("Extremely"). I summed the three items to measure intimacy for patients (m=17.00, SD=3.79) and for partners (m=17.54, SD=1.99). As expected, I found a negative correlation between patient depression and patient relationship intimacy (r=-.59, p=.03). However, the correlation between patient depression and partner relationship intimacy was not significant (r=-.28, p=.36).

Conclusions: This study shows that depressive symptoms are negatively associated with depressed individuals' relationship intimacy but not their partner's relationship intimacy. It may be important for female partnerships to be actively engaged in ways to alleviate stress and build relationship quality for the partner experiencing depressive symptoms.
Student Presenter: Sydney Burkhart
Title: Learning American Sign Language via Virtual Reality

Abstract:

This research in progress proposes the use of Virtual Reality (VR) headsets and gloves containing movement sensors to assist in the teaching of American Sign Language (ASL) to children and college students. The technology comprised of VR headsets and movement gloves will allow the system to recognize the production of ASL via hand movements and provide feedback related to the interaction between the user and the virtual reality environment. This innovative research proposes an experimental design to compare ASL learners using VR to those in a traditional face-to-face learning method for ASL. The goal of this study is to find if there is an increase in movement accuracy and retention using VR compared to traditional learning methods due to increases in a virtually mediated channel which augments movements into a digital space.
Abstract:

This study analyzes the No Child Left Behind Act of 2001 in terms of its effects on college readiness. The policy critique reviews the context by which No Child Left Behind was produced, and the intended outcomes in regards to college readiness. There is a need for greater understanding of what the effects of NCLB has been on college readiness. This will help aid the development of future educational policies intending on assisting students achieve in postsecondary education, as well as the potential for success of federal education policy. In studying the act, and data following the act, the study answers the question of how policy at the federal level can directly impact students. Central to the research, the study answers the question of whether or not students are more prepared for college today, and if this can be at least partly attributed to NCLB. This study examines US Congressional Records and other historical documents that help to better understand the intentions and compromises of NCLB. In addition, the study examines quantitative data collected by the US Department of Education such as high school graduation rates and dropout rates, as well as college enrollment rates and graduation rates from the time immediately before and after the act was enacted. Preliminary results suggest that the act did little in improving college readiness, especially for minority students.
Session 1: 8:30-10:00 | Education; Social Sciences
Category 2: Completed Work
Poster Number: 80

Student Presenter: John Denton
Title: Accept or Decline?: Deciding Factors in a Voluntary HIV Testing Program for Probationers and Parolees

Abstract:

Introduction: HIV in the United States is disproportionately present in the South, where mass incarceration of African-Americans and lack of sexual education programs worsen the epidemic. Those in correctional environments such as probation or parole programs are at even higher risk for infection, as they have newly-regained freedoms to engage in high-risk behavior while forgoing the mandatory HIV testing and education programs that are offered in Alabama prisons.

Purpose: My presentation will focus on the HIV education and testing needs of community-based offenders, and on my efforts to reduce the burden of HIV in this high-risk population. I will describe my role as an HIV education and testing champion at Tuscaloosa County's probation and parole office, where I conducted original research in an effort to improve knowledge about HIV testing uptake among correctional populations in Alabama.

Methods: I attended the county parole office on three HIV testing days per month over the summer of 2017 and the spring of 2018 (ongoing), performing the same role as HIV testing champion that students in the Sociology of HIV class at the University of Alabama had performed during the previous two semesters. The program offers a $10 gift card and bag of condoms for being tested, and I sought to determine if money was an incentive or if other factors played a role. After eliciting the reasons for people’s acceptances or refusals for being tested, I logged their responses, incorporated the responses and rates recorded by previous champions, categorized reasons by type, and analyzed the results according to their motivations and barriers to testing.

Results: Of the 2,276 offenders who reported for site visits during the data collection period, twenty-five percent (25%) volunteered to be tested. The most common reasons for getting a test included wanting to know one's HIV status (46.5%) and the $10 gift card (44.2%). Of the seventy-five percent (75%) of offenders who declined testing, common reasons were recently being tested for HIV (34.2%), not having enough time (20.9%), fear or distrust (11.8%) and a perception of not being at risk for HIV infection (9%). Notably, almost one-fourth (24.1%) of people who gave a refusal also refused to give a reason, responding instead by taking offense to the question, keeping silent or providing nothing beyond a firm, brief "no."

Conclusions: Considering the relative disadvantage of opt-in testing to opt-out testing, an intake rate of 25% indicates strong promise for ongoing HIV prevention efforts in populations under correctional supervision. To this point, there have been few studies that delve into reasons for HIV testing acceptances and refusals in correctional settings other wanting to know one's status, free testing and perceptions of risk. The strong response to the $10 gift card incentive suggests that opt-in testing in this environment requires a clear positive incentive to achieve acceptable intake rates. This study, which shows the interplay between statewide systems, local nonprofits, and Alabamians under correctional supervision, helps to set groundwork for future similar programs in correctional facilities across the US.
Abstract:

In 2013, the Alabama state legislature passed the Alabama Accountability Act (AAA), which provides scholarships to low-income families who choose to send their children to private schools. The goal of the AAA was to give families the ability to send their children to private schools who were currently zoned for low-performing schools; however, for the 2016-2017 school year, only one in three scholarship recipients were from "failing" schools. During the same year, over 100 private schools had students enrolled that utilized funds from the AAA. This study reviews how school administrators utilized AAA funds in their schools; specifically, the research looks to see if differences in fund utilization exist in rural private schools and urban private schools after receiving funds through the AAA. By interviewing school administrators from both types of schools and reviewing standardized test scores from before and after the passage of the AAA, the positive and negative effects from administrators' perspectives will be examined.
Session 1: 8:30-10:00 | Education; Social Sciences
Category 1: Work in Progress
Poster Number: 19

Student Presenter: Claire Estep
Title: Emergence of Third Spaces: Exploring Trans Student Campus Climate Perceptions within LGBTQ Collegiate Environments

Abstract:
Not Publishable
Abstract:

The human mind's capacity for creativity has been an object of study for many years, with specific interest given to our ability to amplify creative capabilities over long lengths of time. Research has been conducted on how having a resting stage known as an "incubation period," a period of rest in the middle of performing a creativity task, increases measures of creativity compared to no rest. However, there has not yet been any significant research conducted on the effects of an incubation period on performance on a creativity task in a group setting. The purpose of the current study is to test whether there is an incubation effect on groups of subjects rather than individual ones, and what effect(s) specific incubation tasks have on group creativity. Conducting research on creativity in a group setting is important because the capabilities of human creativity in this scenario better reflect real-world application of creativity rather than creativity in an individualistic sense. Our study tested 3 hypotheses: (1) that having an incubation period causes increased measures of creativity compared to not having a incubation period, (2) that measures of creativity will be larger when a separate cognitive task is giving during the incubation period rather than just resting, and (3), that cognitively higher-level incubation tasks will result in lower measures of creativity than lower-level tasks. Our subjects consisted of 25 dyads of students from the University of Alabama psychological subject pool for a total of 50 participants, ranging in age from 18-23 years of age, with 9 males and 41 females. Data from 5 of these subjects was discarded due to manipulation errors. To measure creativity, dyads worked on alternative uses tasks (AUT), where dyads work together to list alternative uses for everyday objects, for 3 minutes, underwent incubation for 2 minutes, and resumed working on the same item for 3 minutes. Four different incubation tasks were tested: (a) resting with no separate cognitive task, (b) a low-level cognitive task, (c) a high-level cognitive task, and (d) no incubation task or period (used as a control). Series of 2x4 and 2x2 repeated measures ANOVA were conducted to analyze the data and test the hypotheses. It was found that (1) incubation does increase group creativity compared to no incubation, (2) that measures of creativity are higher after some sort of cognitive task rather than no task during incubation, and (3) that there was no significant difference in creativity measures between high and low-cognitive tasks during incubation, confirming our first 2 hypotheses and disproving our third. Thus, the results of this study show a relationship between cognitive breaks between sessions of creativity, knowledge which can be applied to real-world institutions such as schools or businesses to develop techniques that can boost long-term creativity levels in their respective individuals, leading to increased and more efficient productivity.
Session 1: 8:30-10:00 | Education; Social Sciences
Category 1: Work in Progress
Poster Number: 5

Student Presenter: Anna Field
Title: Autism Spectrum Disorder Knowledge Among Rural and Urban Teachers in Alabama

Abstract:
Not Publishable
Abstract:

This research compares how males and females process different advertising cues presented in ad copy as predicted by the selectivity hypothesis. This research also includes an additional variable, need for cognition (NCOG). NCOG is a personality variable indicating how much the respondent likes to think, process and consider information presented to him/her. The experiment compares two ad treatments, one designed to be more appealing to females and another designed to be more appealing to males. The hypotheses predict that females will report significantly higher attitude-toward-the-ad, attitude-toward-the-brand and purchase intention scores when presented with the female-centric information. Males should respond significantly higher than females when presented with the male-centric treatment. A significant interaction effect will be observed among respondents reporting a high need for cognition.
Abstract:

As a great deal of attention in the press has recently highlighted, institutions of all kinds are experiencing provocative racial incidents that affect the wellbeing of their members as well as the those in the surrounding community. One area where this particularly seems to be the case is within the Greek system throughout universities nationwide. Although great strides have been made on these issues over the years, these incidents nonetheless highlight that such problems can persist, particularly when organizations and their leadership do not successfully try to instill a culture of responsible behaviors and inclusiveness or silently tolerate such behavior until a critical incident occurs. I believe the lack of personal accountability and outward attempts to foster a positive and inclusive culture makes such incidents more likely to occur, and unless work is done to try and combat this, could lead to the removal of these organizations altogether. My research aims to examine both the culture and leadership of Greek organizations on campus with the goal of determining not just where and why failures occur, but also to examine what institutions and leaders can do to actively develop character and moral awareness in their membership. Using survey-based field methodology, and quantitative regression-based analytical techniques, I will develop and test a longitudinal model to explain factors underlying this phenomenon in the fraternities and sororities at the University of Alabama. The ultimate goal for this project is the development of an empirically-derived training system which can be delivered annually to incoming members of Greek organizations with the goal of creating more inclusive social environments not just on our campus, but nationwide.
Student Presenter: Megan Friend, Zachary Ziegenhorn
Title: The Benefits of Interactive Media Programs within Schools

Abstract:

Not Publishable
Student Presenter: Alicia Gallo, Parker Renton, Blarie Taggart
Title: How to deal with your drunk roommate: College students' perceptions about the most and least helpful ways to assist intoxicated peers

Abstract:
College campuses use "bystander intervention programs" to help reduce the prevalence of risky or problematic substance use. Such programs encourage students to keep their classmates safe from alcohol poisoning, peer pressure, and a variety of dangerous outcomes related to substance use by actively intervening and offering assistance to them. The purpose of this study was to further examine bystander behavior among college students by investigating what students found to be most and least helpful when assisting intoxicated peers. The participants of this study consisted of students from a public university in the southeastern United States who provided their opinion about the most and least helpful ways to help keep peers safe in risky drinking situations. Results showed personal assistance (e.g., giving their peers food and water, watching peers throughout the night) as the most common response for helpful methods, while contacting authority and emergency responders to be the most common response for unhelpful methods. These results have implications for training emergency responders and other campus authority figures on effective ways to offer assistance to students when needed.
Abstract:

Psychopathy is a personality disorder involving manipulativeness, lack of empathy or guilt, impulsivity, and antisocial behavior. Recently, a distinction between types of empathy for specific emotions has been made and measured in psychopathy through physiological means. The proposed study would measure empathetic fear in men and women with psychopathic traits, in order to further our understanding of how psychopathy is expressed differently in men and women. A forensic sample of men and women at the Tuscaloosa County Jail will be assessed for psychopathic traits with the screening version of the Hare Psychopathy Checklist. They will then view images of others in distress, threatening images, and neutral images from the International Affective Picture System, as well as read a fear-inducing prompt, all with concurrent measurements of skin conductance response and heart rate. Skin conductance and heart rate will be measured using a wireless Galvanic Skin Response sensor (Shimmer3 GSR+ Unit), which transmits the data to a computer via Bluetooth. This sensor has been approved for use at the Tuscaloosa County Jail. We hypothesize that compared with participants low in psychopathic traits, participants high in psychopathic traits will show reduced physiological response to fear-inducing stimuli. Additionally, of those participants high in psychopathic traits, female participants with psychopathic traits, compared with their male counterparts, will show increased physiological responding to empathetic fear-inducing stimuli (distress images). This study will be the first to measure gender differences in physiological responding in a sample of men and women in the same study. Additionally, it will build on these findings by using skin conductance and heart rate to measure physiological responding (where the previous researchers had measured startle potentiation).
Abstract:

In 1987, the United States appealed to the United Nations to condemn Cuba for its "rampant human rights abuses", citing specifically the treatment of prisoners in Cuban prisons, particularly political prisoners. The United States argued that reports of the use of violence, solitary confinement, and inadequate supplies of food to punish uncooperative political prisoners in Cuban prisons as well as the use of labor camps and violence in the political re-education of these prisoners warranted strong condemnation and action by the United Nations.

Less than twenty years later, the United States began sending its own political prisoners to what has been described as one of the "worst prisons in the world", the U.S.'s military outpost at Guantánamo Bay in Cuba. Denial of due process legal rights, use of torture, and withholding of food and medical services at the prison has been well-documented but has continued due to the ambiguous situation the prison occupies in American law.

The United States' statements on Cuban prison conditions are seemingly incongruent with its actions in Guantánamo Bay, and underscore how the United States has used and continues to use human rights abuses more as a political tool than an object of genuine concern. The relationship between the United States and Cuba regarding Guantánamo and prison conditions exemplifies how imperial legacies have affected and continue to affect human rights, power dynamics between nations, and the individual lives of the people of those nations.
Student Presenter: Kennedy George
Title: Parent Sense of Satisfaction and Efficacy before an after a Parent Mediated Autism Intervention

Abstract:

Justification: Parents of children with Autism Spectrum Disorder (ASD) face many challenges. One of these challenges is how to best communicate with their child. Project ImPACT (Ingersoll & Dvortcsak, 2010) is a family centered therapy program that is focused on improving communication, social interaction, imitation, and play in children at risk for autism spectrum disorder. The hallmark of project ImPACT is that the parents and children accomplish these goals together in a parent-mediated intervention. This approach makes the parents the lead teachers of communication with their child.

Purpose: Previous studies have reported finding lower stress levels in parents who participated in a parent mediated style intervention approach (Estes 2013). We propose that beyond stress, a parent centered intervention will result in improved sense of competence among participating parents. In this study, we gathered pre-and post-testing data to observe if the parents' views of their own efficacy and satisfaction had changed after being part of the 12 week Project ImPACT intervention and whether parental age contributed to these dimensions.

Method: During Project ImPACT intervention, parents are taught a series of techniques to improve their child's social communication skills within a developmental context.

A general demographic scale and The Parent Sense of Competence Scale (PSOC; Gibaud-Wallston & Wandersman, 1978) was distributed to each family involved in project ImPACT at the beginning and end of the 12-week period. The scale is a 15-item self-report questionnaire designed to measure the degree of efficacy and satisfaction to which parents feel in parenting their children.

Results: In the initial analysis, we saw that efficacy, but not satisfaction, increased after 12 weeks of parent-mediated intervention, as suggested. When comparing efficacy scores to parental age, we found no significant correlation. Alternatively, it was found that the father's education level was inversely related to self-reported efficacy.

Conclusions: Parent mediated intervention has been well studied. After the completion of these programs, parents report higher feelings of efficacy in their skills as a parent. More research is needed for insight into what increases self-reported efficacy and what can be implemented to increase self-reported satisfaction scores in parents.

Abstract:

Bystander intervention programs for sexual assault and dating violence encourage bystanders to prevent violent acts on campus by changing the social climate, intervening in high risk situations, and supporting survivors of such violence. The purpose of this study was to further understand the actions of bystanders in situations related to dating violence and sexual assault on college campuses. Over 500 students from a public university in the southeastern United States voluntarily completed an online survey asking about risky situations they had witnessed with follow up questions about their responses to these situations (e.g., whether they intervened or not). The results of the study revealed common bystander responses to unsafe dating or sexual situations. Bystanders most commonly reported giving victims supportive advice. Examples include recommending that victims seek outside help or personally assisting victims. These results could help further educate college students on how to recognize warning signs of inappropriate behavior and on ways of helping friends and classmates.
Abstract:

Alcohol abuse is a prominent issue affecting college-aged students, as nationally 1,825 college students between the ages of 18 and 24 die from alcohol-related unintentional injuries each year. This number not only affects the lives of those involved, but also of their peers, families, and friends. The purpose of the study is three-fold: 1) to describe the background characteristics of college students' alcohol and other drug use, mental health, and impediments to academic performance; 2) to compare perceptions of peer norms in the areas of alcohol use, tobacco and other drug use with actual behavior; and 3) to determine if a relationship existed between Greek and non-Greek students' perceptions of normative behavior and students' actual use.

This quantitative study utilized a survey research design. Specifically, the data derived from the American College Health Association (ACHA) National College Health Assessment (NCHA). The ACHA-NCHA is a nationally recognized research survey that collects data about college students' health habits, behaviors, and perceptions. Specifically, the survey covers health issues such as alcohol, tobacco, and other drug use; sexual health; weight, nutrition, and exercise; mental health; and personal safety and violence. The ACHA-NCHA survey contains 66 questions and assesses college student attitudes, perceptions, and opinions about alcohol and drugs. The target population (n=3,505) included full-time undergraduate students enrolled at a public four-year institution in the southern U.S. who participated in the 2009, 2011, 2013, and 2017 administration of the ACHA-NCHA survey. The sample of students based on Greek membership included (n=1,317 Greek involvement and n=2,166 non-Greek involvement). SPSS software version 24 was used to analyze the quantitative data. The analytic approach included descriptive statistics (e.g., frequencies, crosstabulations), and inferential statistics (e.g., chi square analysis, independent t-test, ANOVA). Preliminary results showed that students' alcohol use and perceived use of alcohol in the last 30 days differed. Overall, rates of actual use of alcohol included the following: 10-19 days (18.7% actual vs. 23.4% perceived), 20-29 days (6.3% actual vs. 19.4% perceived), and used alcohol daily (1.9% actual vs. 28.1% perceived). Comparative results of alcohol use in the last 30 days by Greek and non-Greek membership revealed differences. Overall, non-Greek consumed alcohol 10-19 days, 20-29 days and used daily indicated 17.5% compared to Greek members (58.7%). The significant rise of alcohol consumption among college students demands attention by academic leaders, student affairs professionals, and student leaders. The results of this study could inform Greek organizations and campus at large about potential strategies to educate today's diverse college students. This study has implications for practice, policy and future research.
Abstract:

Dreams of school desegregation were once met in Alabama, as showcased by the history of Tuscaloosa's former powerhouse: Central High School. In 2013, though, journalists brought nationwide attention to a nationwide problem: Lifted mandates and backroom deals caused Central High School to split into three "neighborhood" schools, essentially re-segregating the existing district. Now, news reports paint Central High School as a failing school, with a student population that is 99 percent Black.

However, a critical analysis of the local reporting on Central High School indicates that the newsroom may have exacerbated stigmas against the school by perpetuating false and polarizing narratives of Black violence and White success. Instances of this can be found in the local news' underreporting of crime at the system's predominantly White school, as well as its underreporting of academic success at the new Central High School. This report first argues that these narratives are not uncommon - they have in fact shaped a White canonical understanding of race, and, if not corrected, they can (and have) shaped reality. Present in the negative spaces of this canon, though, is a web of counter-stories woven by oral histories and remembrance. Mobilization Against Re-Segregation seeks to illuminate these under-reported narratives of Black authority, excellence, and autonomy by examining the legacy of Black student resistance in post-slavery America. By highlighting these histories, from the building of freedmen's schools to today's student walkouts, this report urges researchers, reporters, and consumers of media to critically examine the ways in which they write and read about race, education, and - most importantly - students.
Session 1: 8:30-10:00 | Education; Social Sciences
Category 1: Work in Progress
Poster Number: 34

Student Presenter: Emily Hall
Title: Self-Presentation as a Mediator of Aggression and Narcissism

Abstract:

Not Publishable
Abstract:

This study aims to investigate how the use of punctuation (i.e., exclamation points and periods) can influence the perception of the sender of an email in a professional setting. The importance of this study is aimed at understanding communication that takes place in online settings. Often times when communicating online, individuals lack the benefits of using the tone of voice and other non-verbal behaviors to establish a good first impression. This is critical when the context of communicating online bears no room for the use of emoticons or repeated letters to convey a positive impression (i.e., work emails or emails sent to professors). The study will recruit from a sample of college students at the University of Alabama. Participants will be presented with a scenario in which they are reading an email that is sent by a fictitious person with a gender neutral name and the person is looking to set up an interview for a job position. Participants will be randomly assigned to one of the following conditions: Condition 1; where the reader will receive a message in which the sender is using exclamation points or Condition 2; where the reader will receive a message in which the sender uses only the period. Specifically, we predict that the use of an exclamation point in the message will increase the reader's ratings on trustworthiness, approachability, and the likelihood of wanting to meet with the sender of the message in person. Participants will also be asked to rate if they believed the sender of the message gave off either a positive or negative impression. Past research has found in casual settings (i.e., texting), the use of a period is often times interpreted as being insincere (Houghton, Upadhayay, Klin, 2017). Another study has found that the use of exclamation points results in the readers perceiving the message more positively than when using periods (Mendoza, 2016). Researchers predict that those who are in Condition 1 will report higher scores on the dependent measures of trustworthiness and approachability. It is also predicted that those in Condition 1 will show a greater likelihood of wanting to meet the sender of the message in person. Finally, those who read messages in Condition 1 will report the sender of the message as more positive than those who read the message in Condition 2. Researchers believe that the conclusions of the findings will help anyone looking to make a good impression online use exclamation points to their advantage.
Abstract:
This is an ongoing research project on the social media and discussion site "Reddit." The goal of this project is to increase understanding of the effects of time, growth, and social norms on a variety of outcomes in group behavior online, including likelihood of participating in online discussions, sustained participation over time, hostile commenting, and supportive commenting. We analyze a corpus of roughly 1.7 billion comments posted from 2005-2017 on Reddit. Currently, the research team is analyzing how specific users can affect particular subforums (called "subreddits"), and vice versa, in regards to hostility. The team seeks to identify whether a hostile user can turn a formerly nonhostile subreddit hostile and whether a hostile subreddit can turn a formerly nonhostile user hostile.
Title: The thoughts, attitudes, and fears of pre-internship music therapy students, pre-service music education students, and music therapy and education professors.

Abstract:
The thoughts, attitudes, and fears of pre-internship music therapy students, pre-service music education students, and music therapy and education professors.

Background: Previous studies have assessed the perceptions of clinical experiences of music therapy students (Wheeler, 2003; Clements-Cortes, 2015) and music education students (Campbell & Thompson 2007; Conway 2002). One study specifically compared music therapy and music education students' fears directly related to internship (Madsen & Kaiser, 1999). To date, no study has included the perceptions of music education and therapy students and professors' perceptions of clinical experiences related to internship.

Purpose: The purpose of this study was to investigate the perceptions of music education and music therapy students and music education and music therapy faculty and staff, including the following research questions:

1. What common fears do pre-service/pre-internship music education and therapy students share?
2. Is there a relationship between supervised clinical hours and fears?
3. Do professors implement what they think is an appropriate number of clinical hours? If professors are not implementing the number of clinical hours they think are appropriate, why not?

Method: Survey questions were based on Madsen and Kaiser (1999) and Wheeler (2003). The Qualtrics link to the survey was sent via email to music therapy students (n=6), music education students (n=12), music therapy faculty and staff (n=2), and music education faculty and staff (n=7). The survey included Likert scale and free response questions to evaluate perceptions of clinical experiences. Respondents were given approximately one month to complete the survey.

Results: Of the 18 student surveys, 9 were completed (50% response rate). Of the 9 faculty and staff surveys, 2 surveys were completed (22.2% response rate), both by music therapy professors. Music education and therapy students listed different fears about internship; there was no clear relationship between the number of clinical hours and students' fears. Students who responded feeling as though they've had enough clinical hours, their fears were more likely to be specific and out of their control. Music therapy students listed the desire for more written feedback, while music therapy faculty and staff thought students should receive written feedback only some of the time. The faculty and staff who responded stated that they were able to facilitate the number of hours they think is appropriate for students.

Conclusion: The results of this study suggest that students value clinical experiences, though students, who report having "enough" hours, still report fears prior to internship. The findings of this study are different than previous research (Madsen & Kaiser, 1999), in that music education and therapy students had different fears. These results may have been due to the small sample size; future research should be conducted with a larger sample size, possibly at multiple universities. Faculty and staff working with music therapy students should consider addressing students' concerns about clinical hours, supervision, and feedback, as students were not always satisfied with these areas of their clinical experiences; it is likely that this disparity of perceptions of clinical hours, supervision, and feedback are similar for music education faculty, staff, and students, though the results of this study were limited to music therapy faculty, staff, and students.
Abstract:

This study aimed to assess whether the degree to which Coping Power and Mindful Coping Power group leaders embodied mindfulness affected the outcomes of the students in their groups. Lochman et al. (2009) administered Coping Power groups in Tuscaloosa schools and found that students showed improvements in social skills and school performance post-intervention. When van Aalderen et al. (2012) interviewed participants in a mindfulness-based intervention about their experience, they found that participants valued the leaders' practice of mindfulness regularly outside of the program. Meiklejohn et al. (2012) reviewed literature on mindfulness-based interventions for teachers of kindergarten through 12th grade and found that embodying mindfulness reduced teachers' stress levels and improved their mood, which in turn improved their students' experience in the classroom. In validating a self-report measure designed to assess teachers' degree of mindfulness embodiment, Frank et al. (2016) found that different facets of mindfulness contributed to increased efficacy in different aspects of teaching. While the previous literature suggested a link between intervention leaders' mindfulness embodiment and better participant outcomes, we did not find a study that directly examined the existence or the strength of this link, particularly involving Coping Power programs. In the present study, Coping Power and Mindful Coping Power groups were conducted in Tuscaloosa schools with fifth graders. Student outcomes were assessed by their teachers and parents' report, as well as the child's self-report, of the Behavior Assessment System for Children (BASC), both before the intervention at the end of fourth grade and after the intervention at the end of fifth grade. To assess the leaders' embodiment of mindfulness, each group leader filled out the Five Facets of Mindfulness Questionnaire (FFMQ). The five subscales included in this measure are nonjudge, nonreact, awareness, meaning how aware they are of their feelings and surroundings, describe, meaning one's ability to explain what they are feeling and thinking, and observe, meaning how attentive they are to their surroundings and their feelings. Then, we used SPSS to conduct ANCOVA and correlational analyses to assess the existence of the relationships between the BASC and FFMQ subscales. We found that the leader's total FFMQ score was strongly related to improvements in children's prosocial skills, meaning social skills, leadership and adaptability according to the teacher and parent reports and to improvements in externalizing problems, meaning aggression, conduct problems and hyperactivity, according to the teacher reports, suggesting that the degree of mindfulness embodiment has an impact on how effective the program is for the participants. Out of the subscales, nonreactivity, describe and nonjudgment were most strongly related to improved student outcomes, suggesting that the ability to remain calm and articulate feelings serves as a model of behavior for children to adopt. Investigating how leaders embodying mindfulness, especially when facilitating an intervention that aims to ameliorate students' levels of reactive aggression and other areas including social skills, impacts student outcomes related to those areas,
can aid researchers in understanding what makes the program effective and in developing ways to better train leaders and optimize the program's effectiveness.
Student Presenter: Madeline Hirschfield
Title: Exploring the Effect of Social Rejection on Freshman Retention

Abstract:
My research project, Exploring the Effect of Social Rejection on Freshman Retention, is in progress in partnership with my faculty mentor, Dr. Joshua Pederson. The purpose of this study is to understand what role social rejection experienced by freshman students plays in retention at higher education institutions. While other research shows that social integration is influential in improving retention, there is limited in-depth research about what effect social rejection has on retention. For the purpose of this study, a Qualtrics survey consisting of 38 questions concerning a social rejection experience during a student's freshman year and how that experience affected their feelings of persistence was responded to by 88 individuals. The survey results and data will be evaluated to discover the different facets of social rejection's effect on retention, including if social rejection has an effect, what types and levels of social rejection has an effect, and if there are demographic differences in the effect.
Student Presenter: Madeline Hirschfield  
Title: Political Discussions Within the Family: Examining Difficult Family Conversations

Abstract:
My research project, Political Discussions Within the Family: Examining Difficult Family Conversations, was initially sparked by a project assignment in my Family Communication class. The study was then expanded with the assistance of my faculty mentor, Dr. Mills. The purpose of this study is to understand how families deal with difficult conversations, specifically concerning politics. Difficult conversations within the family is an area of research that receives attention, but there is little research examining difficult conversations within the family concerning politics; this may be because political discussions within the family are usually avoided due to perceived consequences, such as anger and decreased liking (Keating, Russell, Cornacchione, & Smith, 2013), and to preserve the well-being of the family atmosphere (Levinsen & Yndigegn, 2015). For the purpose of this study, eight individuals were thoroughly interviewed. The interviews, resulting in nine pages of transcript, were then analyzed to find key themes. My main themes were based on similarities in why disagreements happened, participants' views on family disagreements, and the origin of political views. Findings suggest that motivated reasoning causes disagreements between family members with opposing views, negative consequences associated with difficult conversations cause family members to avoid this type of situation, and conversations with stronger family ties can lead to more heated arguments compared to conversations with weaker family ties. In addition, findings suggest that the origin of political views follows the deliberative learning model (DLM) theory, which theorizes that many foundations, including family members, friends, and more, are responsible for one's political growth and development (McDevitt & Kiousis, 2006), as opposed to the transgression model of socialization, which assumes that parents transfer their political beliefs to their children (Shulman & DeAndrea, 2014). These findings confirm and expand on previous research done in the field.
Abstract:

Splitting property in divorce proceedings often includes awarding of the marital residence. This study focused on the gendered outcomes of property dispositions. I strove to understand who receives the house in a divorce settlement, and discern if there are general advantages or disadvantages according to gender. I used the public access computer in the Domestic Relations office of the Tuscaloosa County Courthouse to view full divorce files, and I then recorded the data in a spreadsheet, consisting of demographic information about each couple, as well as who filed for divorce, and who had the highest income at the time of divorce. I compared this data to who actually received ownership of the property. The results showed that women are less likely to receive the house than men, even when children are involved. Women are also more likely to be the one filing for divorce, yet do not usually win the property even if they want it. These data can be used to identify the gender disparities within property dispositions, and to illuminate how the law itself discourages a "fair and equitable" division of the marital property. Although judges cannot reach outside their legal bounds, they can recognize the general disadvantage of women in divorce cases, and use this knowledge when making their decisions.
Student Presenter: Justine Hostler
Title: Impact of Mock Code Simulation based education on a New Nurses comfort and confidence.

Abstract:

Background: Simulation based education is a technique that provides students with realistic patient environments for the purpose of learning, training, and practice. These goals in turn directly impact the nurses comfort levels in similar situations. Exposure to a situation before experiencing it on the unit has been shown to improve confidence and competence. Simulation based education provides opportunities for hands on experience without risk of harm to a patient. Simulation is utilized heavily in BSN programs to help expose nursing students to what they will encounter in future practice.

Methods: A literature review was conducted initially to assess current research regarding simulation based educations effectiveness, especially in most code situations. A pre-survey and post survey of 76 nursing students was conducted to evaluate comfort levels, ease of mind regarding independent decision making, confidence in evidence based practice implementation and the risk for stress interference.

Results/Findings: The pre-survey found that 75% of students were on the fence regarding their comfort intervening in a code situation. While 57% percent of students were uncomfortable making independent decisions and unconfident. However, 72% of students reported they were confident that their decisions made would be based on evidence based practice and 57% reported that they were confident that stress would not interfere in the care provided. After the simulation 91% of students reported feeling better prepared to care for real patients. While, 88% reported a greater confidence in decision making skills.

Conclusions/Implications: Even with the implementation of rapid response teams at most hospitals across the country, it is still important to educate and ensure proficiency of these skills of all nurses. It is the nurses and new nurses that need more education regarding code responses to improve patient outcomes by ensuring competency and confidence of the unit nurse. The survey conducted showed the students initially felt more concerned with the quality of care they would provide compared to any personal stress. Additional research should be conducted to specify the individual's definitions of evidence based practice and to clarify each individual's personal beliefs. Additional research that evaluates comfort levels and performance with the implementation of simulation based education as a formative assessment rather than a summative assessment is needed.
Abstract:

Context: The number of children and adolescents diagnosed with attention-deficit/hyperactivity disorder (ADD/ADHD) has increased exponentially in recent years. Previous studies and consensus statements suggest that ADD/ADHD are factors that may modify the risk of concussion and duration of recovery. However, there is limited data on the effects of ADD/ADHD on baseline neurocognitive performance and symptoms in high school student-athletes.

Objective: To develop an understanding of the performance of high school student-athletes diagnosed with ADD/ADHD on baseline neurocognitive performance and symptoms and examine group differences between individuals with and without ADD/ADHD.

Design: Retrospective cross-sectional study.

Setting: Large, public high school in the New York metropolitan area.

Patient or Other Participants: 658 high school student-athletes (9.6% ADD/ADHD), aged 14-18 years, over a 4-year period from 2014-2017.

Interventions: All student-athletes completed a computerized baseline neurocognitive test, using the Immediate Post-Concussion Assessment and Cognitive Training (ImPACT) Software. Main Outcome Measures: ImPACT neurocognitive test composite scores (verbal and visual memory, visual motor speed, and reaction time), total symptom score, and criteria for invalid assessment (word memory learning % correct, design memory learning % correct, X’s and O’s total incorrect interference, impulse control, three letter total letters correct, and three letters average counted correctly).

Results: Student-athletes diagnosed with ADD/ADHD (N = 63) produced worse composite scores on verbal memory (p = .01), visual memory (p < .001), and visual motor speed (p < .001) at baseline than individuals without ADD/ADHD. Athletes with ADD/ADHD also produced higher total baseline symptoms scores (p < .001). Student-athletes with ADD/ADHD were approximately 3-times more likely to produce invalid baseline assessments ( 2 = 17.42, OR = 2.98, p < .001) than those without ADD/ADHD. More specifically, individuals with ADD/ADHD were 3-times more likely to produce invalid scores on memory, as measured by the three letters total correct invalid criteria ( 2 = 6.14, OR = 2.92, p < .013) and memory distractor scores, measured by the three letters average invalid criteria ( 2 = 19.34, OR = 3.28, p < .001).

Conclusions: These findings suggest that high school student-athletes reporting a diagnosis of ADD/ADHD produce overall lower ImPACT composite scores and report higher total symptom scores at baseline. Additionally, individuals with ADD/ADHD are also more likely to produce invalid baseline computerized neurocognitive assessments at baseline. These findings emphasize special consideration for individuals with ADD/ADHD, regarding normative baseline values, and post-concussion assessment and management.
Abstract:

Food insecurity is defined as: households that, due to insufficient funds and/or lack of resources, did not have the consistent ability to access enough food for their household throughout a year (Coleman-Jensen et al., 2017). Food insecurity impacted 12.3% of U.S. households in 2016 (Coleman-Jensen et al., 2017). The focus of this study is to examine identifiable triggers for food insecurity, among low-income, single mothers. Among food insecure households, 31.6% had incomes below 185% of the poverty threshold, 16.6% had children present, and 31.6% were headed by single women (Coleman-Jensen et al., 2017). Maternal depression has been identified as an aggressor in promoting food insecurity among low-income households (Garg et al., 2005; Heflin et al., 2005). Those living in poverty have greater risk for stress and for developing depressive symptoms. Beeber and colleagues (2008) note the strong relationship between poverty and depression, especially among mothers who head a low-income household. By neglecting to provide appropriate support for this group, we leave them to struggle against mental and physical challenges without adequate resources, perpetuating the problem of food insecurity. The purpose of this study is to provide a literature review and policy analysis investigating low-income single mothers' experience with depression and food insecurity.

First, this study will conduct a thorough literature review on food insecurity among low-income, single mothers. A policy analysis will be conducted to investigate policy changes to enhance the well-being of this vulnerable consumer population. This research will support policy recommendations for the need to have a wide range of "safety net" programs, designed to help at risk consumers in their everyday lives, ultimately with the goal to minimize the experience of food insecurity and its negative effects.

This study's recommendations for policy are based on the idea that there are identifiable triggers for food insecurity and depression can act as an aggressor in promoting food insecurity, particularly among low-income, female-headed households. Although triggers can vary, the aim is to identify more common factors that could be used to influence policy. Given the link between food insecurity and depression, some suggest policy reform for nutrition, mental health, and poverty. By providing access to a multitude of "safety net" programs, such as food and health programs low-income households are able to take action against food insecurity. Disadvantaged consumers generally do not just have one ailment or obstacle, so a range of programs allows for broader support. To properly design interventions for low-income, female-headed households, we need to analyze the relationship between depression and food insecurity.

To be effective in fighting food insecurity, we must create programs and policies based on needs and risks of vulnerable consumers. To accomplish this goal, we wanted to analyze specific barriers to food acquisition. Food insecurity is well studied; there is a gap about mental health issues among low-income households. To help support the policy recommendations and to provide specific policy and education program suggestions, future work will empirically investigate the links between mental health issues and food insecurity among single-mothers.
Abstract:

In the United States, about 1 of 700 babies are diagnosed with Down syndrome (Parker et al., 2010). It is known that Down syndrome individuals will experience signs of dementia and some later Alzheimer's Disease in their 50's. The proposed study will look at the cognitive decline in these individuals by examining phonological memory and language comprehension. It is noted in a previous study that two phonological measures-digit span and nonword repetition tasks-show different results in adolescents even though they were expected to show similar results. The digit span task showed improving scores over a two year period while the nonword repetition task showed a significant decline (Laws & Gunn, 2004). The proposed study will attempt to replicate these findings in an effort to find out why these two measures produced two different results. It is hypothesized that the nonword repetition task showed a decline in the adolescents because it requires speech articulation and language comprehension which can be difficult for those with Down syndrome. The participants in this study will range from adolescents to young adults and will be given the digit span and nonword tasks. We will examine these results and see the correlation between the specific tests and other intelligibility and language based measures to further understand the difference in the results.
Abstract:

While most of the world identifies as having some religious influence in their lives, there are varying levels of religiosity due to it being such a personal experience. This research will examine the differences in religious experience and which differences are seen when examining empathy, the Big Five, and fundamentalism within three varying types of religiosity: Intrinsic, Extrinsic, and Quest. An ethnically diverse and gender varying population was used for gathering data. The group adults (18 and up) consisted of approximately 625 students and 625 Mechanical Turks. When gathering data for all 4 components, 4 respective questionnaires were administered. Religious motivation was divided into 3 categories: Intrinsic, Extrinsic, and Quest, and was examined through Peter Hills’s (2004) Revised Religious Life Inventory (RRLI). The Big Five Traits were identified by Samuel D. Gosling’s (2003) Ten Item Personality Inventory (TIPI). Furthermore, empathy was identified with Mark H. Davis’s (1980) Empathy Questionnaire which divided empathy into empathic concern and perspective-taking. The questionnaires were administered electronically and anonymously. Preliminary research showed high rates of perspective-taking empathy have been shown to correlate with a higher level of empathic concern (Davis, 2004). Therefore, I hypothesize that higher rates of both types of empathy, especially perspective-taking, will be seen in Quest motivated individuals, while only higher empathic concern will be seen in Externally motivated individuals. I further estimate that low perspective-taking and empathic concern will be observed in those who are Intrinsically motivated. Within the Big Five, Agreeableness and Conscientiousness levels have been shown to be the biggest factor in religiosity (Gebauer, Bleidorn, Gosling, Rentfrow, & Lamb, 2014). However, overall, the Big Five personality traits showed the strongest correlations with Intrinsic religiosity and little to none with Extrinsic and Quest (Robbins, Francis, Mcllroy, Clarke, & Pritchard, 2008). I am also hypothesizing that Quest participants will show higher levels of Openness, Extraversion, Agreeableness, and lower levels of Neuroticism. Externally motivated participants are thought to present as higher in Extraversion, Conscientiousness, and Agreeableness. However, those who are Intrinsic are estimated to be low in Openness, Extraversion, and Agreeableness while being high in Conscientiousness and Neuroticism. Furthermore, Fundamentalism is being estimated to show higher levels in Intrinsic individuals and Extrinsic individuals with lower levels showing in Quest participants. The data collection and analysis for the study is in its beginnings, but once finished, conclusions and limitations will be analyzed.
Abstract:

The goal of this literature review is to illuminate the shortcomings of the DSM-V's Post-Traumatic Stress Disorder (PTSD) criteria. Despite the many changes the DSM criteria have experienced in decades past, a definition has yet to be found that recognizes all divisions of trauma. Alternative diagnoses of Acute Stress Disorder (ASD) or Subthreshold PTSD fail to cover circumstances in which trauma fails to meet diagnostic criteria while still exhibiting significant symptoms. Unrecognized traumas include: home foreclosure, miscarriage (Lansing, Plante, & Beck, 2016), traumatic death of a public figure/celebrity (such as a presidential assassination), separation from caregivers by Child Protective Services or parental incarceration, cumulative traumas, etc. With such traumas disregarded, cases are ignored in studies that could yield significantly different results. Additionally, individuals who are unable to receive treatment for their trauma-related symptoms suffer, particularly during development. Paralleling concepts discussed in Doka's 1989 presentation on disenfranchised grief, the lack of diagnostic/evidence-based support for those involved causes unacknowledged loss, nonexistent social support, and an inability to participate in the grieving process (or in the case of trauma, inability to receive appropriate treatment). Maladaptive coping, impaired functioning, and other adverse symptoms of mental illness develop in response to cumulative, complex, and/or non-qualifying traumas that "are typically assessed in response to only one qualifying Criterion-A traumatic event," (Lansing, Plante, & Beck, 2016). Unless future DSM revisions include a trauma spectrum, research will repudiate statistically significant cases and individuals will remain shoehorned into ill-fitting diagnoses, if lucky enough to receive a diagnosis at all.
Student Presenter: Sera Levy, Andrew Penunuri, Madison Smith, Blaire Taggart,
Title: The Association Between Trauma and Alcohol Use in College and Community Samples

Abstract:
Research has shown a correlation between trauma and subsequent alcohol use. However, studies have yet to test whether there are differences in alcohol use patterns among different populations exposed to trauma. The college environment has been shown to provide a unique setting for drinking, so this study seeks to compare the drinking patterns of college students versus those in the general population that have experienced traumatic events. The present study used secondary analysis of survey data on drinking patterns in relation to trauma in two different populations: college students and adults in the general population. Results of these analyses revealed important information regarding the association between trauma and alcohol use and various patterns of drinking in these populations. These results are important for identifying co-occurring mental health conditions in different settings.
Session 1: 8:30-10:00 | Education; Social Sciences
Category 2: Completed Work
Poster Number: 56

Student Presenter: Reilly Lockwood
Title: Romantic Infidelity Project

Abstract:
Not Publishable
Abstract:

The gender gap in Science, Technology, Engineering, and Mathematics (STEM) careers is well documented, and many attribute this gap to the stereotype that STEM careers are masculine. While many factors contribute to girls relatively low interest in STEM, the influence of friends and peers on a girl's future career decision is not well documented. This is despite evidence that friends and peers are a large sphere of influence in the lives of adolescents. The present study will examine gender role conformity in high school girls and their peer groups to see if it plays a role in determining whether a girl pursues a STEM career in higher education and in career interests. The study examined three hypotheses: H1) Girls who endorse less traditional gender stereotypes are more likely to be interested in STEM careers; H2) Girls with higher interest in STEM belong to groups that are less likely to conform to traditional gender roles; H3) Girls who are enrolled in STEM classes and have less gender role conflict across friend groups will have higher interest in STEM careers. Female participants (N=69) were recruited from central Alabama high schools who were enrolled in advanced math and science classes. Data was collected through an online survey and the results were analyzed using correlations and a regression. Results indicated various amounts of support for each hypothesis: H1 was supported in that girls who endorsed less traditional gender stereotypes were more interested in STEM careers; H2 was partially supported in girls with higher interest in STEM was related to their friend's gender stereotypes, but not other peer group's gender stereotypes; H3 was not supported as participant's friend's gender stereotypes were related to interest in STEM regardless of the participants own beliefs. In conclusion, the results suggests that girls are more likely to be interested in STEM, and thus pursue careers in the field, if their friends do not hold traditional gender stereotypes. The study is limited by its use of correlational methodology and a small, convenience sample that may not be representative. It is also possible that the unmeasured social movement between social groups may limit their influence.
Abstract:

Social roles related to gender are evident in many areas of society, such as work, education, and leisure activities, but these roles are also evident in the online gaming world. The goal of this study is to examine the differential treatment of male and female characters in World of Warcraft (WoW). Two trained research assistants (one male and one female) acted as confederates while they played as male and female characters in masculine roles and as female characters in feminine roles. The confederates purposefully died twice consecutively after killing the first boss in the dungeon instance to elicit comments from the other players. The comments other players made were recorded and coded. Differences in the comments made by male and female player characters were examined. Comments were coded into three main types: instructional/questioning, criticizing, or apologetic. As hypothesized, male characters (n = 19) made instructional/questioning or criticizing comments more often than female characters (n = 13) and female characters (n = 3) made apologetic comments more often than male characters (n = 1).
Student Presenter: Katherine Metcalf
Title: Beware of Big Brother: Teaching High School Students How to analyze Human Desire in George Orwell's 1984 Through a Lacanian Psychoanalytic Lens

Abstract:
This project presents reasons why highly motivated high school students should learn how to analyze human desire through a Lacanian Psychoanalytic perspective. Curious high school students constantly ask why some of the novels they read in their English classes help them better understand themselves and the events that happen in their daily lives. Though George Orwell's novel 1984 serves as a fictional depiction of a dictatorship, analyzing The Party's control over Winston Smith's human desire can serve as parallel representations to the growing pains of average teenagers. When learning the basics of Lacanian terms like objet petit a, Desire of the Other, and The Symbolic Order, high schoolers can apply these terms when analyzing why The Party eliminates Winston's desires and draw conclusions about how the people in their environment influence their personal desires. As a result, the aim of this project shows how high school students will learn a basic knowledge of Lacanian Analysis to apply in college-level English classes and understand how the people around them heavily influence their own desires. Through class discussions and short-response essays, high school students will learn how The Party's elimination of Winston's personal desires serves as a direct comparison to how issues like peer pressure can make teenagers change their own desires in order to fit in with certain crowds and cliques. Overall, this lesson conveys reasons why high school students should act aware of how their peers, parents, and societal forces can positively and negatively influence their wants and values.
Student Presenter: Megan Michael  
Title: Hot and Cold Executive Functioning in Individuals with Restrictive Disordered Eating  

Abstract: 
Evidence has shown that individuals with restrictive disordered eating patterns, such as those suffering from anorexia nervosa, exhibit executive functioning deficits. There is also research supporting that executive functioning differs between high emotional stress conditions and neutral conditions, leading to a distinction between hot and cold executive functioning. However, hot and cold executive functioning has not been studied within populations with restrictive disordered eating patterns. The present study aimed to examine the relationship between stress, executive functioning, and restrictive disordered eating behavior using a within-subjects and between-subjects experiment. Participants were 87 undergraduate students at a large university in southeastern United States, divided into an experimental group (n = 44) and a control group (n = 43) based on scores from the Restraint subscale of the Eating Diagnostic Examination Questionnaire. All participants completed various questionnaires on emotion regulation, perfectionism, and eating behaviors. Then participants completed the Wisconsin Card Sort Task. The participants were given a "failure dialogue" where they were shown poor results, told they performed below the minimum requirement, and asked to retake the test. Subjective Units of Distress Scores were obtained before and after each trial. Results are being analyzed and will be ready to be presented by the URCA Conference.
Abstract:

Attachment is an emotional bond that first forms between an infant and a primary caregiver. The type of attachment that forms is based on the quality of care the infant receives which then influences whether or not the infant develops a sense of trust. (Ainsworth, 1970). This first attachment relationship provides a template, or internal working model, for relationships across the lifespan, to include friendships and romantic relationships. During the adolescent period of development, the desire for close, intimate relationships outside of the family begin to emerge (Sullivan, 1953), but one's attachment style can influence the course of friendships and romantic relationships. Given that adolescents spend a considerable amount of time on social media, this has become an important way that adolescents interact, and social media has become an important aspect in the development of interpersonal relationships (Subrahmanym & Smahel, 2011; Subrahmanyam, Smahel, & Greenfield, 2006). Similar to face-to-face interactions, online interactions can be difficult and challenging. For example, Casper and Card (2010) found that jealousy was a primary reason that friendships transform to antipathetic relationships in adolescence. Similarly, Muise, Christofides, and Damarais (2009) found that jealousy in romantic relationships is intensified because of Facebook usage (Muise, Christofides, & Demarais, 2009). In the current study, with an sample of primarily White or Caucasian (82%), female (91%) college students (n = 164, M age = 20 years), we explored the associations among attachment anxiety, attachment avoidance, general Facebook jealousy, and Facebook jealousy specific toward a former friend. We found a strong, positive association between attachment anxiety and general Facebook jealousy (r (164) = .53, p < .001). Higher levels of attachment anxiety was also positively associated with Facebook jealousy specifically toward their former friend, but the magnitude of the association was slightly smaller (r (161) = .48, p < .001). We found a positive association between attachment avoidance and general Facebook jealousy (r (161) = .20, p < .05), as well as Facebook jealousy toward a former friend (r (158) = .23, p < .001). Finally, participants reported higher levels of general Facebook jealousy (M = 2.24) than Facebook jealousy toward their former friend (M = 1.83; t(161) = 9.80, p < .001). In conclusion, individuals with higher levels of attachment anxiety experience slightly higher levels of general Facebook Jealousy than Facebook jealousy specifically toward a former friend. Perhaps the reason that individuals are experiencing higher amounts of jealousy toward their general online "friends" compared to their real-life former friend is that they are more concerned about their present relationships, rather than ones they have lost. Further research is needed to explore the connection between levels of jealousy in friendships and Facebook usage, as well as other social media platforms.
Student Presenter: Nicole Moczisko
Title: It is alright to be a psychopath if you are white: An exploration of jury sentencing of psychopaths based on racial differences

Abstract:

The current study outlines the problem of racial biases in the courtroom when psychopathy is a factor. Although the rhetorical purpose is novel, the concrete purpose is to make implications for the criminal justice system and reduce biases in jurors. This study will examine jury decision making in a trial where the defendant is either a black psychopathic male or a white, non-Hispanic psychopathic male. Participants will receive vignettes in order to gauge biases based on how they sentence prospective defendants. Other confounding variables which often taint the study will be controlled for so that the bias is clearly seen. It is important to study this phenomenon to find whether race is a driving factor larger than the psychopathy diagnosis. The study has not yet been conducted, but it is hypothesized that black psychopathic males will receive harsher sentences than white, non-Hispanic psychopathic males.
Student Presenter: Elizabeth Mojica
Title: Educational Inequities in Relation to High School Performance

Abstract:

Not Publishable
Student Presenter: Sarah Moore
Title: The Impact of Previous Calculus Experience on the Post-Secondary Calculus Student Experience

Abstract:
This research studied the effects of previous math background on student performance and attitude in post-secondary calculus education. Using the Mathematical Association of America's Characteristics of Successful Programs in College Calculus dataset of approximately 14,000 students from a variety of institutions nationwide, student characteristics and experiences were analyzed via pre- and post-course survey responses. The student experience was defined by persistence with STEM, self-confidence, performance, and outlook on math. This research also evaluated the relationship between these student attributes and student-reported teaching behaviors. The findings of this research could lead to a better understanding of the implications of retaking calculus for students of all experience levels.
Abstract:

Justification: Our Socio-Economic Effects of Non-Profits study informed the West Alabama Chamber of Commerce and investors about the true impact of local non-profit organizations, economically and socially. Participating students were introduced to leaders and charitable causes in the community, as well as new opportunities to gain real-world business experience.

Purpose: To provide numerical data about the economic and social effects of non-profit organizations in the 7-County region of West Alabama, and to disprove the common notion of non-profits as simply "charities" by exhibiting the substantial influence that they actually do have. This report was expected to be part one of a multiple part study.

Method: We had four research team members: Whitney Cravens, Austin George, Alyssa McLeod, and Cory Myers. We analyzed financial documents from seven Tuscaloosa-based non-profits, and used the values from these seven to show what caliber of impact all non-profits in the seven counties have on the region. Fiscal years 2011-2015 were used to analyze the financial information, and will continue to be used as we draw more information for phase two of the study this year.

Results: Direct economic impact equaled $68,015,526 in 2015 from just the seven selected non-profit organizations. This is calculated with all expenses being combined with $5,079,551 in donated value provided to the community and $1,498,477 provided in volunteered value. The indirect and induced effects of non-profit action can be indefinite in addition to the known direct impact. (This will be expanded on in phase two of the study)

On social impact, non-profit organizations each have their own production models that they use to achieve their desired social impact in accordance with their organizational mission. Many take inputs of relatively little value and reassemble them into what becomes an important impact for clients: examples may be blankets that provide warmth or healthcare that provides quality health for years to come.

Conclusion: Non-Profits take inputs that are not highly valuable to some and turn them into outputs that are very important for people who are in need. When accounting for all the education, support, healthcare services, and many other programs led by these organizations, the return on investment is significant in many ways. In an increasingly commercial climate, the impact of non-profits has been overlooked. It is important for us not to let this trend continue, as NPOs are capable of affecting a large portion of the community in ways that are not addressed by their profit-driven counterparts.
Abstract:

Psychological control (PC) is defined as parental behaviors that impose on a child’s cognitive, emotional, and psychological experiences (Valdes, et. al., 2016; Barber, Xia, Olsen, McNeely & Bose, 2011). Some have suggested that parental PC may increase the tendency for children to use relational aggression with peers (Lau, Marsee, Lapre, & Halmos, 2016), perhaps because youth model PC behaviors with peers or PC leads them to develop schema of others as being rejecting which, in turn, may increase aggression (Kuppens, Laurent, Heyvaert, & Onghena, 2013; Lau, Marsee, Lapre, & Halmos, 2016; Nelson & Crick, 2002). The current study investigated the relation between parental PC and adolescents’ relational aggression, while considering if rejection sensitivity mediated the association between the two. As an alternative to the mediational model, we also considered if rejection sensitivity would exacerbate the relation between PC and adolescent relational aggression.

Participants were 63 adolescents (49.3% male; 55% African-American) between 11 and 15 years of age who were recruited for a laboratory-based study of physiological responses to social stress. Relevant to the current study, participants reported on their use of different forms of relational aggression (alphas >.83; Little, Henrich, Jones, & Hawley, 2003), their parents’ use of various forms of psychological control (alphas > .69; Nelson, Yang, Coyne, Olsen, & Hart, 2013), and their angry and anxious rejection sensitivity (alphas > .76; Ayduk, Mendoza-Denton, Mischel, Downey, Peake, & Rodriguez, 2000).

Correlational analyses revealed that angry rejection sensitivity was correlated with reactive relational aggression (r = .25, p < .05). Child-reported love withdrawal was also related to instrumental (r = .27, p < .05) and pure (r = .28, p < .05) forms of relational aggression. However, mediational analyses, using PROCESS (Hayes, 2013), did not support the hypothesis that rejection sensitivity mediated the relation between forms of parental psychological control and forms of relational aggression. In contrast, there was evidence that parental psychological control interacted with rejection sensitivity in predicting relational aggression. Angry rejection sensitivity and parent love withdrawal interacted in the prediction of reactive relational aggression such that for youth low and average in rejection sensitivity love withdrawal was positively associated with relational aggression (low RS b = .43, p < .01; average RS b = .17, p < .05). A similar pattern emerged for the interaction between child-reported guilt induction and rejection sensitivity. For youth high in rejection sensitivity there was not a significant relation between parental guilt induction and relational aggression, but for youth average or low in rejection sensitivity there was a positive relation between parental guilt induction and reactive relational aggression (low RS b = .40, p < .01; average RS b = .20, p < .05).

Results suggest that angry rejection sensitivity is positively related to reactive relational aggression but that parental PC may also model relational aggression for youth, even if sensitivity to rejection is low. Thus, it seems that both schema and parental psychological control are important for understanding why some youth are more relationally aggressive than others.
Abstract:

Research has shown that phonetic similarities between words pose issues for children learning new vocabulary (Swingley & Aslin, 2006). It appears obvious that a person must identify a newly-encountered word as distinct from an already-known word in order to recognize a new addition to his or her lexicon; however, current research has yet to quantify just how different two words must be in order for the listener to recognize them as two distinct words. In this study, I set out to determine how different two words have to sound for adults to believe they are "different". I hypothesized that, as words progress along a continuum of low sound-similarity to high sound-similarity, they become more difficult to judge as different. To test this hypothesis, I conducted word judgment tasks, presenting word pairs distributed evenly along a continuum of sound-similarity. Each task consisted of 28 trials, with possible word combinations totaling 812. In each trial, undergraduate participants (N=29) were sequentially presented with two digitized images of novel objects paired with two novel words. Participants were then asked to identify one of the objects. For example, participants in a high-similarity trial first saw an oblong, blue object labeled as a "VIM". Next they saw a round, purple object and were asked to identify the "FIM". Responses were captured on a touchscreen laptop using SuperLab, a computerized stimulus-presentation platform. Overall, results of the study confirm that adults are very accurate when judging whether two words are the same or different; accuracy was nearly 100% across trials in this study. However, reaction time across trial conditions differed depending on degree of similarity; judgments were slower when two words were very similar in sound and faster when two words were dissimilar in sound. The progressive increase in reaction time corresponding to low- and high-similarity words suggests that judgments of novel words make significant cognitive demands on adults. Due to less advanced cognitive skills and overall development, children may have slower reaction times and be less accurate on word judgment tasks compared with adults, potentially impacting their lexical development. Future studies will specifically address children's word judgments, determining the differences (if any) between children's and adults' performance on word judgment tasks and ultimately examining the relationship between contrasting word judgments and early vocabulary development.
Student Presenter: Emily Passmore, Amanda White, Jakeias McGee, Daniel Zhang, Curren Shah

Title: Socio-Economic Impact of Non-Profits in West Alabama

Abstract:

Justification: The Business Honors Non-profit analysis study gives the team members insight on the surrounding community and the impact that Non-profit organizations have on it. In addition, the research provides real-life, business experience that supports the variety of business majors found within the team.

Purpose: How do non-profits affect the surrounding community? The purpose of this research is to find a numerical and social value on how non-profits impact their community.

Innovation: The research of non-profits is an innovative study as it changes the way non-profits write their request for proposals. Traditionally, many non-profits must rely on pathological reasoning to write their grant application. However, there has been a shift in society where concrete data are a better justification to support their request. As a result, by studying the economic and social impacts of non-profits, we can produce the numbers that they need to develop a request for proposal based on research.

Method: The participants of this research are Amanda White, Cory Myers, Curren Shah, Daniel Zhang, Emily Passmore, Austin George, and Jakeias McGee. We met with the head of the non-profit council of West-Alabama who introduced us to several non-profits in the area. Next, we reached out to the leaders of the non-profits, developed relationships, and obtained financial reports/data from these non-profits. Then we used a software called IMPLAN, an input-output modeling program, to analyze these financial statements.

Conclusion: As a work in progress, there is no current results to base the research off of. However, looking forward, we plan on analyzing the numbers that ImPlan has provided us so we can identify the direct and indirect economic impact that a non-profit has on its surrounding communities. In addition, we are looking into a concept called social return on investment to identify the non-economic value of non-profits. By tying together the economic and social value of non-profits, we can reveal their importance to the community and provide them opportunities to expand.
Abstract:

Research has shown that certain intervention strategies can be effective in reducing substance misuse in adolescents. For example, family-based intervention programs addressing future orientation (i.e., focusing on future goals) have proven viable. However, there is a lack of research regarding peer/friendship group intervention methods that target future orientation. The purpose of this study was to (1) examine characteristics of peer groups that engage in elevated levels of substance misuse and (2) propose a peer group intervention method as a mechanism to develop a positive future orientation in these adolescent peer groups. According to data collected from this study, individuals in high-drinking peer groups reported lower levels of maturity and goal orientation than those in low-drinking peer groups. The results of this study encourage further research on peer group intervention strategies and suggest a focus on future orientation in these peer group interventions.
Session 1: 8:30-10:00 | Education; Social Sciences  
Category 1: Work in Progress  
Poster Number: 52

Student Presenter: Alexandria Perry  
Title: Influences of competence and response latency on judgments of awkwardness and veracity

Abstract:
Interpersonal conversations filled with interruptions and pauses can result in unstable moments...sometimes awkwardly silent. The purpose of this quantitative research study is to explore nonverbal communication and how pausing in conversation, known as response latency, can influence perceptions of social awkwardness. Response latency and communication competence (i.e., one's ability to navigate difference social situations effectively) will serve as the independent variables while social awkwardness and judgments of veracity will serve as the dependent variables. Guided by the theoretical framework of expectancy violations theory, this study examines how changes in response latency (from short to long pausing) may violate social norms and drive conversational fluency. This study relies on an experimental design where we will first record the audio of an interpersonal conversation surrounding a simple topic such as, "How were your classes today?" Once recorded, the extracted audio will be edited using software to create three separate recordings consisting of a conversation where the response latency between pauses in conversation are split into half, doubled in time, and a control condition with an unedited version. Finally, participants will be randomly assigned one of the conditions and will listen to the conversation. Participants will rate their perception of the social conversational meaning through several measures/scales (i.e., awkwardness & veracity). Lastly, participants will report demographics and complete a communication competence scale, which will serve as an addition independent variable for analyses. The results will be central in analyzing both the causes and effects of response latency on socially awkward situations as well as provide insight on how to recover from awkward conversational encounters and improve communication competence during conversation.
Abstract:

Interactions between individuals via technology tend to rely on many of the same nonverbal communication and power display techniques found in face-to-face interactions. By researching the effectiveness of nonverbal power displays through mediated channels, such as online photos, we can learn about user generated images in the communicative process. The goal of this study is to examine nonverbal power displays in online profile photos to reflect the power people possess professionally. A specific example of how power and prestige can be displayed via online images is through the photos professors post on their online profiles. Does the power they wield in their university correlate in some way with their photo choice? This study defines power using Max Weber’s theory on power as the ability to achieve goals without the support of others (see Wallimann, 1977). This combined with the theory of casual power, reveals that individuals seek to understand social power dynamics in their exchanges with others (Cheng, 1997). Might these lens be applied to the academic social hierarchy? Power, in this study, is operationalized based on the position the professor holds at their University. The book Tied Knowledge: Power in Higher Education, explains the varying levels of rank in academia. The highest amount of power, or rank, a professor can hold in their department is in the position of department head/chair. Below the head of department are full professors, associate professors, assistant professors. Other individuals help with the mission of teaching as lecturers, adjunct instructors, and graduate teaching assistants (Martin, 1998). In this study, student participants will respond to a two-part Qualtrics survey through the participant pool in their college. Part one of the experiment displays a professor’s profile photo taken randomly from a collection of 3,888 Communication Studies professors who published research between 2012-2016 in 24 core communication journals. Next, participants will then be asked to rank the professor based on a semantic-differential rating scale of nonverbal power (Dunbar, 2000). This is repeated with two separate randomized professor’s photos. Part two of the experiment displays two randomized photos adjacent to each other and participants will be asked to indicate which professor has more power (prestige) and explain why they perceive that professor as more powerful. Data will then be compared to the actual rank a professor holds in their university, and their Google H-index (research score) and analyzed for comparative trends/relationships. The study’s anticipated results should reveal how professors are able to convey power nonverbally online, and how students perceive nonverbal power of professors when viewing their online photos.
Abstract:

Justification: This study investigates the effect playing digital games can have on improving spatial and mathematical skills. Studies have shown that mathematical literacy at an early age is critical primarily because it predicts greater future academic success regardless of other factors such as socioeconomic status, cognitive ability, and demographics. Specifically, this study seeks to analyze whether playing spatial games can serve as an effective means of improving spatial skills, which in turn may enhance mathematical reasoning skills.

Purpose: The purpose of this study is twofold: 1) Does playing a spatial videogame improve spatial skills? 2) Is there a gender difference in the amount of improvement? Because this was a pilot study about whether playing a spatial game increases spatial ability, no math test was included.

Method: There were 46 participants (50% female/50% male) in this study. The participants were undergraduate students recruited through the Psychology department, and students 18 years of age or older from any ethnic background. The game is entitled Echochrome and is designed for the PlayStation 3 game console. The game requires manipulation of a virtual course, utilization of mental visualization, and rotation of what is meant to be a three-dimensional object portrayed two-dimensional medium. Before playing the game, participants completed a battery of tests such as: Guay's Visualization of Viewpoints, Mental Rotations Test, and a Spatial Reasoning Instrument. Next, students completed a game tutorial and then were asked to complete as many levels as possible in either a 30 or 60-minute time limit. After, participants once again completed the multiple spatial abilities tests.

Results: We found that training improved performance for one spatial skill (Guay Visualization, GV) but not the other (Mental Rotation, MR). Also, males performing better than females on one spatial skill (GV) but females performed better than males on the other spatial skill (MR). Females did not improve significantly better than males on either task. Further, Level of participation in active pass-times was positively correlated with GV but negatively correlated with MR. Finally, whether participants played video games was related to higher levels of GV but lower levels of MR.

Conclusion: Based off the data collected, We found that the Echochrome activity affected some aspects of a person's spatial abilities. The participants were shown to significantly improve on the Guay's Visualization test after completing the game task, indicating a correlation. These results suggest the two tests, Mental Rotation and Guays, may examine different aspects spatial ability; with the game improving one of these aspects. Regarding gender, one sex did not show more substantial improvement than the other after completing the trial. For both the pre and post sections, males performed better than females on Guay's Visualization of Viewpoints. However, females outperformed males in Mental Rotations. Also, the data showed no
improvement in performance on Guay's Visualization with subjects do/ don't play video games, which may indicate video games don't use of the same spatial ability required for the Mental Rotations test.
Abstract:

Emotion shapes cognitive processes involved in memory. But does emotion influence what we remember? Research has proposed that the motivational intensity of emotion plays a role in how memory is affected, by either broadening or narrowing cognitive scope. More specifically, the motivational intensity model predicts that emotions low in motivational intensity broaden cognitive scope, while emotions high in motivational intensity narrow cognitive scope. The present research was intended to examine how negative affects both high in motivational intensity and low in motivational intensity influenced memory for centrally or peripherally presented information. Experiment 1 found that threat, a negative affect high in motivational intensity, enhanced memory for centrally presented information. Meanwhile, Experiment 2 results found that sadness, a negative affect low in motivational intensity, enhanced memory for peripherally presented information. Experiment 3 directly compared the effects of threat and sadness, finding that threat narrowed scope of memory and sadness broadened scope of memory. The results of these experiments provides support for the motivational dimensional model of cognitive scope, which posits that high intensity emotions narrow cognitive scope, while low intensity emotions broaden cognitive scope.
Abstract:

Body modification has been in practice for thousands of years, and its prevalence in mainstream culture has only increased in recent decades due in part to more hygienic practices. While there have been previous studies on the prevalence of body piercing and tattooing in undergraduate populations, these studies are dated and small leading to questionable relation to broader populations. In this study, we looked at the prevalence of tattoos and piercings, as well as complications from these modifications, in a national and undergraduate sample. The survey was designed in Qualtrics and distributed online via email, Facebook, and Instagram. In the national survey, there were 700 responses, while the undergraduate sample garnered more than 6,000 responses. Around half of the participants in both surveys reported having a tattoo, and while there weren’t statistical differences in prevalence between the two samples, there was a significant correlation between undergraduate varsity athletes and low complication rates. Undergraduate varsity athletes had significantly lower complications in both piercings and tattoos while having the same prevalence compared to a general undergraduate population, which we believe is due to their elite fitness. Future studies will aim to examine possible causes for this discrepancy, such as the ways in which these varsity athletes care for their bodies before and after receiving body modifications and if these tattoos are a marker of their elite fitness.
Session 1: 8:30-10:00 | Education; Social Sciences
Category 1: Work in Progress
Poster Number: 1

Student Presenter: Samuel Reece, Riley Raynor, Will Henson
Title: LAMP

Abstract:

Not Publishable
Abstract:

Autism is a spectrum of developmental disorders associated with difficulties in social-interaction and communication. Previous studies have shown that autism is characterized by unique patterns of brain function and structure. My project follows up on previous neuroscience studies on autism and focuses on identifying structural brain features differentiating high individuals with autism and standard functioning individuals. This study used structural MRI data from the National Institute of Mental Health. The participants include 20 individuals in the autism group and 20 typical individuals in the control group (ages 7-12). The participants in each group were matched for age, parent socioeconomic status, and education. The analysis focused on comparison of grey matter volume, grey matter density, gyrification, white matter volume, and white matter density. Identification of structural features of autism can help us understand neural and developmental mechanisms underlying autism and provide insight into venues for better education for individuals with high functioning autism.
Student Presenter: Annebel Roberson
Title: A survey of the thoughts and attitudes of music faculty and staff towards music therapy

Abstract:

Background: Though surveys in the music therapy literature have been conducted to evaluate thoughts and attitudes towards a professional music therapy program (Hughes, Robbins, & King, 1988) no surveys have been conducted to evaluate the thoughts and attitudes of music faculty and staff towards a university's music therapy program. Similarly, although surveys have been conducted to evaluate the thoughts and attitudes of students towards a university's music therapy program (Clark & Krantz, 1996), no surveys have been conducted to evaluate music faculty's attitudes toward these programs. Surveys investigating these thoughts and attitudes provide important information about ways to improve collegiate music therapy programs and reveal potential advocacy opportunities within schools of music.

Objective: The objective of this survey was to evaluate the knowledge, thoughts, and attitudes of the music faculty and staff at the University of Alabama (UA) towards music therapy both as a whole and as a specific program at the UA for the purpose of identifying potential advocacy opportunities within the School of Music. This survey answered the questions "What do UA music faculty and staff know and think about the profession of music therapy?" and "What do UA music faculty and staff know and think about the music therapy program at UA?"

Method: A Qualtrics survey was distributed via email to all members of UA music faculty and staff (N=22). The survey included questions prompting respondents to rate their agreement with statements about music therapy on a Likert scale as well as free response questions prompting respondents to provide an overview of their knowledge and opinions toward music therapy. Participants were given approximately one month to return the survey and were emailed one week before the survey closed with an additional invitation to participate.

Results: A total of 56 surveys were sent out, with one survey returned due to outdated contact information; 22 completed surveys (39.2% response rate) were analyzed. Most respondents (86.4%) expressed positive attitudes towards the music therapy program at UA in free responses. Only 13.6% of respondents said that music therapy was evidence-based, and only 23% of respondents mentioned board certification at any point during the survey. While 64% mentioned clinical work when asked about their knowledge of the music therapy program at UA, only 32% mentioned completion of a recital, another required part of the degree program.

Conclusion: Although music faculty and staff at UA have a positive view of music therapy both as a whole and as a program at UA, there is a clear need for education and advocacy about what music therapy is and what professional music therapists do. Negative comments about the music therapy program came only from studio faculty, indicating a need for more open dialogue between the music therapy department and the studio faculty. It is recommended that similar studies be replicated at other universities to identify advocacy opportunities both regionally and nationally.
Abstract:

The term "friend" on social media can have a different meaning than the term "friend" that is used in everyday life. The classic definition of friendship, as Hays writes, is the "voluntary interdependence between two persons over time, which is intended to facilitate the socio-emotional goals of the participants and may involve varying types and degrees of companionship, intimacy, affection, and mutual assistance" (1988, p. 395). This is where the term "best friend" and "close friend" are differentiated. A "best friend" is someone that is always there to talk to and spend time with; A "close friend" is someone you are compatible with and who is also there, but they aren't around as often (Lopes et al., 2015). However, sometimes these friendships dissolve as Casper and Card (2010) found. To extend this work, we examined antipathetic relationships that emerged from broken friendships and compared former "best" friends to "close" friends and whether they stayed friends on social media after the friendship ended. We hypothesized that previous best friends were more likely to stay friends on social media who were incompatible than close friends. We also hypothesized that those who were not friends on social media were not because of aggression and intimacy rule violations. With a sample of primarily Caucasian (83.6%), female (88%) college students (n = 286; M age = 20 years), we examined the reasons that led to the transformation among former "best" friends (n = 175) and former "close" friends (n = 111). Method: We coded 286 narrative responses to the question of what led to the transformation, using Casper and Card's themes (e.g., aggression, jealousy, incompatibility, and intimacy rule violations) as a guide. Next we examined the frequency of remaining friends on social media (or not) for each transformation reason. Results: We found that out of 157 best friends, 74% are friends on social media. Out of 106 close friends, we found that 78% are friends on social media. Incompatibility was the leading cause of a friendship emerging into an antipathy with 52% of best friends and 53% of close friends reporting incidents of an incompatible friendship. 77% of incompatible best friends and 88% of incompatible close friends stayed friends on social media. Out of the participants that said they do not have their former friend on social media, 47% reported that aggression or intimacy rule violations were the reasons why. Discussion and Future Research: I think the friendships that ended in an incompatibility were more likely to remain friends on social media because it didn't necessarily end in an extremely negative way. It makes sense that the majority of those that did not keep their former friends on social media was because of an offense such as aggression or rule violation. In the future, I would like to know more about antipathies between males since many of the participants in this study were females. It would be interesting to further research with a more diverse group.
Student Presenter: Brianna Rychlec
Title: Impact of Socioeconomic Status on the Perception of Autism Spectrum Disorder

Abstract:

The purpose of this study is to better understand the overall prevalence of stigmas associated with autism spectrum disorder (ASD) and socioeconomic status present in college-age individuals, and to determine if the stigmas related to socioeconomic status differ and/or impact the stigmas associated with ASD. This study aims to assess college students' perceptions of socioeconomic status and autism spectrum disorder, so professionals and educators can begin seeking ways to minimize these stigmas, therefore minimizing negative effects individuals with different diagnoses and/or lower SES endure. Thus far, little research has been done to study both autism spectrum disorder and socioeconomic status. A Qualtrics survey was created and will be given to participants over the age of 18 years on a college campus. Each individual will read one of four brief vignettes about a college-aged male. Participants will then complete a series of ratings across several personality dimensions about the individual described in the vignette. At the end of the survey, they will answer questions providing information about themselves such as their gender, age, major, their parent's highest degree earned, to rate their familiarity with ASD, and their knowledge of treatment for ASD. 100 to 200 participants will participate in this study. The data collected from the survey will compare autism spectrum disorder stigmas to socioeconomic status stigmas, to determine if one impacts the other. For each of the 12 outcomes, a regression model will be created including the SES status of the individual described in the vignette, ASD vs. typical developing vignette character, and gender of the participant. Other variables of interest to be included in the model include the age of the participant, area of study of the participant, knowledge of ASD, and parent’s highest degree earned. Interactions between variables will be considered as well. The results are expected to determine if college students perceive individuals with ASD and/or individuals with lower socioeconomic status more negatively.
Abstract:

Social media is used as a primary way for college students to communicate and stay connected with other people. Perrin (2015) found that approximately 90% of young adults use social media as a way to connect with other people online. On the other hand, Underwood and Faris (2015) found that majority of adolescents spend more time on social media lurking than actively interacting with other people. Online lurking is often defined as reading or viewing content posted online without actively posting a status or interacting with others on the social media platform (Underwood & Ehrenreich, 2017; Frison & Eggermont, 2016; Antheunis, Valkenburg, & Peter, 2010). The present study seeks to understand college students' lurking behavior regarding who they look at, on what platforms, and for how long. Even further, this study examines the novel behavior of lurking on a former friend. That is, someone who was, but is no longer a friend in real life, but is still a "friend" on social media. The study examined an ethnically diverse (15.0% African American, 75.9% Caucasian, 2.4% Hispanic, 2.1% Asian, 1.0% American Indian or Alaskan Native, 3.5 other) sample of undergraduates (N= 286, 8.0% males; 90.9% females, mean age = 20.1 years). Generally, a little over half of participants (65%) first view their best friend on social media, approximately 86% of the participants look at their friends social media, approximately 20% of participants look at their former friends social media, and approximately 25% of people look at their former romantic partner. The majority of college students reported (N=166; 95% female) that they are still friends with their former friend on social media. Of those (N=99) who were still friends with their former friend (FF) on Facebook (FB), 32% of looked at their FF's profile at least once a week. On average, when people lurked on their FF on FB, they lurked for approximately 6 minutes (M=6.36). Of those who were still friends with their FF's on Twitter (N=35), approximately 34% looked at their FF profile at least one a week. On average, when people lurked on their FF's Twitter, they lurked for approximately 5 minutes (M=4.92). Of the people who were still friends with their FF's on Instagram (N=104), approximately 29% looked at their FF's Instagram profile at least once a week. On average when people lurked on their FF's Instagram page, they lurked for approximately 5 minutes (M=5.38). Of those who were still friends with their FF on snapchat (N=77), 58.44% looked at their FF's story every time a story was posted (N=45). We found that majority of people are still friends or following their FF on social media, even though they are not friends in real life. Further analysis showed that some of these individuals are consistently lurking on their FF. Future research should look into understanding why young adults remain friends on social media with their FF and the impact lurking has on young adults.
Abstract:

Coffee is known as a caffeinated beverage that can make or break the day of a student on a college campus; however, coffee is not simply chosen because of its caffeinated quality. In fact, this is the least notable factor in regarding selection of the nationwide chain coffee shop, Starbucks, over other competitors at the University of Alabama. Through weeks of participant observation and interviews, three themes arose that explain the utilization of Starbucks: atmosphere, location, and capitalist consumerism. It is ascertained that Starbucks produces its own cultural model that compiles these three items to cultivate the highest revenue and customer satisfaction.
Abstract:

Study Objective: The primary aim of the current study is to identify factors related to opioid use among college students.

Summary of Previous Literature: Over 100 people die every day in the United States due to opioid use and misuse, a nationwide epidemic that affects young adults. Understanding the development of behaviors associated with opioid use on a college campus is imperative.

Methods: Participants were contacted via email through a list serve created by the University registrar during the Spring semester 2018. All data were collected anonymously using the University of Alabama Qualtrics survey platform. Basic demographic information (age, ethnicity/race, gender, height and weight) were self reported. Physical activity was assessed using the short version of the International Physical Activity Questionnaire (IPAQ), and reported as minutes per day spent engaged in light physical activity (LPA), moderate-vigorous physical activity (MVPA), and sedentary behaviors. Sleep quality and duration were assessed using the Pittsburgh Sleep Quality Index (PSQI). Overall health, as well as overall physical health were each assessed using a single item question and a 5-point Likert scale. Participants were asked to report the frequency of their opioid and substance use, and then were categorized as users and non-users. Potential differences between each group were assessed using a chi-square test (categorical variables) and using independent samples t-tests (continuous variables). All data are presented as a mean and standard deviation unless otherwise indicated. Statistical significance was assessed with an alpha level of 0.05.

Results: A total of 2,155 participants took part in this study (20.1±1.8 years, 66.8% female, 88.9% Caucasian, 6.2% African-American). No gender-related differences were noted among participants when comparing the prevalence of opioid use (p=.912). However, female participants were more likely to report heavy opioid use (40+ times in the previous 12 months) when compared to their male peers (p=.037). In addition, no differences were observed between opioid users and non-users when examining sleep duration, MVPA, sleep quality, overall health, overall physical health (all p>.05). Interestingly, students who reported opioid use also reported 9.6% more LPA (p=.019).

Conclusions: Future studies should examine these differences with objectively measured physical activity and a more diverse sample of participants. Targeted public health interventions should be focused on opioid use in female students.
Limitations: This study is potentially limited due to the cross-sectional nature of the study design. In addition, all outcomes measured in the study were self-reported. The sample was predominately female and Caucasian, which may limit our ability to generalize the study results to other demographic groups.
Student Presenter: Nisha Singh
Title: The interaction between aggression and self esteem in the experience of peer victimization during adolescence

Abstract:
More than one out of every five school-age children report being victimized, or bullied, within the past year (Finkelhor, Ormrod, Turner, & Hamby, 2005). The proposed study examines two risk factors for peer victimization - aggression and low self-esteem. School-age children who are high in aggression are at risk of being victimized by their peers (Putallaz, Grimes, Foster, & Kupersmidt, 2007). Those with low self-esteem are also at risk (Tsaousis, 2016). Both of these risk factors presumably affect children's relationships with their peers. Although aggression and low self-esteem have been identified as risk factors, little is known about the effect that the interaction between aggression and self-esteem may have on peer victimization. It is hypothesized that the interaction between high aggression and low self-esteem will have a much greater impact on one's victimization experience than each of them separately. 20-30 middle-schoolers (and their parents) will be asked to complete three separate questionnaires to assess their levels of victimization, aggression, and self-esteem. These levels and data will be analyzed using a 2 x 2 ANOVA to understand whether or not there is a significant interaction between self-esteem and aggression on victimization. Using this data, educators and counselors will be able to develop better strategies for dealing with victimization.
Abstract:

Background: Retirement is supposed to be a pleasurable time in which people can reap the benefits of their hard work (Falba, Gallo, & Sindelar, 2008). The average retirement age for men is 64 and for women is 62 (Munnell, 2011). However, missed expectations about retirement might result in working when one planned to enjoy retirement. This unexpected working might cause stress, most likely attributed to the disappointment in postponing pleasant activities that were planned for retirement (Falba et al., 2008). Previous literature has been documented that 62-year-old full-time workers, who expected not to be working full time, suffer from depression (Falba et al., 2008). However, individuals might have to work longer than they planned when facing an unforeseen negative shock to assets, such as recent stock market fluctuations and financial problems resulting from inadequate planning for retirement (McFall, 2011).

Objectives: The current study investigated whether full-time working status impacts mental health of older adults in the United States, as well as whether race/ethnicity moderates the relationship between full-time working status and mental health. Specifically, we investigated whether full-time aging workers suffer from depression at a higher rate than retirees after controlling for chronic health conditions and demographic and socioeconomic characteristics.

Methods: This study used a publicly available nationally representative longitudinal dataset drawn from the 2014 wave of the Health and Retirement Study (HRS), consisting of residents older than 50 years within the United States. The HRS is sponsored by the National Institute of Aging. We analyzed a total of 7,327 adults aged 65 and older using multilevel logistic regression.

Results: Overall, this study found that employment status was significantly associated with depressive symptoms among older adults in United States. As compared to retirees, full-time aging workers reported less depressive symptoms. Chronic illness also contributed to worsening mental health. In particular, ever having a high blood pressure, lung disease, heart problems, psych problems, and arthritis were associated with increased depressive symptoms. In terms of racial/ethnic differences, being a Hispanic was significantly associated with increased depressive symptoms. On the other hand, being older, having a higher education attainment, and having a higher levels of household wealth were associated with decreased depressive symptoms. We also found an interaction effect of race/ethnicity on the relationship between full-time working status and mental health.

Discussion and Implications: This study may provide a basis for further research to discover methods to decrease the number of individuals with depression, through either social activities and interaction or through health programs. Future research might build on our model and expand it to provide more comprehensive approaches to reduce barriers and to create more access to help from mental health professionals in both workplace and communities. Furthermore, this study may provide implications for more effective interventions for depression across specific chronic illness, age, gender, and race/ethnicity groups. The interaction effect between full-time working status and race/ethnicity on mental health may be highlighted to researchers, policymakers, and healthcare professionals.
Abstract:

The purpose of this research is to identify key communication functions that play a role in the acquisition of success in the sports management field. In this research, there are five different categories covered that are associated with sports management. Five categories that require a high level of proficiency and knowledge of such in order to acquire said success. Also, these five categories all share three communication functions, where the perception, reception, and application of each are required in order to obtain success in the sports management field. The categories that the research is based on are, first, the interdisciplinary nature of sports management. Second, the judgement of fundamental legal concepts relevant to tort, contract, and constitutional law that apply to sports management. The third, fourth, and fifth categories are marketing concepts and consumer behavior, financial strategies, and advanced concepts of leadership. The goal is to show that by effectively communicating the three functions, adaptation, deception, and leadership, one could acquire success in the sports management field. This will be done by completing a review of literature and comparing the experiences of successful individuals in the sports industry and those who are communication experts. All of which have insight into one or more of the aforementioned five categories that this research is based off of. The research will primarily be done through a review of literature, but it will be also will use a social scientific approach due to the focus on society, relationships, and interpersonal relationships. This will be done to understand reasoning behind human behaviors. This research will also be an informal assessment, as it is content and performance driven. After analyzing the literary work and comparing the experiences of communication experts and successful individuals in the sports management field, I'm proposing that it will be evident that adaptation, deception, and leadership are communication functions who play an important role in the acquisition of success in sports management. I am also proposing that it is clear that the ability to perceive and display each function, adaption, deception, and leadership effectively, play a significant role in the acquisition of success in sports management. By showing this, the research will hopefully highlight important communication functions that play a role in the acquisition of success in sports management. This study will hopefully also shed light on how to become a primetime performer in one of the world's most profitable professions. In the past five years the global sports market went from accumulating 76.1 billion dollars a year in 2013 to 90.9 billion dollars a year in 2017.
Abstract:

A successful individual can generally describe another individual that has influenced, supported, and critiqued them into a better version of themselves; a mentor. A successful individual can also generally describe another individual that is reliable, attentive, and honest when asking for advice; a friend. In order to succeed, people need to be encouraged by someone that ultimately builds their character, confidence, and intelligence. This can be achieved through peer facilitation. In nursing, it is vital to communicate with peers in order to fully understand content, enhance skills, performance and development. This project aims to explore ways peer facilitation can impact nursing students through their education and future careers. Ultimately, this project will utilize peer facilitation to increase the scores of students, confidence level, and skill level. It is the goal of this project to determine the benefits of peer facilitation in nursing education so that every student graduates a confident, prepared, intellectual nurse.
Student Presenter: Kailey Sonricker
Title: Gender Impact on Executive Level Promotion (subject to change)

Abstract:

Not Publishable
Abstract:

Fire is an integral part of human development and evolution. In fact, sitting around a fire may have helped our ancestors with group cohesiveness and prosocial behavior by providing a relaxing place for people to consistently interact. It is even hypothesized that human language evolved around the fire. Therefore, this study tested how fire affects participants' relaxation levels under varying conditions. To test relaxation levels, participants' skin conductance and heart rate were recorded while they watched a picture of a fire, a video of a fire, an upside down fire, and a blank screen with and without sounds. Demographic and personality questions were also collected to determine if there were any covariates affecting participants' responses to the fire, such as susceptibility to absorbance and sociability. Our results show that fire did cause participants to be more relaxed, which supports our main hypothesis. Additionally, those that scored higher in sociability also had lower systolic blood pressures, which supports the idea that the fire was an important area for social interaction and group bonding.
Student Presenter: Alexandra Stanley
Title: Enhancing Prognosis Communication through an Interprofessional Guide: A Feasibility Study

Abstract:

Justification: Communication is critical to caring for patients with terminal illness. Communication standards are outlined by the American College of Physicians (2014) through their High Value Care initiative communication guide. The communication guide offers enhanced communication about serious illness, but it falls short in that it lacks an interprofessional perspective.

Purpose: The purpose of this feasibility study was to test the efficacy of an interprofessional communication guide for discussing the prognosis and treatment of patients with terminal cancer.

Method: The study comprised of patients 18 years or older who were diagnosed with incurable cancer. A pre-test and post-test design was implemented. For the pre-test, prior to their first appointment with the oncology team, participants completed a 14-item survey regarding patient perceptions on chance of cure, information about prognosis, goals of care, treatment information preferences, and satisfaction with quality of information provided. The first question of the survey asked patient requests for prognostic information (none, some, all); the communication guide, developed for this study, was utilized with patients wanting some or all prognostic information (following informed consent). The communication guide was composed of multiple choice and open-ended questions that pertained to diagnosis, type of treatment, treatment goals, likelihood of cure, and life expectancy with and without treatment. During the patient visit with the healthcare team, all items on the communication guide were completed in an attempt to provide transparent communication. The post-test was completed at the six week follow-up visit. At this time, patients completed a survey and filled out the communication guide.

Result: Data analysis compared reported information between the two communication guides to assess accuracy in recall. Similarities in answers indicated that the information was communicated in a way that the patient could understand and remember, while differences in answers indicated the patient needed further clarification. A total of sixteen patients were recruited into this study, and only three of the sixteen completed all measures. All sixteen wanted at least some information about their prognosis, meaning the communication guide was used with all participants. Analysis of the communication guide's benefit for information retention was extremely limited due to a poor follow-up response rate. Only three patients completed the post survey results, but there was indication that the guide may be helpful for retaining prognosis information. A larger sample size is needed to confirm. The low response rate was helpful in highlighting a need for refining the procedures in future research, particularly in changing survey modalities from paper to electronic surveys.

Conclusion: The communication guide is a promising tool for interprofessional teams to effectively communicate information regarding prognosis. Revisions to the study have been proposed and will be integrated into a larger pilot study. Future, larger scale studies with these revisions will facilitate assessment of the impact of the communication guide on patients' information retention.
Student Presenter: Elizabeth (Ashley) Stinson, Melissa Sharpe
Title: Examining Limitations in Substance Use Treatment and Recovery Outcomes in Rural vs Urban Communities Across the United States

Abstract:
Evidence from the literature suggests that barriers to substance use treatment may differ in rural versus urban communities. This may result in health disparities by limiting the availability and utilization of treatment options and the potential for positive recovery outcomes. The aim of this study was to evaluate how substance abuse services and recovery-related outcomes (e.g., quality of life) may differ in rural and urban locations across the United States. Using Amazon Mechanical Turk, over 1700 adults from across the United States participated in the current study, and 510 of these participants met DSM-V criteria for a moderate to severe substance use disorder in the last 12 months. Participants voluntarily filled out an online questionnaire assessing qualifications for DSM-V substance use disorder criteria (mild, moderate, and severe), utilization of various treatment options, quality of life, spiritual health, and adaptive family functioning. Results from this study show that the utilization of treatment services may differ in rural versus urban communities. These findings support the need for additional treatment options in rural communities to provide a more comprehensive form of treatment and care.
Abstract:
There is a growing consensus that students who will be entering the workforce need to demonstrate similar proficiency in academics and skills as those entering college (ACT, 2006; Alliance for Excellent Education, 2009; Educational Policy Improvement Center, 2009). The necessity of higher education and professional development are evident constituents to the elevation of students socioeconomically; however, students apart of underserved populations, such as minorities, low-income children, or persons with disabilities tend to be disproportionately ill-equipped to handle the college decision-making process. Given this information, the College and Career Readiness Initiative is designed to make vital information regarding the collegiate process and the professional world accessible to the sophomore and junior students of Marion High School. Such a program would involve examining résumé construction, approach to scholarships, filling out a college application, forms of higher education that tailor to each student’s aspirations, amongst other things. Using an in-class small-group setting, specialized pamphlets, daily lectures and interactive activities, such as mock interviews, campus tours, and interaction with scholarship and college information databases, each student should receive the necessary attention needed to fully grasp each aspect of the process.
Student Presenter: Emily Terry, Katherine Fallon  
Title: Impacts of Demographic Factors When Relating Personality Traits of Oppositional Defiant Disorder to Misconduct Problems Within Adolescents

Abstract:

Being one of the most commonly diagnosed pre-adolescent, behavioral disorder, Oppositional Defiant Disorder (ODD) has widely impacted society's youth. ODD has notably been classified as a Disruptive Behavior Disorder (DBD) and a brief overview of symptoms are as follows: severe patterns of deliberate disobedience, vindictiveness, hostility, and pessimistic attitude. The prevalence of ODD amongst the general population needs to be further analyzed. Specifically, the risk factors of predisposed personality traits related to this disorder and their subsequent negative behaviors need to be highlighted. This research will consider the relationship between these variables, and the preliminary roles that an adolescent's biological gender and socioeconomic status plays on this said relation. A questionnaire comprised of factors from personality traits of ODD listed in the DSM-IV will be administered to high school students, grades 9 through 12 to analyze correlations of ODD traits and misconduct in school. A background information assessment will also be given to each student for the purpose of comparing the background information to the data collected via questionnaire. The goal of this research is to highlight the risk factors of ODD and help schools and prevention centers provide proper interventions for those affected. As of now, there is limited literature on adolescent's affected by ODD and we hope to provide new information that can be used for educational and intervention based purposes.
Abstract:

Families who live in underserved areas and those in lower socioeconomic categories are at risk for later ASD diagnoses and limited access to reliable health information regarding ASD (Peacock & Lin, 2012). Efforts are needed to reduce these disparities and to engage families in their child’s developmental process (Mazurek et al., 2014). Given that the median household income in Alabama is $11,360 less than the median US household income and that the majority of Alabama counties are considered rural, Alabama families with children at risk for ASD may be particularly vulnerable. The Pickens County Autism Resource Group was developed to support and educate families regarding developmental, behavioral, and educational issues. The group will meet monthly for one year and partners rural families and community stakeholders with ASD specialists. Participating families completed the Family Empowerment Questionnaire (FEQ; Koren et al., 1992), a needs assessment, and a demographic form. Preliminary analysis based on 3 families revealed that families are confident in their family practices but lack confidence in their ability to navigate community services, to advocate for services, and to access reliable information regarding autism. Patterns of family responses based on the FEQ and needs assessment will be presented and implications for building a supportive community will be suggested.
Abstract:

The purpose of this study is to explore experiences of African-American and Black women in contemporary leadership positions. Standpoint Theory (Georg Wilhelm Friedrich Hegel, 1807) and Co-Cultural Communication Theory (Mark Orbe, 1996) are used to frame this project. This study is developed from a thematic, historical literature review of the previous research on the leadership development and leadership styles of women in America. This study uses qualitative interviews to critically understand the lived experiences of Black women in contemporary leadership roles as educational status, career attainment, media images and cultural expectations of Black women have shifted over the last two decades.
Abstract:

The purpose of this study is to explore the extent to which social media influences the relationship between hair and identity among African-American college women in the United States. This study consists of a thematic, historical literature review of the previous research on the relationship between hair and identity in African-American women as well as the collection and analysis of data from interviews conducted with 12 African-American female college students at the University of Alabama. Research related to the themes of resistance and liberation, hair and family, hair in the professional realm, hair and beauty, good hair versus bad hair, hair in the media, the impact of haircare practices on health, hair and identity, hair and community, and terminology used in relation to hair is discussed. This study is based on Cultural Identity Theory, Communication Theory of Identity, Cultural Negotiation Theory, and Cultural Contracts Theory. The results lead to three main conclusions: hair plays a large role in African-American college women's identity; factors such as family, friends, and environment play an important role; and social media's importance in relation to hair is minor.
Abstract:
Children with ADHD experience significantly higher levels of peer rejection than children without ADHD (Bagwell, Molina, Pelham & Hoza, 2001). In spite of this, studies show that children with ADHD positively inflate their social standing on self-report measures through a phenomenon known as the Positive Illusory Bias (PIB; Hoza, Pelham, Dobbs, Owens & Pillow, 2002). Four theoretical explanations have been proposed for this bias: cognitive immaturity, neuropsychological deficits, ignorance of incompetence, and the self-protective hypothesis (Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007). Each theory has both its merits and its limitations with perhaps the strongest evidence for the self-protective hypothesis, although some areas such as neuropsychological functioning remain largely untested. Further, Owens and colleagues (2007) noted that there is a great need for studies that directly compare the theories within the same study in order to examine the comparative strength of each theory.

The current study examined the moderating effects of positive parental feedback and neurocognitive functioning on the relationship between ADHD symptoms and PIB. Positive parental feedback was considered given that frequent praise from parents was expected to help reduce a self-protective tendency. Data were collected from a sample of 360 fourth-grade students from elementary schools in the southeastern United States. The sample was predominately male (65%) and African American (78.1%; 20.3% White and 1.4% Hispanic). A large battery of measures was completed by children, parents, teachers, and peers, including the Behavior Assessment System for Children (BASC), the Iowa Gambling Task (IGT), the Alabama Parenting Questionnaire (APQ), the Self-Perception Profile for Children (SPPC), and classroom sociometrics. It was predicted that neuropsychological functioning as indexed by overall net score performance on the IGT and positive parenting based on the APQ would serve to attenuate the relationship between ADHD symptoms and PIB.

To define PIB, a standardized difference score was created between social preference (i.e., the difference between peer "like most" and "like least" nominations) and self-reported peer acceptance as measured by the peer subscale on the SPPC. Correlational analyses revealed that teacher-reported BASC Attention Problems were significantly correlated with PIB ($r = .21$). A multiple moderator analysis was subsequently conducted via the PROCESS add-on module for SPSS. For the current analyses, neither moderator was significant in the analyses, suggesting that the relationship between ADHD symptoms and PIB was not affected by the degree of positive parenting or neurocognitive functioning.

Future studies should continue to explore potential mechanisms for better understanding the relations between ADHD symptoms and PIB as well the conditions under which the relationship is enhanced or attenuated. Future research should consider more objective measures of positive parenting (e.g., observational tasks) or praise from sources other than parents (e.g., peers). Finally, our study used a measure of neurocognitive functioning that likely taps into multiple processes (e.g., executive functioning, reward responsivity, etc.). Studies with more fine-grained and varied neurocognitive assessments may yield additional findings in the future.
Abstract:

Study Objective: The purpose of this evaluation at The University of Alabama School of Medicine is to improve the assessment of primary care medical residents (post-graduate medical trainees in specialty training with restricted licensure) in their four-week psychiatry rotation. This serves to improve the academic experience for residents, thereby strengthening their knowledge base and better preparing them for their future practices. This evaluation technique can help to target the teaching methods on relevant and important topics in psychiatry, which can create a more valuable learning experience for residents.

Summary of Previous Literature: Doctors, instructed to rate topics based on relevance to their current practice, report depression, alcohol misuse and drug misuse among the top relevant patient psychiatry needs (Wilson, 2007). Other questionnaires have been used to provide insight into determining topics for psychiatry medical training at multiple levels (Georg et al., 1999; Lyons, 2017). Current research focuses on psychiatry curriculum needs (Thornhill & Tong, 2006), and there is a growing need to assess psychiatry programs for medical residents.

Method: For the psychiatry rotation, medical residents are given a pretest to assess prior psychiatry knowledge. After the rotation, they then take a post-test, to assess learning. Each of these tests are scored and entered into the database. Topic categories (e.g. substance abuse, depression etc.) were assigned to individual questions and then questions were grouped by two expert raters. The level of difficulty and discrimination are analyzed for each question based on the scores. Outstanding and poor overall performances in categories are identified.

Results/Findings: About 25% of the psychiatric residency assessment focuses on pharmacology. Substance abuse is the next largest percentage. Residents tend to perform well on the pharmacology questions: most of the questions therefore scored low in difficulty and low in discrimination. When looking at performance across specialized categories, more residents tend to miss these questions on specific material such as a particular disorder. These more difficult questions appear to be application-based, rather than memory-based, such as most of the pharmacology questions. One interpretation of this assessment is that the psychiatry residency could benefit by focusing on diagnosis of specific disorders. A refocused curriculum may provide a more effective and efficient learning experience to medical residents in this rotation.

Conclusions/Discussions: This study is unique at the University of Alabama School of Medicine and includes some of the first steps in standardizing the psychiatry residency program. This is a longitudinal study, including test scores since 2013. By assessing the difficulty and discrimination of the questions involved, the implications of the results may change the process of teaching in the program. The assessment helps to identify if residents are receiving the knowledge that will best prepare them to succeed in future practices.

Study Limitations: The pre-tests and post-test are handwritten, leading to possible methodological concerns. With handwritten responses, the total number of responses and participants varied on some questions. Also, this assessment
is limited in generalizability as it is unique to the University of Alabama School of Medicine Psychiatry Residency Program.
Session 1: 8:30-10:00 | Education; Social Sciences
Category 1: Work in Progress
Poster Number: 67

Student Presenter: Zoë Whitmire
Title: The Role of Social Support and Mood in Association with Osteoarthritis Pain

Abstract:

Older adults with doctor-diagnosed osteoarthritis commonly suffer from osteoarthritis related pain. Pain is also strongly linked to depressive mood and the mood can worsen as the perceived pain level increases (Turk et al., 1992; Feldman et al., 1999; Ackerman & Stevens, 1989; Gaskin et al., 1992; Kerns et al., 1988; Linton & Gotestam, 1985; Summers et al., 1991). Previous studies (Jamison & Virts, 1990; Kucia et al., 1979) have shown that social support plays an important role in a person's perceived pain level. Similarly, previous studies (Cohen & Wills, 1985) have found that not receiving social support can also affect a person's mood in a negative manner. In this study, researchers have examined 340 African American and non-Hispanic White participants from two different geographical populations, ages 50 and older, with doctor-diagnosed osteoarthritis. The data was collected through an experience sampling method (ESM) of self-reports from the participant in order to capture in the moment data. ESM was chosen in order to remove the potential error associated with memory and recollection, and to have a more detailed data set. The data was collected through a week's worth (four calls per day for seven days) of baseline and follow up phone questionnaires where the researchers were able to gather the participants' social support (alone vs. with others), mood (positive and negative), and pain level data at the time of the call. The social support data was gathered through an open-ended question ("are you with anyone right now?"") and recorded on a two-point scale (alone vs. with others), while the mood and pain variables were both collected based on a 5-point scale (not at all=1-extremely=5). Mood was gathered through the question "how were you feeling just before I called" followed by 11 different moods based on the PGC Scale and the pain level data was based on one singular question rating the current level of perceived pain the participant is feeling. The researchers hypothesized that there would be a negative correlation between social support and perceived pain as well as a negative correlation between positive mood and perceived pain. From the current findings, there are significant effects of the call of day, positive aff (positive mood) and negative aff (negative mood) variables on pain. There is also a relationship between social support and pain happening in the moment of the call, however, no significant findings in the overall effects for the whole day. There was also no association between negative aff (negative mood) and social support (with others). In conclusion, the participants with a greater amount of social support are expected to have a more positive mood and less perceived pain.
Abstract:

Academic efficacy is a student’s confidence that he or she can achieve academically. A great deal of research indicates that academic efficacy is a better predictor of academic outcomes than academic performance. Academic efficacy is also a strong predictor of career-efficacy and career interests. While academic efficacy has been studied extensively, the developmental aspect of academic efficacy has been largely forgotten. This study tried to amend this gap by determining when and if students become subject-specific in their academic efficacy, as opposed to having a general academic efficacy that is similar across all subject areas. This study further investigated the relations between academic efficacy and career efficacy and career interest for two age groups. We examined these variables in 100 college students and 98 fifth grade students across four subjects: math, science, reading, and music. Participants were given a survey with academic efficacy questions (e.g., How good are you at math?), career-specific efficacy questions (e.g., How well do you think you could learn to do an actuary’s job?), and career-specific interest questions (e.g., How interested are you in being an actuary?). A description was given with each career before the participants were asked about their efficacy or interest (e.g., "An actuary figures out how likely it is that something will happen to people, like getting sick. An actuary has to be good at math"). Academic efficacy, career efficacy and career interest questions were answered for each of the four subject areas, with seven different careers per subject. For the elementary students, we hypothesized that academic efficacy would be broader and more general (e.g., similar across all subject areas) than the college students, who we expected to have much more differentiated, subject-specific academic efficacy. We also expected that the relation between academic efficacy and career efficacy would be more strongly subject-specific for college participants compared to the elementary participants. The data were analyzed using correlational, regression, and ANOVA analyses to determine if our hypothesis was correct. Comparisons were made between the two age groups with respect to how differentiated academic efficacy was across the four subject areas. The results are interpreted in light of developmental changes in efficacy.
Abstract:

There are over 1.5 million users of American Sign Language (ASL) in North America, and a portion of these signers have a limited variety of access to auditory based communication technology. In addition, ASL is the third to fourth most taken foreign language in U.S. colleges and universities. Previous attempts to use technology in aiding the interpretation of ASL and assisting with cross-cultural communication between hearing and Deaf communities have failed to directly seek out the perspective of the Deaf community and ASL users in developing these assistive communication technologies. The present study seeks to obtain a better understanding of the Deaf community as it relates to utilizing technology in their everyday communication through an inductive qualitative method-a focus group of members of the Deaf community in West Alabama. The results of this study rely on the discussion that occurred within the focus group (n = 7), related to technology in professional and personal life. After evaluation and assessment of the focus group discussion, four emergent themes and categories transpired in the data. Respondents noted that technologies which potentially breach confidentiality (e.g., video cameras), or those that are contact devices which must be worn (e.g., signing gloves) are not well designed for the use of ASL, as it conveys much of its linguistic information beyond simple hand gestures. Although mobile phones were something all of the participants in the focus group reported that they rely on heavily, there was the constraint that there are situations in life, such as emergencies and severe weather, where mobile phones are limited and can sever communication channels, which are vital to survival. Lastly, discussants were thrilled with the notion that there could potentially be an ASL friendly luxury such as the Siri or Alexa features on iOS and Amazon products. The findings gathered from this focus group research are essential to guide cross-disciplinary researchers interested in ASL technological developments.
Abstract:

Objectives: This study analyzes the affordability of children's museums across the US. Previous research focuses on museum accessibility or on the impact of children's museums, but there is a lack of information about the impact of children's museum's affordability. Museums serve as centers for childhood and lifelong learning. They provide children with positive, long-term learning experiences, and provide parents with the spaces and tools necessary to become more involved in their children's education. For these reasons, museums must strive to be accessible for all members of their communities. However, not every state has equal access to financially accessible children's museums. The purpose of this study is to determine where in the United States these important centers for learning are most accessible for those living within the state.

Methods: This study compares state-wide income levels to various costs associated with museum attendance. Three geographically diverse museums were selected from each state, with their average costs used to evaluate the state as a whole. The data in this study comes from the museums' websites. The data collected from each museum includes price of admission for adults, price of admission for children, price of a year-long membership for a family of four and price of a field trip per child. These prices are compared to state-wide median household income to determine whether or not they are affordable for local communities. Each state is then awarded one to five points in each category (admission, membership and field trip costs), with a score of five indicating high levels of affordability and a score of one indicating low levels of affordability. The points across each category are added together to create a total for each state. These totals are then compared to analyze the relative affordability of museums across the fifty states.

Results: This study reveals a trend that shows that museums in the Southeast, West and Northeast tend to be less affordable for their communities. Museums in the Midwest and Northwest tend to be more financially accessible.
Abstract:
Avoiding predation is a key issue in the lives of many species, and failing to do so can have severe consequences on individual survival. However, antipredator behavior may change at different life stages. For example, juveniles might allocate more time to vigilance and be more sensitive to the cue of potential predators than adults because mortality as a result of predation is often high for young animals. However, the relationship between age and antipredator behavior is not always clear. Mangrove rivulus fish, Kryptolebias marmoratus, is one of only two hermaphroditic self-fertilizing vertebrates. In both lab and field, we have observed that dragonfly larvae (Erythemis sp.) hunt rivulus fish. However, it is unclear whether rivulus' antipredator behavior is age-dependent. Thus, we aimed to investigate the relationship between age and antipredator behavior in mangrove rivulus. We hypothesized that juvenile rivulus fish (< 3 months old) would avoid environments infiltrated with chemical cues indicating the presence of dragonfly larvae. Because adult rivulus (> 3 months old) might be too large for dragonfly larvae to successfully capture, we hypothesized that they would be insensitive to dragonfly chemical cues.

To assess antipredator behavior in mangrove rivulus, we placed fish in a test tank 4 cm wide by 30 cm long filled with 2 cm of 25 ppt salt water. The tank was divided into 5 equal chambers that the fish could swim freely between. A container of dragonfly larvae was suspended over the tank on one side, and a container of water serving as the control was suspended over the opposite side of the tank. There was one hole at the bottom of each container that allowed the water to slowly drip into the test tank. The fish was acclimated for 15 minutes in the center chamber and was then allowed to freely swim for 30 minutes. We analyzed the frequency and duration of time that rivulus fish approached the chambers closest to the dragonfly larvae suspension (risk chambers) versus the chambers closest to the control suspension (safe chambers). We predicted that juvenile rivulus would have a higher frequency and duration of time in the safe chamber and a lower frequency and time spent in the risk chamber. We also predicted that adult fish would show no preferences between the risk chambers and the safe chambers. Results showed that juvenile fish preferred to be in the safe chambers (time spent in safe chamber: 1036.20±65.39s; in risk chamber: 531.6±65.17s); while the adult fish had no significant preference for risk or safe chambers (time spent in safe chamber: 774.62±58.23s; in risk chamber: 649.93±58.93s). Overall, juvenile fish spent significantly more time in the chamber farthest from the dragonfly larvae suspension, while the adult fish did not, indicating that antipredator behavior in rivulus fish is age-dependent. Specifically, juvenile fish demonstrate more significant antipredator behavior towards the dragonfly larvae than adults.
Abstract:

Floods pose a pertinent risk to human life and property throughout the world; simultaneously, increasing availability of flood observation data holds great potential for efficient real-time flood inundation mapping. In this research project, the researchers are developing computational tools for rapid mapping of flood inundation extent and water depth from point data. The tool is coded in Python 2.7 using the PCRaster geospatial modules and functions. The tool is to be validated using satellite imagery data from missions such as NASA's Landsat, as well as uncertainty calculation methods. We have selected Columbia, South Carolina, as the site of the initial case study, after the significant flooding that the city experienced as a result of Hurricane Joaquin in September and October of 2015. A sensitivity analysis will be performed to reveal the optimal range of parameterization and help in understanding the input data requirements. After initial testing using United States Geological Survey (USGS) High Water Mark point observations, the tool will be expanded to accept point observation data from social sensing techniques and public platforms such as the widely popular Twitter service. The accuracy and availability of these inputs are to be assessed for their applicability, as the input of data must become a largely automated process. In addition, the underlying interpolation algorithms will be tested to optimize processing time as new data inputs are continuously calculated. Ultimately, the researchers aim to develop a web-interface that will generate and visualize flood maps from point observation data in real-time.
Student Presenter: Amira Aquino
Title: Acanthophora dendroides Harvey: a new record for the Atlantic Ocean

Abstract:

The red algal species Acanthophora dendroides (Rhododolomelaceae) was first described by W.H. Harvey in 1855 for the locality of Rottnest Island in Western Australia. This species was previously thought to be restricted to the Pacific and Indian Oceans. In this study, we made a morphology and genetic-based analysis of several specimens from the genus, Acanthophora, collected from several different locations. We PCR amplified and sequenced the plastid-encoded large subunit ribulose-bisphosphate carboxylase/oxygenase gene (rbcL) and the barcode region of the COI (cytochrome c oxidase subunit I). Phylogenetic trees for both markers were built. The COI-5P NJ (Neighbor Joining) tree was based on p-distances (patristic) while a Maximum Likelihood (ML) tree was generated for the rbcL. Phylogenetic results confirm the presence of Acanthophora dendroides Harvey in the Atlantic Ocean using the morphological and molecular analysis of the plastid-encoded rbcL, the barcode region of COI gene and the SSU rRNA. Sequencing more type specimens for other names in this genus will allow a better understanding of their systematics. Moreover, in light of this new phylogenetic analysis that includes several sequences of the type species of the genus, Acanthophora spicifera, we show that the flat species of Acanthophora, A. pacifica (Setchell) Kraft, belongs to a clade of flattened Chondria species and here we propose to transfer this species to Chondria C. Agardh with a new binomial, Chondria multispinosa Garcia-Soto & Lopez-Bautista nom. nov.
Student Presenter: Grace Beal
Title: Analysis of Gas Distribution in the Circumgalactic Medium

Abstract:

Not Publishable
Student Presenter: Whitney Beavers
Title: Comparing column and non-column, Trizol-based RNA extraction protocols for the study of LanA transcriptional expression and its genotype by diet interactions in Drosophila melanogaster

Abstract:

Not Publishable
Abstract:

Artificial reefs are an important strategy to mitigate habitat loss in the marine realm. They have been used worldwide to provide habitats, nurseries and breeding grounds for fish and a myriad of other species. Artificial reefs have also become important to humans for repurposing waste products like old tires and various building materials. For this project we wished to determine the differences in community structure between artificial reefs of varying ages and natural reefs. Two artificial reefs were constructed from rocks, old concrete blocks, conch shells, and palm fronds. Two other artificial reefs that had been constructed in the past were also observed: one a year old and one two years old. Two different patch reef sites were sampled, each with different percentage cover of coral. Biodiversity and abundance counts surveys were taken at three critical times during the day for the artificial reefs, and twice for the control. We found that fish showed up generally quicker than we originally thought, and the younger reefs, though very biodiverse, had smaller-sized individuals than larger reefs. In conclusion, older reefs can support greater community structure for their inhabitants.
Abstract:

Ammonia borane (AB) has been a compound of interest since the 1960's due to its large percent of hydrogen by weight. AB is approximately 19 wt% hydrogen and is a relatively stable solid at room temperature, therefore it is being studied for use as a chemical hydrogen storage material. Another possible use for AB is as a regenerable energy cell, in which the hydrogen is used to power a system and then reattached to the molecule. A detailed understanding of the degradation of the product will facilitate development of an improved regeneration method. The purpose of this investigation was to use raman spectroscopy to track the thermal decomposition of ammonia borane. Raman spectroscopy of AB thermal degradation products has previously been performed, however, these products were exposed to atmosphere during spectrum acquisition. In our investigation the raman spectra were acquired under inert gas because the products react with water. Infrared (IR) spectroscopy has been used in the past to study AB materials. Raman and IR spectroscopies are complimentary; between these two vibrational spectroscopies, all active modes can be seen. Raman spectra of the decomposition materials were acquired as a function of temperature and time. These raman spectra were then compared to previous results, including computationally determined raman spectra. This work provides another method for determining the products of AB thermal degradation with respect to temperature and time by combining in situ raman spectroscopy, computational chemistry, and data analysis.
Student Presenter: Jalen Cates, Andrew Stewart
Title: The superconducting properties of YBa2Cu3O7 samples minutely-doped with dysprosium

Abstract:
Superconductivity is a powerful tool, but the critical temperature of superconductors must be reasonably high. The discovery of Rare Earth-BaCuOs (REBCO) with a critical temperature of ~90K, which is above the boiling point of nitrogen, sparked a new era of research. The most popular REBCO is YBCO and has a critical temperature of 93K. Many dopants have been tested in the yttrium site, but few studies have tested dysprosium, especially in minute amounts (<10%). We hope to investigate the incorporation of dysprosium into the crystalline structure and the superconducting properties of the Dy-doped samples.
Abstract:

Genes encode proteins and proteins perform work. Drosophila melanogaster belongs to a clade of insects distinct for reduced number of male, compared to female, abdominal segments. We study this trait to explore mechanisms of region- and sex-specific cell identity. Hox proteins pattern the anterior to posterior axis of the fly (and most other animals) while sex-specific versions of the Doublesex protein (Dsx) shape gender-specific tissue development. Our preliminary results show the most-posterior Hox protein, Abdominal-B (Abd-B), engages in a regulatory loop with Dsx proteins. Abd-B activates Dsx gene expression in the terminal abdomen, and the Dsx proteins, in turn, feedback to control Abd-B protein expression: positively in males and negatively in females. The result is reduced Abd-B and Dsx proteins in females compared to males. These disparate levels cause the terminal segment to be eliminated in males. This feedback regulation could occur either through regulation of Abd-B gene expression or by modifying Abd-B protein stability. We will test both hypotheses by quantifying levels of Abd-B gene expression in flies that are either mutant for or over-express sex-specific Dsx proteins. Results will support only one hypothesis and will therefore inform future directions of this research. Importantly, both flies and humans have Hox and Dsx proteins; which in humans contribute to a number of disease states (including, testicular cancer). Understanding the interrelationship between these two classes of developmental genes in Drosophila will shed light on their functions in humans and may open avenues for exploring their combined contributions to human disease.
Abstract:
Developing ways to produce efficient, clean, and renewable energy by using inorganic, continuous nanowires is a promising avenue because these nanostructures can be used to complete water electrolysis with high surface area and efficient charge collection. This process splits water into its elemental components of hydrogen and oxygen. Hydrogen serves as a clean energy source for later use to generate electricity. The electrochemical water oxidation half-reaction is sluggish with most electrode materials and high cost along with a low surface area are other critical issues existing with efficient catalytic electrode materials like platinum and iridium oxide. In this study, low-cost TiO2 nanofibers were electrospun by using a solution containing titanium isopropoxide (TIP), polyvinylpyrrolidone (PVP), ethanol, and acetic acid. These fibers were then annealed to a Ni foam substrate to help support a carbon doped NanoCOT electrode material. Ni foam was selected as the substrate to help the production of hydrogen due to its low cost and high surface area along with the catalytic activity of the NanoCOT. The samples of annealed TiO2 nanofibers on Ni foam were used to split water in an electrochemical cell and electrochemical data were gathered to demonstrate the capability and performance for large-scale hydrogen production.
Student Presenter: Kasie Coogan
Title: Characterizing the Uptake of Quinic Acid and Tannic Acid Coated Iron Oxide Nanoparticles in Cancer Cells

Abstract:

Not Publishable
Abstract:
Water planning and management decisions are generally based on observed (historic) records. For streamflow, these records typically have a very short period of record (e.g., 50 to 100 years). Thus, water system allocation and subsequent risk are based on a limited record of data. The ability to use dendrochronological (tree ring) proxies to extend the observed streamflow record back into the paleo period (300 to 1000 years) provides water managers and planners with a better understanding of the long-term natural variability of the watershed. Several watersheds, including those that contribute flow to the State of Alabama were evaluated. These watersheds included:

- Etowah River at Canton GA (Coosa River Watershed)
- Chattooga River at Summerville GA (Coosa River Watershed)
- Cahaba River at Centreville AL
- Tombigbee River at Demopolis AL
- Sucarnoochee River at Livingston AL
- Uchee Creek near Fort Mitchell AL (Chattahoochee River Watershed)

The United States Environmental Protection Agency (EPA) Gulf of Mexico (GoM) program sponsors the current research.
Abstract:

Characterized mainly by the loss of dopaminergic neurons within the brain, Parkinson's Disease (PD) is the second most common neurodegenerative disorder. Although 5-10% of Parkinson's cases have been directly linked to genetic origins, PD is still largely considered an idiopathic disease. One potential risk factor appears to be living in a rural environment; as this is often correlated with exposure to pesticides, increased contact with soil, and drinking well water. Caenorhabditis elegans (C. elegans), a microscopic nematode with relatively simple neuronal circuitry, has proven incredibly valuable as a model for Parkinson's disease and the overall study of neurodegeneration. Previous projects performed by our lab have identified and studied the potential link between a secondary metabolite produced by the common soil bacterium Streptomyces venezuelae (S.ven) and neurodegeneration. It was also observed by our lab that the DAF-7/TGF-β molecular signaling pathway which controls an avoidance behavior in C. elegans is triggered by the S. ven metabolite. To further study the mechanisms behind the effects of the S. ven metabolite, we have been studying the details of the avoidance behavior through a specific assay. The behavioral assay depends on the fact that the worms normally stay centered on bacterial lawns, which serve as their source of nutrition when growing on petri dishes in the lab, but will avoid either pathogenic bacteria or normal innocuous bacteria when it has been mixed with the noxious stimulus. C. elegans, which is the only animal to have had its complete neuronal circuitry mapped and defined, affords the possibility to link behavior to individual neurons. This, in turn, enables unprecedented accuracy in quantifying cell-specific effects. Therefore, we have been looking at the neuronal circuitry that contains the chemosensory ASI and ASJ neurons which control avoidance. The ASI and ASJ neurons are where the activation of the DAF-7/TGF-β signaling pathway begins and have been labeled with a fluorescent indicator, green fluorescent protein (GFP) in our C. elegans strain. This fluorescence becomes brighter when the neurons are activated. Using this marker, we are able to quantify the degree of brightness through measuring pixel intensity. Thus, we can quantify the degree of activation of the signaling pathway in response to the S. ven metabolite exposure. Through these studies, we hope to uncover a mechanistic relationship between an evolutionarily-conserved genetic pathway linked to neurobehavior and an environmental component that may alter the balance of neuronal activity as it pertains to PD and those in rural areas more exposed to such factors.
Abstract:

The objective of this project is to collect land cover, temperature, precipitation, and vegetation data in order to draw conclusions about how climate change is affecting the habitat of the snow leopard. The ultimate goal of this research is to identify habitats that must be protected to ensure the snow leopard's continued survival.

The snow leopard lives in high-elevation areas in Bhutan, Nepal, India, China, Russia, Tajikistan, Kyrgyzstan, and Mongolia. The snow leopard acts as a keystone species in these high-elevation areas, regulating herbivore populations such as that of the blue sheep. However, the snow leopard population has shrunk drastically in recent years due to poachers, urbanization, and climate change. Scientists estimate that there are between 3,000 and 7,000 snow leopards left in the wild.

Depending on the latitude of a specific area, the snow leopard can live in elevations as low as 2,000 meters and as high as 5,000 meters. In order for the snow leopard to live in a particular area, temperatures must be cold, food must be available, and vegetation factors must be met. Furthermore, changes in precipitation and other environmental variables can alter critical habitat areas of the snow leopard, which can harm its ability to survive and reproduce.

The Snow Leopard Trust, a snow leopard conservation organization, supplied to the researchers shapefiles containing the locations of critical habitat areas of the snow leopard. The shapefiles were imported into a geographical information systems software called Google Earth Engine. Landcover, temperature, precipitation, and vegetation datasets were analyzed within the critical habitat areas.

Two-thirds of the critical habitat areas of the snow leopard decreased in precipitation from 1995 to 2013. Five-sixths of the areas in which temperatures were analyzed experienced temperature increases from 1995 to 2015. In general, from 2001 to 2013, barren landcover decreased, grassland increased, and ice cover showed a mixed response. Seventy percent of habitats showed an increase in non-vegetated land.

These climatic changes suggest that in order to protect critical habitats of the snow leopard, it is important that we focus on preserving areas that have recently undergone vegetation increases. An increase in vegetation in a particular area could lead to herders bringing their sheep into higher elevations, which could in turn result in more human-leopard conflicts. Furthermore, areas that are still cold enough to be prime snow leopard habitat should be protected because as temperature increases in lower elevations, the snow leopard will gradually move up in elevation to colder habitats.

The limitations of this study are those associated with many big-data remote sensing projects. The researchers have not been able to visit the study areas and thus have not ground-truthed any of the datasets. Furthermore, since overall error estimates for the datasets may differ from the particular projected error estimates in analysis regions (critical habitat areas), there is the risk that the true error of the datasets has not been adequately estimated.
Session 2: 10:30-12:00 | Life Sciences, Physical Sciences, Mathematics, & Water  
Category 1: Work in Progress  
Poster Number: 41  

Student Presenter: Bailey Creighton  
Title: The Impact of Vitronectin on Cancer Stem Cells in Glioblastoma Multiforme  

Abstract:  
Not Publishable
Abstract:
We investigate the occurrence of accreting supermassive blackholes, also known as active galactic nuclei (AGN). AGN release massive amounts of energy and are important in regulating the star formation in galaxies. Multiple mechanisms are thought to trigger AGN, including mergers of two galaxies (external process) or bars and spiral arms within galaxies (internal process). The relative importance of each triggering mechanism is not well known. In part, this is because AGN luminosities vary in time, moving between low luminosity and high luminosity phases. AGN are thought to spend a longer time in their low luminosity phase. Unfortunately, low luminosity AGN are especially hard to detect but may be the key to determining the dominant mechanisms that trigger AGN. In this work, we are building a sample of non-merging galaxies with archival X-ray observations from the Chandra Space Telescope. This will complement an ongoing Chandra observing project targeting merging galaxies. We will then compare the occurrence of AGN in the merging and non-merging galaxies to place constraints on triggering mechanisms and the impact of the AGN on the host galaxy.
Student Presenter: Owen Cunneely, Kara MacIntyre
Title: Determining the Influence of Gut Microbiota Composition on D. melanogaster Metabolic Phenotype

Abstract:
In today's society, there has been a widespread increase in calorie intake in humans in addition to a general decrease in exercise, which contributes to an increase in the frequency of symptoms of Metabolic Syndrome (MetS) across the population. These symptoms, which include obesity, elevated blood lipids, and insulin resistance, are highly associated with harmful conditions such as type-2 diabetes and cardiovascular disease. It is also known that the gut microbiome plays a major role in the development of these symptoms. Our study focuses on a number of these symptoms, and attempts to determine the influence of larval diet, genotype, gut microbiota, and their specific interaction on the development of the metabolic phenotype in Drosophila melanogaster. We are taking a novel approach to study these interactions by using distinct genetic lines of D. melanogaster and placing them on not only a variety of standard lab diets, but also natural rotten peach diets which include diverse microbial communities. The preliminary results obtained so far indicate that Drosophila raised on natural diets have lower weight, triglyceride, and protein levels. This is indicative of the significant role of gut microbiota on influencing the metabolic phenotype of D. melanogaster. Our project aims at evaluating the active role of these gut microbes, as well as examining the effects of pioneer microbiota species, diet, and genotype on the overall metabolic phenotype in D. melanogaster. These results will help researchers develop potential treatments for the symptoms of MetS that account for the effects of the gut microbiome's interactions with the rest human physiology.
Abstract:

Mangrove ecosystems are home to a diversity of aquatic organisms, yet are being threatened by anthropogenic disturbance. Mangroves are often exposed to wastewater treatment plant effluents, subjecting organisms to various endocrine disrupting compounds (EDCs), such as ethinyl estradiol (EE2). Mangrove rivulus fish (Kryptolebias marmoratus) reside in mangroves and are an excellent model organism in which to assess EDC effects on mangrove inhabitants. Studies have shown that EDC exposure in fish can drastically alter their behavior. However, little is known about how EDCs impact behavioral consistency in exposed individuals. We examined the effects of an environmentally relevant dose of EE2 on aggression in adult male and hermaphrodite mangrove rivulus. We hypothesized that individuals exposed to EE2 will exhibit changes in aggression. Specifically, we predicted that mangrove rivulus will become less aggressive following exposure, and that males will differ from hermaphrodites in their response. Eighty adult rivulus, half male and half hermaphrodite, were dosed with 80 ng/L of EE2 for 40 days. Prior to exposure, aggression was measured twice, with a week between measurements, to establish baseline behavior. Aggression was measured again at 34 and 40 days following the initial exposure to determine the effects of EE2 exposure on aggression. We found that aggression does change in sex-dependent ways following exposure to EE2. Our findings provide insights into how EDC exposure alters behavior in fish, which could potentially disrupt interactions among conspecifics as well as species interactions at the community level.
Abstract:

The Compact Muon Solenoid (CMS) Detector measures high-energy particle collisions at the Large Hadron Collider (LHC) to test and study the Standard Model, the theory which describes the fundamental interactions between elementary particles. In this work, we focus on studying the Standard Model by measuring diphoton and triphoton production processes with the CMS detector. Using ROOT software for high-energy physics, we perform studies on various simulated multiphoton events to ensure that they align with the predictions of the Standard Model. The simulation includes both generated and reconstructed information on the photons, which should agree provided the detector and software to analyze the data are accurate. Using ROOT, we study the difference between the generated and reconstructed photons measurements, specifically the transverse momentum, by performing various cuts on the data in cases of anomalously low or high reconstruction energies. These selections aim to reveal patterns in the location of measurements with high error to help determine its source. Determining the cause of high error would provide valuable information as to the accuracy of the detector and the software analyzing the results, indicating areas in need of improvement to provide the most accurate results possible.
Student Presenter: Hannah Dickson
Title: New garnet Sm-Nd age for garnet zone metamorphism in the western Blue Ridge, Ducktown, TN

Abstract:

The Appalachian Blue Ridge rocks are the product of continental rifting, collision, and accretion along the eastern Laurentian North American margin. The copper ore bodies around Ducktown are hosted by garnet zone rocks of the western Blue Ridge (WBR). These sulfide deposits are found in the Copperhill formation in the lower part of the Great Smoky Group. The garnet-bearing rock analyzed in this study was collected from the Bura Bura mine tailings courtesy of the Ducktown Basin Museum.

Pressure, temperature, and timing of metamorphism in the Ducktown area are not well known. Monazite EPMA ages from the Ocoee Gorge, ca. 24 km west of Ducktown, determined that metamorphism occurred ca. 400 Ma (Kohn and Malloy 2003). Zircon U-Pb data from Winding Stair Gap, ca. 77 km east of Ducktown in the eastern Blue Ridge, show granulite facies metamorphism and partial melting ca. 458 Ma (Moecher et al., 2004). Whole rock 40Ar/39Ar cooling ages for the WBR, ca. 5-175 km north of Ducktown, are 499-389 Ma (Connelly and Dallmeyer 1993). In addition, garnet in the Alabama Blue Ridge is early Alleghanian (Stowell et al., 2014). These previously published results are compatible with Ducktown metamorphism occurring during the Taconic, Acadian, or Neocadian or early Alleghanian orogenies.

The garnet-chlorite schist discussed here is inferred to have been a basalt based on major element chemical composition: 49.88% SiO2, 15.28% Al2O3, 5.05% MgO, 23.73% Fe2O3(total Fe). The mineralogy is actinolite-hornblende, garnet, chlorite, quartz, plagioclase, biotite, and arsenopyrite. Four to seven mm subhedral garnet containing numerous quartz inclusions are surrounded by chlorite, indicating partial replacement of the garnet and final mineral growth during decreasing temperatures.

Garnet in this sample was dated using Sm and Nd isotopes. This method utilizes decay of the radioactive parent Sm and production of the daughter Nd. The garnet isotopic composition is compared to the whole rock and other minerals to fit a line or isochron in 143Nd/144Nd vs. 147Sm/144Nd space. The slope of this line yields the age. Sample preparation includes silicate dissolution, ion chromatography which is used to separate Sm and Nd, followed by analysis on the UA Radls VG Sector 54 thermal ionization mass spectrometer (https://radis.as.ua.edu). Sample aliquots used for geochronology are whole rock (WR), matrix (Mtx), amphibole (Amp), and garnet (core, rim, and bulk). 147Sm/144Nd isotope ratios are 0.0992-0.1149 for WR, Mtx, and Amp, and 0.6115-2.6306 for garnet separates. Sm-Nd data yield an age of 449±12 Ma (7 pts., 2sigma uncertainty) and an initial 147Sm/144Nd of 0.00017. Our new age indicates that garnet zone metamorphism is Taconic and not Alleghanian. Therefore, early Alleghanian metamorphism which has been identified in the
Blue Ridge of Alabama (Stowell et al., 2014) did not extend into the western Blue Ridge in southern Tennessee.
Student Presenter: Bridget Donahue, Kelly Duerr, Cole Griffith, Ana Sokolenko, Sara Tiberi  
Title: Climate Variability in Southeast US Coastal Streams

Abstract:
Precipitation gages and unimpaired (no anthropogenic influences) streamflow gages were identified in coastal regions of the Southeast United States. The influence of climatic drivers such as the Pacific Decadal Oscillation (PDO), Atlantic Multidecadal Oscillation (AMO) and the El Nino-Southern Oscillation (ENSO) on these streamflow gages were evaluated. While both the ENSO and AMO signals have been previously identified in these regions, the coupling of the high frequency ENSO with the low frequency AMO resulted in below normal annual streamflow when a La Nina occurs during an AMO Warm phase. The AMO has been in a warm phase since ~1995 and, given the occurrence of multiple La Nina’s since ~2000, historic 10-year low flows were observed in several streams. Incorporating climate variability in water resources can provide water managers and planners useful information in evaluating water availability and the associated risk in estimating annual and seasonal water allocations. The United States Environmental Protection Agency (EPA) Gulf of Mexico (GoM) program sponsors the current research.
Student Presenter: Ashley Eberly
Title: Predicting the Properties and Covalency of High Oxidation State An(OH)x Complexes

Abstract:
Not Publishable
Student Presenter: Brandon Edney
Title: The Impact of Lonafarnib on the Behavior of Glioblastoma Stem Cells

Abstract:

Not Publishable
Abstract:

Unimpaired (no anthropogenic influences) streamflow gages and precipitation gages were identified in coastal regions of the Southeast United States. While precipitation was measured in units of length (centimeters), streamflow was measured in average flow rate (cubic-meters per second) over some period of time (year). Streamflow was first converted to annual volume (cubic-meters) by simply multiplying the average flow rate times the length of record. By knowing the watershed area (square kilometers) contributing to the streamflow gage, we can then divide that area into the volume to determine the average runoff for the watershed in terms of length (centimeters). Thus, in evaluating a basic water balance model of a watershed [Inflow - Outflow = Delta Storage], Precipitation (P) and Groundwater-In are the major influxes while Runoff (Q), Groundwater-Out and Evapotranspiration (ET) are the main outfluxes. We assume net change in watershed storage over a year is negligible, thus Delta Storage is zero. We also assume Groundwater-In is nearly equal to Groundwater-Out for a large watershed. Thus, the water balance equation reduces to ET = P - Q.

Using the observed P and Q data, we then estimated ET-Observed for seven SE US Coastal Watersheds. We then obtained ET-Modeled data from the NLDAS Noah Land Surface Model at grid points spatially located near the watershed P gage and Q gage locations. We then compared ET-Observed to ET-Modeled for the seven watersheds. The United States Environmental Protection Agency (EPA) Gulf of Mexico (GoM) program sponsors the current research.
Student Presenter: Olivia Fish
Title: Assessing the impact of a mushroom-toxin and gene inhibition on the physiology of Drosophila tripunctata

Abstract:
Because organisms are constantly evolving in response to their surroundings, the study of the evolution and diversification of novel adaptations is an integral part of evolutionary biology. However, little research has been done concerning the evolution of complex, novel biochemical traits. One such adaptation can be found in mushroom-feeding Drosophila species. These flies have evolved a unique tolerance to Amanita mushrooms, using them as larval hosts and food sources, despite the fact that they contain the lethal toxin α-amanitin, which is poisonous to nearly every other eukaryotic organism. Therefore, we are seeking to understand the mechanisms of this adaptation by examining the variation in the toxin tolerance in a local population of Drosophila tripunctata. Significant genetic variation in survival to pupation has been observed when these ten strains were raised on a diet consisting of natural concentrations of α-amanitin. Furthermore, when two classes of detoxification genes (Cytochrome P450s and Glutathione S-Transferases) were inhibited in these same lines, tolerance was not lost in most cases, but a variety of responses were observed. In this study, we are determining the weights of the adult flies to assess whether the presence of toxin or inhibition of detoxification pathways impacts their growth. Through this work we will quantify the genetic by environmental interaction in these strains to α-amanitin in order to better understand this novel biochemical adaptation.
Abstract:

In recent decades, the incidence of metabolic disorders such as diabetes and obesity has grown at an unprecedented rate in the United States, contributing to more than 20% of American adult deaths. These conditions, part of a cluster of disorders termed Metabolic Syndrome (Met S), often lead to other comorbid conditions and are responsible for a drastic increase in mortality risk. One tactic to combat Met S is the use of non-nutritive artificial sweeteners (NNS) in place of sugars and other calorically-dense sweeteners. However, previous studies in humans and model organisms suggest that regular consumption of artificial sweeteners may not have the intended metabolic benefits, and even lead to detrimental effects. Drosophila melanogaster, commonly known as the fruit fly, serves as an effective model to study the effects of diet supplementation with artificial sweeteners due to their genetic homology with humans, rapid generation times, and exceptional fecundity. Our previous study aimed to characterize the effects of NNS (aspartame, saccharin, sucralose, and stevia) on different genetic lines of D. melanogaster, and assess whether genotype-by-diet interactions have a significant influence on various metabolic outcomes. Ten distinct genetic lines of D. melanogaster from the Drosophila Genetic Reference Panel (DGRP) were reared on five different diets consisting of the normal lab food and four NNS-supplemented diets. Fly pupae were collected after several days and preserved by freezing. Pupae were weighed and body mass data analyzed via ANOVA. Results from the preliminary study demonstrated that there are significant interaction effects between NNS-supplemented diet composition and genetic background on body mass variation in male D. melanogaster. Current research aims to further evaluate the metabolic phenotype by assaying lipid storage and glucose levels. Observation of further interaction effects would suggest a genetic basis for individual variation in metabolic outcomes with NNS-supplemented diets, and signify the need for further investigation into molecular mechanisms and possible gene targets, hopefully leading to personalized medicine recommendations for NNS use based on genotype.
Abstract:

Purpose: Inflammaging, an age-dependent chronic inflammatory process, is believed to contribute or exacerbate age-related diseases such as neurodegeneration. However, little is known about the etiology of inflamming. The fruit fly Drosophila can be used to model innate immune system responses since the molecular pathways causing its activation are conserved from fruit flies to mammals. The Transglutaminase (Tg) gene, a negative regulator of the innate immune pathway that serves as a neuroprotective mechanism in flies, leads to increased brain inflammation and shorter lifespan if lost. Therefore, studying the accelerated inflamming of Tg mutants can lead to unbiased discovery of novel genes and cellular mechanisms related to this process.

Methods: In the Chtarbanova lab, we perform an in vivo sensitized genetic screen for brain inflammation modifiers in heterozygous Tg mutant flies to discover dominantly interacting genes. Homozygous Tg mutants are crossed to flies carrying gene deletions on various portions of the fly genome, and their progeny is collected, aged and tested for neurological defects and increased brain inflammation after 30 days using a behavior climbing assay and gene expression analysis, respectively. We anticipate that the Tg modifier genes we discover are likely to be involved in the age-dependent activation of the fly neuroinflammatory response.

Results: So far, we were able to identify one deficiency line that spans 89 genes. When crossed to Tg flies, the Def/Tg progeny exhibited neurological defects and increased brain inflammation similar to homozygous Tg mutants.

Discussion/Conclusion: This result indicates that a gene within this region of the genome is a potential modifier of the innate immune response. By using overlapping smaller deficiency lines, future experiments will determine the exact gene that interacts with Tg and address the question of the molecular mechanism involved.
Student Presenter: Lucas Glisson  
Title: Impact of Temperature Gradients on Phosphorus Content of Mayflies in the Alaskan Tundra

Abstract:

The Arctic is anticipated to increase in average annual temperature more so than temperate or tropical regions in the Northern Hemisphere. As temperature increases in the Alaskan tundra, we hypothesize that organisms will have a higher phosphorus demand. This is implied by the Growth Rate Hypothesis as faster growth rates in organisms enhances rRNA production. The increased demand of rRNA requires phosphorus, thus an animal's tissue will reflect the higher amount of phosphorus storage needed for survival. Previous literature has indicated a relationship between rRNA synthesis and phosphorus content. The goal of our experiment was to test the hypothesis that rising temperatures in the Alaskan tundra will positively correlate with an increased growth rate and the proportion phosphorus these organisms require. In this experiment, stream-dwelling mayflies (Baetis spp.) were collected in small streams ranging from 300-900 meters in elevation with lower temperatures found at higher elevations. The mayflies were dried at the field station and bought back to the lab for particulate phosphorus analysis. The increasing importance of phosphorus demand in these organisms are presenting some of the life history constraints brought on by climate change. These findings will provide evidence towards how rising global temperatures are affecting one of the world's most sensitive biome to anticipated climate change.
Student Presenter: Samantha Glukhova
Title: Role of neutral cholesterol ester hydrolase gene in lifespan and neuroprotection in a C. elegans model of Parkinson's Disease

Abstract:

Parkinson's disease (PD) is the second most common neurodegenerative disease. The loss of dopaminergic neurons leads primarily to muscle tremors. Aging is one of the contributing factors for PD, with age correlated with an increase in PD occurrence. PD is characterized by the accumulation of the α-synuclein (α-syn) protein as aggregates in and around the neurons. We have developed an experimental model of PD in the roundworm Caenorhabditis elegans by expressing human α-syn in the dopaminergic neurons, which then causes these cells to degenerate. We are using this model to identify genetic components that act together with aging to contribute to PD. One such gene is daf-2, which, when mutated in C. elegans, extends lifespan and protects dopamine neurons from α-syn. A screen for genes involved with daf-2 identified nceh-1. Loss of nceh-1 enhanced neurodegeneration, while overexpression was neuroprotective. NCEH-1 is a conserved enzyme that converts esterified cholesterol to free cholesterol. Lower cholesterol levels in the C. elegans growth media was also neuroprotective. Since this gene was identified by its relationship to the longevity gene daf-2, we are determining if nceh-1 also alters the lifespan and healthspan of C. elegans and if cholesterol modulates this effect.
Abstract:

Aplacophorans are a group of small, worm-like animals that are closely related to snails and other molluscs. Aplacophora only has about 415 described species, but estimates indicate that there may be up to ten times as many species that have yet to be named. These animals are particularly difficult to study due to their small size, morphological similarity, and ecological niche restricted largely to the deep sea. As a result, only 5 labs worldwide study the taxonomy of this group, and its phylogeny has yet to be fully elucidated. Fortunately, the amount of available specimens has increased, and we are now capable of performing a large-scale phylogenetic analysis of mitochondrial gene sequence data for the purpose of developing a family tree that more accurately reflects the biodiversity and evolutionary relationships among species in this group. We took 75 specimens spanning the diversity of Aplacophora, imaged them using light and scanning electron microscopy, and developed a library of sequences from each for the mitochondrial COI gene. COI encodes a protein subunit that is essential for eukaryotic metabolism, and thus experiences mutations at a slower rate than most of the mitochondrial genome. Using these sequences and transcriptome data from select taxa spanning the diversity of Aplacophora, we inferred evolutionary relationships between genera in this group. Our results shed light on the phylogeny of Aplacophora, the utility of morphological characters traditionally used to classify this group, and provide a database of DNA barcode sequences for many different genera that can be used by future scientists specializing in other fields to identify unknown specimens.
Student Presenter: Amber Gomez
Title: Computational Studies of the Electron and Fluoride Affinities of Early Actinide Oxides and Oxo-Fluorides Complexes

Abstract:

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Abstract:

Extreme environments place numerous, often conflicting, stresses on the species that inhabit them. How these species ultimately cope with these stressors and live in these environments depends largely on the traits they possess, and more importantly, how these traits are related to one another. When functional limitations prohibit two traits that positively affect fitness from being modified by selection simultaneously, then there exists an evolutionary 'trade-off' between these traits. Here, the ultimate result of selection may be an organismal design that is not perfectly adapted to all conditions. The mangrove rivulus, and its close relatives, occupy habitats that fluctuate widely in water availability, a potentially perilous habitat feature for these fully aquatic fish. Interestingly, these fish have evolved a unique strategy to deal with this threat: a form of terrestrial locomotion called 'tail-flip' jumping. How these fish evolved the ability to locomote terrestrially while also maintaining the ability to swim is still largely unknown. In this study, we will use phylogenetic comparative methods to determine whether 'trade-offs' between swimming and jumping performance have evolved in the mangrove rivulus and its close relatives. Understanding whether 'trade-offs' among fitness related performance characteristics, such as swimming and jumping, have evolved and persisted as species have diverged may help us identify important constraints to future evolutionary change.
Student Presenter: Zoe Guckien  
Title: Analysis of the Role of cis-Regulatory Elements in RNA Methylation

Abstract:
RNA methylation is an important and abundant post-transcriptional modification regulating many genes. In Saccharomyces cerevisiae (baker’s yeast), the protein Ime4p is a 6-methyladenosine methyltransferase that utilizes the methyl donor S-adenosylmethionine (SAM) to modify mRNA and regulate its levels. Crucial to its function are two other proteins, Mum2p and Slz1p, which have been shown to associate with Ime4p to form the MIS (Mum2, Ime4, and Slz1) complex. RNA cis-regulatory elements are hypothesized to control methylation by the MIS complex. Cis-regulatory elements are regions of DNA or RNA near or within a gene that promote the proper expression of that gene. A mRNA transcript library of eight S. cerevisiae genes with distinctive methylation patterns and containing putative cis-regulatory elements was synthesized in this study. In future research, this library will be used for methylation assays using constructs of the MIS complex to observe the effects of cis-regulatory elements on methylation activity.
Student Presenter: Joline Hartheimer
Title: Targeting Hyaluronan Interactions for Glioblastoma Stem Cell Therapy

Abstract:
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Abstract:

Aplacophora is a group of small marine animals that are closely related to snails and other molluscs. Aplacophora consists of two taxa: the caudofoveates and the solenogastres. They are small, found in deep waters, and morphologically similar to one another, making their study relatively challenging. While aplacophorans are both ecologically and evolutionarily important, their phylogenetic relationships are not yet fully known. There are undoubtedly new species of Aaplacophora that have yet to be discovered, as well as taxonomic groups that need to be revised. The present study aims to assist in these efforts by providing in-depth population genetic data from a large number of specimens collected from the North Atlantic Ocean near Iceland and Norway, as well as off the coast of North Carolina. These specimens all appear to belong to the same species - the solenogastre Wirenia argentea. However, the wide geographic range of these specimens raises a possibility that they constitute multiple "cryptic" species. This study aims to use DNA barcoding to sequence the mitochondrial COI gene of these specimens and compare their genetic diversity to their spatial distribution. By using a biogeographic approach, we hope to see how geographic features have influenced the population genetics of W. argentea, as well as identify any specimens that have been incorrectly classified as W. argentea and may in fact represent new species. Using specimens collected by Dr. Kocot and the IceAGE project, scanning electron microscopy was used to identify individual specimens that met the morphological characteristics of W. argentea. These specimens were then grouped into site clusters based off the latitude and longitude at which they were collected. At least five specimens from each site were selected for DNA barcoding. The specimens' genetic data will be analyzed in their geographical context, providing fuller and more accurate information about the phylogenetic history of W. argentea. DNA barcode data will be entered into the Barcode of Life Database (BOLD), providing valuable information for future research endeavors.
**Abstract:**

*Drosophila melanogaster* provides several tools for exploring the genetic basis of sexual dimorphism, a powerful trait for investigating principles of conserved genetic pathways. One such dimorphism in *Drosophila* is adult abdominal segment number; females have seven segments, whereas males only have six. During early pupal development, males generate a terminal seventh segment (A7), but it is eliminated through a combination of cell extrusion and cell death. Our previous research has shown that male A7 loss is governed by a regulatory network including the Homeotic protein Abdominal-B (Abd-B), the sex-determination protein Doublesex (Dsx), and the developmental morphogen Wingless (Wg) - a broadly expressed signaling molecule conserved in all animals. Improper regulation of Wg homologs in humans is associated with a number of diseases, including cancer. In the *Drosophila* abdomen, Abd-B positively regulates Dsx expression, which functions differently in males and females. In males, Dsx represses A7 Wg expression, leading to A7 loss. In females, Dsx does not affect Wg expression, allowing for A7 retention. Two additional factors are regulated downstream of Abd-B and Dsx. The Epidermal Growth Factor Receptor (EGFR) pathway is also repressed in male A7 while the transcriptional repressor Extramachrochaetae (Emc) is elevated. Both the EGFR pathway and Emc contribute to Wg regulation. EGFR is a positive regulator, so its absence from male A7 coordinates Wg repression. Emc is a negative regulator, so its elevation contributes to male A7 loss. Therefore, Wg is positioned at a nexus of genetic regulation, and its repression is the principle mechanism of eliminating male A7. To date, our analyses have focused on Wg protein expression. The manner by which each of these upstream factors contributes to Wg repression may involve multiple mechanisms including transcriptional regulation or post-transcriptional processes. In this project we investigate whether all upstream factors coordinate Wg repression via transcriptional control, and if so, whether they all converge on a common genetic switch - sequences of DNA known as cis-regulatory elements (CREs) that control when and where a gene is transcribed. To accomplish this, we analyze expression changes in a set of transgenic reporters. The first reporter (wg-LacZ) expresses the protein beta-galactosidase under control of all wingless CREs. Two additional reporters, which drive expression of Green Fluorescent Protein, contain a single wingless abdomen-specific CRE identified in the Yoder lab. In one of these reporters we have mutated a pair of putative Dsx binding sites. To assay transcriptional regulation, we generate patches of cells (clones) that ectopically express or inactivate Abd-B, Dsx, EMC, EGFR signaling or Wg signaling. These clones are assayed for Wg protein expression as well as activity of wg-LacZ and the two abdomen-specific CREs. Such comparisons will determine whether all upstream factors coordinate their regulation via wingless transcriptional control, and if so, whether this regulation converges on the abdomen-specific CRE. Understanding these processes will provide insight into how a deeply conserved signaling molecule is regulated in space and time and inform other studies
that investigate the developmental and disease-related impact of improper regulation of the Wingless pathway.
Abstract:

Terahertz spectroscopic imaging is an emerging imaging technique that has many potential uses in the biomedical field. Since terahertz radiation is harmless and non-destructive to living cells, imaging can be done on a wide variety of subjects. However, THz imaging usually suffers due to environment effects, such as water. In order to circumvent these shortcomings, we will seek novel mathematical analysis methods, such as independent component analysis (ICA), to improve image qualities and to obtain meaningful information. ICA works by taking a series of signals composed of multiple independent sources and performing statistical calculations to draw out each source from the mix. By doing this, we expect to take a reading in rather complex biological environment and draw out the relevant terahertz signals of interest without perturbation. The research goal of this project is to develop an ICA algorithm to highlight the distinction in imaging reconstruction of different tissues including tumors. The first task of water signal separation was performed on scans of air at varying humidity. Before performing ICA, the time domain signal was sent through the Fast Fourier Transform (FFT) algorithm to obtain the frequency domain signal. The water signal was successfully extracted from the mix, verifying the ICA algorithm. The next goal was to apply the ICA algorithm to distinguish between two mixed samples. Mixtures of two powders at various ratios were measured. The ICA algorithm was able to separate out characteristic signals of the two materials from the mixture’s signal. Next, the ICA code is modified to analyze not only a single point but a 2D image. At each pixel in the 2D image, a time domain measurement is taken and ICA is applied to its Fourier transform. The 2D analysis is used to measure phantom skin samples that model cancerous skin tissue. These phantom samples are made from an agar mixture with various ratios of scattering and absorption materials added to model layers of skin and the cancerous area. We aim to analyze the image of the phantom sample and separate out the signals from the modeled cancerous skin from those of the surrounding modeled healthy skin.
Abstract:

Parkinson's Disease (PD) is a common and devastating age-related neurodegenerative disease of the dopaminergic (DA) neurons. As the age of individuals increases, so does the incidence of proteotoxic stressors (proteins which produce deleterious effects) such as α-synuclein (α-syn), the accumulation of which is a pathological hallmark of PD. The nematode Caenorhabditis elegans is a strong model organism for studying PD due to its invariant number of DA neurons, short lifespan (~21 days), and transparent body which make for easy observation of DA neurons in living animals. Although α-syn is not inherently expressed in C. elegans, human α-syn can be expressed within the dopamine neurons of C. elegans causing neurodegeneration in a time- and dose-dependent manner, as it does in PD. Here we propose a method of finding genes of an unexplored class that may be protective against α-syn-induced neurodegeneration.

These genes are involved in gene expression control mechanisms known as microRNAs (miRNA or mir) which function to block expression of their gene targets by binding to and shutting them down. Specifically, we focused on mir-2 which former students in our lab found to be involved in DA neuron protection. We searched several bioinformatics databases to find sequence miRNA target matches corresponding to genes that are predicted to be regulated by mir-2. These targets, which numbered in the hundreds, were systematically categorized based on their predicted functions and expression in neurons to narrow down which would be the more judicious candidates of study.

As of now, we have screened six genes, three of which were genes involved in organismal development and the other three were cell receptor related genes. To do our screen, we knocked these genes down, or in other words we blocked their expression. Of the three developmental related genes knockdown of two was found to be protective against DA neurodegeneration. Of the cell receptor related genes knockdown of all three of the genes we screened was found to be protective. The efforts to screen further candidates are ongoing and should result in more data and uncover even more potential therapeutic targets.

The next category of genes we plan to knockdown are kinases. With the initial success of our first two screens in mind, we would also like to screen more genes in the developmental class as well as the cell receptor class. To reconfirm the data from the positive hits, we plan on performing another more sensitive assay. By doing this, we hope to find the most promising targets.

As previously studied targets have not led to new treatments or drugs for PD, we contend that this approach focusing on suites of co-regulated genes represent an innovative strategy toward defining potential
therapeutic targets among a novel class of genes. This has the promise of expediting targets toward validation in mammalian models and correlating dataset with human genetic analyses.
Abstract:

Graphene is an unusual but exciting material that presents many avenues for creating disruptive technologies in nearly every industry. Thus, researchers are motivated to investigate and understand the physics that underlies graphene’s extraordinary properties. One approach involves Coulomb drag experiments, which have been applied to yield valuable information about the interaction between layers of graphene. In this project, we develop a theory of Coulomb drag due to momentum transfer between graphene layers in a strong magnetic field. The theory is intended to apply to systems with disorder that is weak compared to Landau level separation so that Landau level mixing is weak but strong compared to correlation energies within a single Landau level, in which case fractional quantum Hall physics is not relevant. We find that in contrast to the zero-field limit, the longitudinal magneto-Coulomb drag is finite and in fact attains a maximum at the simultaneous charge neutrality point (CNP) of both layers. Our theory also predicts a sizable Hall drag resistivity at densities away from the CNP.
Student Presenter: James Howard
Title: Application of air-stable palladium(II) precatalysts to Suzuki cross-coupling reactions and C-H activation of pyridine N-oxides

Abstract:
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Student Presenter: Addison Iszler
Title: Noncovalent interactions between anionic probes and PAMAM dendrimer hosts

Abstract:

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Abstract:

The solvation energy of a molecule is the energy absorbed or released when that molecule is dissolved in a solvent. Computational biologists use the solvation energy of macromolecules, such as proteins, to determine their stability for protein folding and their hydrophobicity for drug delivery. The solvation energy of a protein can be found by solving the nonlinear Poisson-Boltzmann equation (PBE). The PBE is computationally intensive to solve for large proteins. Therefore, efficient, accurate, and stable algorithms are desired.

This work focuses on improving aspects of the existing algorithms for computing the solution to the PBE. In particular, the distribution of partial charges of the protein is analyzed and a new approach taken to calculate the distribution. This will be implemented and tested using standard benchmarks and compared to the existing method.

In the calculation of the molecular surface, many triangles are generated to approximate the surface. For some densities and algorithms, the solution to the PBE diverges. The density of these triangles can be varied, and this density factor will be analyzed for its impact on the stability of several algorithms, including the alternating direction implicit (ADI) and locally one-dimensional (LOD) methods.

The protein data used to test and validate the improvements is sourced from the Protein Data Bank (PDB) archive. The improvements will also be compared to the analytically-known solution of the one-atom case. The molecular surfaces will be computed using the MSMS software package. The solutions to the PBE will be visualized using the Visual Molecular Dynamics (VMD) software package. Computation is done on the University of Alabama High Performance Computer (UAHPC).
Abstract:

The zebra mussel (Dreissena polymorpha) is an aquatic invasive species that was first introduced to North America via transcontinental shipping to the Great Lakes in 1988. In the introduced geographic range, the non-native species has had negative ecological and economic impacts through reducing plankton biomass from omnivory, and fouling boat hulls and water intake pipes. The introduced range of zebra mussels in North America continues to expand in the southwestern United States, yet the ecological effects of the non-native species in these reservoir ecosystems is unknown. The first zebra mussel infestation in Texas was discovered in 2009, and the mussels have since spread to invade numerous lakes throughout the state. Zebra mussels are efficient filter feeders which is thought to connect their colonization with changes in water quality. In this study, we analyzed the effect of zebra mussels on the water quality indicators transparency and chlorophyll a. Water column transparency and chlorophyll a were sampled in both invaded and uninvaded reservoirs in the summer of 2017. Additionally, a long-term analysis of transparency was performed using monitoring data 5 years before and after invasion for a subset of the surveyed reservoirs. There was a significant difference in transparency and chlorophyll a between invaded and uninvaded reservoirs. Invaded reservoirs had greater water column transparency and lower chlorophyll a. These differences are likely caused by effective filter feeding of zebra mussels reducing phytoplankton biomass. The results provide the first quantitative evidence that zebra mussel populations can significantly alter the water quality of southwestern reservoirs, and further highlight the need for invasion prevention and awareness in the southwestern United States.
Student Presenter: Elizabeth Kantzler
Title: Biodiversity and Mitogenomics of Deep-sea Euphosinidae

Abstract:

The deep sea is the least studied habitat on Earth. In remote regions such as the Arctic and Antarctic, little is known about the biodiversity of deep sea organisms, especially those that are small bodied. We have been characterizing the biodiversity of deep sea marine invertebrates from Iceland and Antarctica in order to improve the understanding of deep-sea marine invertebrates living in these remote regions. A specific group of invertebrates that we are researching are the segmented worms (Annelida). Even with the advancement of discoveries of new species over the years, there is still not a lot of data on annelids. In order to improve understanding on the biodiversity of this group, we have been imaging deep-sea specimens of the annelid family Euphosinidae using light and electron microscopy and conducting "DNA barcoding," to sequence the mitochondrial 16S rRNA gene. Our results reveal several distinct species from Iceland, some of which appear to be new to science. Further, we sequenced and annotated the first mitochondrial genome from a euphosinid, the Antarctic Euphosinopsis horsti. Remarkably, this species has the largest sequenced mitochondrial genome of any known annelid, which is around 22,000 base pairs. We conducted comparative genomic analyses to compare and contrast our Euphosinopsis genome with that of Eurythoe companata, a close relative of Euphosinopsis horsti. We found similarities in the number and organization of genes in the two mitochondrial genomes as well as some differences. Euphosinopsis horsti’s genome contains longer intergenic regions. Our hypothesis is that these regions are the result of viral DNA insertions. To test this hypothesis, we are screening the unannotated regions of the Euphosinopsis horsti mitochondrial genome using NCBI BLAST to find similar sequences in other genomes.
Abstract:

The iron transport protein transferrin (Tf) has been proposed to function as a detoxification agent for dietary Cr(III), carrying Cr from the blood to the tissues or ultimate release in the urine. Recently, however, the release of Cr(III) from Cr2-Tf metal has been proposed to be too slow for Cr(III) to be released during endocytosis. Using continuous wave-electron paramagnetic resonance spectroscopy (CW-EPR), the loss of Cr(III) from Cr2-Tf over 24 hours at both pH 5.5 and 4.5 has been monitored. The effects of several biological relevant chelate ligands and EDTA on Cr loss have also been examined. Cr(III) was found to rapidly dissociate from the weak Cr(III) binding site of Tf at both pH's regardless of which chelator was present, while loss from the tight binding site was appreciably slower. The rates of Cr(III) loss as a function of pH and chelator will be presented.
Student Presenter: Matthew Kiszla
Title: A Bacteriophage Response to Antibiotic Resistance in Proteus Mirabilis

Abstract:

Not Publishable
Student Presenter: Elliot Lakner
Title: Molecular Structures and Energetics of Small Palladium Clusters

Abstract:
There is a substantial interest in the study of small atomic clusters due to the role that they can play in understanding the physical and chemical properties of the bulk as well as their inherent properties, for example for catalysis. Density functional theory and correlated molecular orbital theory at the coupled cluster CCSD(T) level have been used to predict the structures and energetic properties of small (Pd)\(_n\) (n \(\leq\)20) clusters. The geometries were optimized with the B3LYP, PW91, and M06 exchange correlation functionals with the cc-pVDZ-PP basis sets. The clusters with different spin states and different geometries are calculated to determine the ground state isomer. The normalized clustering energies (NCEs) as well as the atomization energies are calculated. Single point calculations at the CCSD(T) level extrapolated to the complete basis set level at the optimized geometries at the DFT level are performed to obtain more accurate clustering energies for the smaller clusters. The results for the Pd clusters are compared with other work in our laboratory on Group 1B clusters. The NCEs can be extrapolated to predict the energy of sublimation of the bulk. The work is supported by the DOE Office of Science, Basic Energy Sciences.
Abstract:

The Human Proteome Project is the latest initiative to try to understand more about the human body at the molecular level with the goal of mapping the entire human proteome leading to an enhanced understanding of protein function in cells. Analyzing amino acids, the building blocks of proteins, is done through tandem mass spectrometry, because it is a cost-effective, reliable, and reproducible method for identifying and characterizing proteins. It has been shown that adding trivalent metals to peptide solutions for electrospray ionization mass spectrometric analysis can increase the intensity of multiply charged species. This increase can result in more sequence information from the fragmentation patterns. For example, Cr(III) has been shown to greatly increase the presence of multiply charge species. Fe(III) has been shown to moderately increase this effect, while Al(III) has been shown to have no effect. Why is there such a difference between 3+3 cations of similar size? In this study, density functional theory with the B3LYP exchange-correlation functional is being used to predict the interactions between solvated Al(III) and neutral and anionic amino acids. Protonation was shown to occur on both the C-terminus and the N-terminus, and diprotonation was also considered for species with highly basic sites. Certain amino acids in the neutral state, arginine, histidine, lysine, glutamic acid, asparagine, and glutamine, are predicted to have enhanced protonation whereas the amino acids with aliphatic and hydroxyl side chains are not predicted to have enhanced protonation.
Abstract:

The mangrove rivulus is a species of fish with a unique reproductive system. Rivulus exists largely in hermaphroditic form, utilizing a process known as self-fertilization to effectively generate offspring that are genetic clones of itself. In addition, rivulus sexual phenotypes are thought to be completely driven by the environment, with temperature driving the development of either males or hermaphrodites at the embryonic stage, and triggering sex change from hermaphrodite to male in the adult stage. However, we still are lacking details on the expected sex ratio under varying temperature regimes, and on whether there is a genetic basis for the sensitivity of sexual development to temperature. Our lab has generated 399 discrete, isogenic lineages of the rivulus. Each of these lineages has a novel genotype and continuously self-fertilizes to produce "cloned" offspring. We can, therefore, drive the development of males and hermaphrodites with identical genomes; and we can assess differences among genotypes in their propensity to respond to environmental cues with a change in sexual phenotype.

To evaluate the intricacies of temperature-dependent sex determination, our lab conducted two experiments. First, examining primary male production, we exposed rivulus embryos to 20, 25, and 30 degrees Celsius and allowed the embryos to grow into adulthood. Once this occurred, adult sexual phenotypes were assessed based on external appearance and gonad morphology. Our results confirmed our hypothesis that temperature does have a demonstrable effect on sexual phenotype, generating significantly more males at cooler temperatures. In our second experiment, we focused on secondary male production. This refers rivulus' ability to alter their sexual phenotype during adulthood. In our study, we observed the probability that rivulus would undergo a sex change when placed in warm environments of 26 degrees Celsius. We utilized many different rivulus lineages in this experiment to potentially uncover a connection between genotype and sexual plasticity. The results of our study illustrated that substantial genetic variation underlies sexual plasticity in rivulus and that the incidence of sex change varies predictably as a function of geographic location, with lineages derived from southern populations changing sex more frequently than lineages derived from northern populations.
Abstract:

Weight gain is one of several symptoms associated with metabolic syndrome in humans, which may lead to presentations such as diabetes, dyslipidemia, or hypertension. The implication that variance in genetics paired with diet have on the development of metabolic syndrome are of particular interest in the field of personalized genetics and nutrition. The fruit fly, Drosophila melanogaster, can produce useful data concerning changes in body composition caused by perturbations in diet because it shares metabolic homologies with humans. In this study we focused on four candidate genes (nwk, Rdl, Slc45-1, CG13315) that were selected based on their genotype-by-diet interactions. These genes were identified by genetic mapping through stressing a large panel of genetic lines by feeding them a high fat diet, to simulate the modern Western diet in humans. Differences in weight between the high fat and normal diet treatment were measured and yielded a statistically significant difference between the diets, genes, and, most importantly, the gene-by-diet interactions. Following this, qRT-PCR amplification of these genes was performed to determine if changes in the expression of these genes are responsible for the differences in weight. These results hold the potential to inform future studies in the area of personalized genetics geared toward nutritional optimization in patients with metabolic syndrome.
Abstract:

The correlation between interpreting visual illusions and the autism spectrum disorder (ASD) has been studied since at least the mid-1990's. These studies have shown that subjects with ASD are better able to interpret visual illusions and not be "fooled". In mangrove rivulus fish, Kryptolebias marmoratus, previous studies have revealed that individuals that lose aggressive contests behave more submissively and become socially withdrawn. Previous research also showed that expression of the SH3 protein, commonly associated with autism risk, is strongly upregulated in the brains of individuals with losing experience. To determine whether mangrove rivulus fish might be an emerging model for autism research, we aim to assess the effects of social experience on behaviors that align more directly with autism - interpretations of visual illusions. We hypothesize that subjects with previous losing experiences will be less likely to be "fooled" by visual illusions than subjects with a winning or control experience.

To assess how mangrove rivulus fish interpret visual illusions, we first need to confirm whether they can associate visual cues with reward. We will challenge thirty mangrove rivulus fish to memorize the location of the petri dish containing water and food resources in a 5-gallon tank with a layer of wet sponge. This test is designed to simulate rivulus' natural environment, in which individuals are required to search for water resources to survive during the low tides. Above each petri dish will be either a long line, or a short line, which incorporates the visual cue that we want the fish to be trained to associate with rewards. During the training phase, fish will be divided into two groups: one group will be trained to associate the water resource with the short line, and the other group will be trained with the long line. After three training sessions, the fish will be tested. During the testing phase, the positions of the short and long lines above the petri dish will be switched, and both petri dishes will be empty. This maneuver will be performed to see if the fish utilize spatial learning memory (memorize the location/direction of water) or association memory (associate the landmarks with water). Once we confirm that rivulus can use visual cues to locate water resources, we will test winners, losers, and controls differ in their ability to decipher Müller-Lyer visual illusions. To achieve this goal, we will replace the long and short lines with a visual illusion that makes it seem as if one line is longer than the other (despite the lines being the same length). This will allow us to determine whether individuals with previous losing experiences are less likely to be "fooled" by visual illusions. We predict the fish with social losing experiences will have a better capability of distinguishing between the two different Müller-Lyer visual illusions, thereby providing strong support for using rivulus as a vertebrate model for research into the neurobiological mechanisms underlying autism spectrum disorder.
Abstract:

Recent advances in solid state physics have led to the discovery of fundamental relationships between charge currents and spin currents. These relationships are due to the spin-orbit moments of electrons. Among these effects are the Spin Hall Effect—the accumulation of spins due to a charge current—and the Inverse Spin Hall Effect—which represents the accumulation of charges due to a spin current. Of the various characterization experiments, the most popular method is using Ferromagnetic Resonance to generate and pump a spin current into a non-magnetic material, resulting in a measurable voltage due to the Inverse Spin Hall Effect. This data is then used to develop models for the phenomena. A macroscopic model is used to analyze experimental phenomena—how the delivered power decays from the signal generator to the sample. Developing the microscopic model will allow for analysis of what occurs within the sample material itself, for various experimental conditions.
Abstract:

Galaxies can only be viewed from one perspective and at one moment in time. These simulated galaxies are created by evolving a mock universe through time in a supercomputer using known physics equations. Then, synthetic images of this simulated galaxy are produced using python code and the SUNRISE software. This software is what turns simulations of mass into light which can be observed. The SUNRISE software records which wavelengths of light are emitted by a star, and which wavelengths of light are absorbed by the clouds of gas and dust present within a galaxy. The software then produces a visible color image of the galaxy. Once this is complete, we can analyze the images for properties such as the galaxy's shape and color and compare it to observable galaxies. By comparing the simulated galaxies to the actual galaxies, we are able to better understand how galaxies are created.
Abstract:

Hox proteins control regional development identity in multicellular animals. In Drosophila melanogaster, Abdominal-B (Abd-B) is the most posteriorly expressed Hox protein and is expressed at different levels in a posterior to anterior gradient from the fruit fly's abdominal segments A7 to A4. The Yoder lab has shown the Abd-B protein activates expression of a transcription factor, Doublesex (Dsx), by directly binding to specific enhancers. Enhancers are stretches of DNA associated with individual genes that control when, and in what cells, a gene is expressed. Gene expression involves making a mobile copy of a gene, mRNA, that serves as instruction for synthesizing proteins. Some of these proteins are transcription factors, which bind to specific DNA sequences to control the rate of mRNA synthesis, and thus the rate of certain proteins' production. Dsx encodes the founding member of a deeply conserved transcription factor family that promotes sexual differentiation. Dsx generates sex-specific isoforms that control somatic sexual identity. The Dsx protein expression is sexually dimorphic and is alternatively spliced to form male and female isoforms (Dsxm and Dsxf). Dsx is believed to regulate Abd-B and itself, by enhancing both expression levels in the male isoform and repressing both levels in the female isoform. Our lab has already shown Dsx is enriched in male A7 compared to female A7 approximately 1.5 fold (Wang and Yoder, 2012). Our lab seeks to test whether the Dsx isoforms control expression levels of Abd-B and Dsx in this same pattern in the fly embryo. To test this, our lab will create different transgenetic fly lines using the gal4 uas driver system to drive expression of both Dsx isoforms where certain proteins of known regional identity are expressed. We will collect and antibody stain embryos from these transgenetic lines, allowing us to visually and systematically compare the expression levels among Dsx isoforms and Abd-B. We expect to see the same pattern of expression in the fly embryo as in the adult.
Abstract:

Marine reserves are an increasingly popular conservation tool used around the world to manage fisheries and protect aquatic habitats. The creation of a marine reserve is typically the first solution to overfishing and habitat destruction, due to the foundational theory that marine reserves protect source populations that could repopulate areas most directly affected by heavy fishing. Queen Conch is one of the most important economic resources in the Caribbean, yet due to overfishing, their populations are rapidly declining. Marine reserves have been put in place to protect the species from drastic disappearance. Although these reserves are a primary conservation tool, there has been an ongoing debate about the effectiveness of such. The purpose of this research is to compare literature regarding effective marine conservation with my own data collected while on a field course in Belize in order to develop better strategies for improving queen conch conservation efforts.
Abstract:

The resiliency effect, whereby a subset of individuals within a population respond more favorably to stress than the rest of the population, has long been observed as a consistent, yet poorly understood phenomenon across living species. This study aims to identify the intrinsic molecular and cellular factors that modulate the protective effects toward a specific stressor: the toxic misfolding of the human a-synuclein (a-syn) protein, which is implicated in the degeneration of dopaminergic (DA) neurons in Parkinson's Disease. Prior published work from our group has demonstrated that predictable, age-dependent, dopaminergic neurodegeneration can be achieved in isogenic, clonal populations of the nematode Caenorhabditis elegans by overexpressing a-syn via an integrated transgene. Utilizing this model system, we hypothesize that genetic and epigenetic factors, along with downstream targets of these factors, can be discovered that underlie the resilience we observe in select animals that combat the stress of a-syn more effectively than others. By using the Basal Slowing Response (BSR), a quantifiable behavioral readout based on the dopaminergic neuronal integrity and subsequent signaling, we have developed a trans-generational behavior enrichment scheme where individuals expressing the human wild-type a-syn are selected for resilience from its induced proteotoxic stress. As C. elegans are hermaphrodites, by selective choice of self-propagating animals exhibiting a BSR more like wild-type across multiple generations, we are able to produce heritable enrichment that has been found to last through four or more generations. After this, it resets and resembles the defective BSR that individuals expressing a-syn in the DA neurons characteristically exhibit. Alongside examining the neurodegeneration of DA neurons in strains of C. elegans over-expressing candidate neuro-protective genes, as well as strains under-expressing these same genes via depletion by double-stranded RNA interference (RNAi), a better understanding of the innate cellular mechanisms that resilient individuals employ to actively combat the proteotoxic stress of a-syn in dopaminergic neurons can be ascertained. We envision these studies as laying the groundwork for identification of new classes of therapeutic strategies that focus on enhancement of overall stress responsiveness vs. correction of specific genetic defects, as is currently the most common strategy proposed for intervention.
Abstract:
The genus Vaccinium includes many agriculturally important fruits such as cranberry, blueberry, huckleberry, and lingonberry. This group of small shrubs includes 223 species and is found across the Northern Hemisphere, preferring cooler areas and acidic soils. Despite their popularity and widespread distribution, relationships among Vaccinium species are not well understood. Hybridization is likely common, and it has been used extensively in improving blueberry cultivars to produce desirable traits. In this study, we used genome sequencing data to assemble the gene space of 37 chloroplast genomes representing 30 Vaccinium species, a putative hybrid, and the outgroup Rhododendron delavayi. Many of the species fall into clades demonstrating the historical taxonomy of the genus. Interestingly, the section Cyanococcus, which includes the commercial blueberry, is very unresolved and has low support values for relationships. The lack of resolution is likely the result of hybridization, as evident by the lack of monophyletic clades for many species, and a relatively recent diversification. This first look at relationships in the blueberry genus will help elucidate the evolution of these common, woodland species. Future work will add additional taxa with extensive sampling from Alabama and the Southeast to further explore the evolution of this native fruit.
Abstract:

Within the human digestive tract, thousands of bacterial species comprise the microbiome, an ecological environment that significantly contributes to host health. While most bacteria within the microbiome beneficially interact with the host, some bacteria can produce toxins that damage intestinal cells. Although effective immune responses can neutralize these pathogens, chronic responses can contribute to disease. For instance, Parkinson's disease (PD), associated with dopaminergic neurodegeneration, has been linked with differing amounts of Lactobacillus and Bacteroides genera in the gut microbiomes of PD patients, often years before onset of clinical symptoms. In this project, a Caenorhabditis elegans model of neurodegenerative disease and cellular stress response is used. C. elegans, an anatomically-transparent nematode measuring approximately 1mm in length, is a viable model for this study due to its small number of easily visible neurons and its ability to be genetically mutated. In this case, transgenic C. elegans have been engineered to display the dopaminergic neurodegeneration typically associated with PD by overexpressing the gene encoding a human protein called alpha-synuclein. Accumulation of alpha-synuclein over the course of aging is a pathological hallmark of PD. The innate immune response to stress is also highly conserved between these worms and humans. Using this model, the relationship between the metabolic influences of Lactobacillus and Bacteroides bacterial species on immune pathways associated with stress sensitivity and degeneration of dopamine neurons in C. elegans was investigated. To do this, metabolites were isolated and purified from a number of select Lactobacillus and Bacteroides species known to be present in varying amounts in the microbiomes of PD patients to which the worms were exposed for set intervals and were subsequently assessed for activation of stress pathways and neurodegeneration. It was found that exposure of C. elegans to all of our tested species of Lactobacillus metabolite led to a significant increase in alpha-synuclein associated dopaminergic neurodegeneration and a subset of species also triggered stress reporters. In all, our findings suggest that Lactobacillus associated metabolites found within the human intestine can activate a number of cellular stress response pathways through their basic metabolic processes and can increase the levels of neurodegeneration exhibited in a worm PD model. Experiments testing the cellular stress response and neurodegeneration of worms exposed to Bacteroides species are ongoing. These studies represent the first time any specific bacterial component of the human microbiome has been demonstrated to directly impact dopaminergic neurodegeneration in an animal model system.
Student Presenter: Clare Ols, Charles Pitsenberger, Vanessa Marshall
Title: DNA Barcoding as a Tool to Assess Pollinator Diversity in a Fragmented Landscape

Abstract:
Pollinators, particularly bees, are important parts of the global ecosystem. However, they are increasingly subject to anthropogenic threats such as habitat fragmentation, pesticide use, and the effects of climate change. Increased understanding of species composition, abundance, and community interactions of native bees is a critical tool in preserving pollinator populations. We examined how landscape variation affects local pollinator diversity at the University of Alabama’s Arboretum (https://arboretum.ua.edu/). To evaluate diversity, pollinator specimens were collected using pan traps from the same 38 locations once a month from September 2015 until July 2016. Locations consisted of three unique habitat classes within the Arboretum - garden and native prairie, open weedy areas adjacent to native woodlands, and ornamental gardens with flowering shrubs and trees. Following collection, specimens were identified to species-level using a combination of morphological examination and "DNA barcode" sequencing. We examined patterns of alpha and beta diversity across sampling locations and over time. This examination of pollinator diversity over multiple spatial and temporal scales will aid in determining the best methods to improve pollinator habitats in the region and mediate threats to vulnerable pollinator populations.
Student Presenter: Emily Pabst
Title: Are Ultraconserved Elements an Informative Phylogenetic Marker in Molluscs?

Abstract:

Mollusca is a very important phylum of invertebrates with over 100,000 described species in eight morphologically disparate major lineages. Molluscs have many significant uses to humans as food, producers of pearls and shells, and as model organisms in studies of brain organization, learning, and memory. However, they can also be harmful as pests of agriculture, invasive species that can damage ecosystems, and vectors of parasites. Despite their importance and prevalence, there is not a clear consensus on the evolutionary relationships among the eight major lineages of molluscs. Earlier research has found that the genomes of many animals contain ultraconserved elements (UCEs), typically regulatory sequences that allow targeted sequencing. The use of ultraconserved elements as a molecular marker for reconstructing evolutionary relationships has expanded possibilities for phylogenetic studies because they have recovered well-supported phylogenies that provide information on both shallow and deep relationships. The goal of this project was to test whether or not UCEs are present in mollusc genomes and whether they have utility for further resolving molluscan relationships. We used the Phyluce pipeline developed by Dr. Brant Faircloth to screen for potential UCEs in the genomes of 10 molluscs and five other taxa representing putative close relatives to Mollusca. We found 4,759 UCEs shared among at least 10 taxa sampled in our study and 325 shared across all 15 organisms used in the analysis. Using a final set of 1,000 UCEs, we assembled and analyzed a matrix with 2,818,367 nucleotide positions and 75% completeness, generating a tree with generally well-supported relationships that are consistent with the current understanding of molluscan evolution. These results demonstrate that UCEs are an informative phylogenetic marker in molluscs. Our future plans include sequencing the genome of an aplacophoran, a group of mollusc not represented in our dataset, and re-constructing a tree with this and other additional molluscs to further discern how these taxa are related. We can then deduce which species likely share similar characteristics, allowing us to find additional biomedically important species or identify others that might be potentially problematic.
Student Presenter: Anna Parker
Title: Chromium-based matrices for analyzing acidic peptides by MALDI mass spectrometry

Abstract:

Procedures for sequencing peptides by mass spectrometry have almost all been developed for basic peptides. For acidic peptides, the techniques are much less developed, and the mechanisms by which the peptides fragment in the gas phase are less well understood. These laboratories have found that the addition of chromium(3+) sources to basic peptides in matrix-assisted laser desorption ionization (MALDI) mass spectrometry experiments led to enhanced protonation, generating more ions and enhanced signals. The current project was designed to developed chromium-based matrices (rather than just adding chromium to a matrix) for MALDI mass spectrometry. Based on the general requirements for a MALDI matrix (chemical moiety that will absorb laser light, a carboxylate functionality that will decompose to generate carbon dioxide, and a source of protons), trinuclear basic chromium carboxylate assemblies and derivatives of [Cr(picolinate)2(H2O)2]⁺ were examined as potential MALDI mass spectrometry matrices.
Student Presenter: Graham Parker
Title: Investigating the Intersection of Glutamatergic Neurotransmission and Dystonia using C. elegans

Abstract:
Not Publishable
Student Presenter: Elizabeth Payne  
Title: Drought in Alabama: An Assessment of 32 Downscaled Models

Abstract:

Alabama is no stranger to droughts, and because the state is heavily dependent on agriculture, droughts can have a severe impact. The ability of 32 downscaled CMIP5 models to simulate observations of consecutive dry days (periods without measurable precipitation) from 1950-2005 across the State of Alabama is assessed using skill scores and significance tests. Longer periods of dry weather likely have a greater impact on agriculture during the growing season, therefore, the analysis is divided into warm and cold seasons. The models are then projected to 2050-2099 under various emissions pathways to examine future changes in consecutive dry days. Preliminary results indicate the models simulate observed dry spells well but there are significant differences between the best and worst performing models. The findings of this study help identify models that better simulate observed dry spells and predict the length of dry spells in the future.
Student Presenter: Rylee Perentis
Title: Investigating a role of DAF-7/TGFβ mechanism on neurodegeneration susceptibility in response to a bacterial metabolite in a C. elegans Parkinson's model.

Abstract:
Behavioral changes can represent the physiological stress response to alterations in internal or external environments. The nervous system is the main center of physiological response to environmental changes, which alters the properties of specific neurons to promote protective avoidance behavior. However, chronic alteration of neuronal signaling could cause homeostatic cellular imbalances, resulting in the progression of neurodegenerative disorders, such as Parkinson’s disease (PD). Although analysis of genetic defects impacting neurodegenerative disorders has significantly advanced mechanistic understanding of PD, genetic determinants only account for 5-10% of its causes. Given the predominance of sporadic PD among patient populations, environmental toxins may induce the disease, although their nature is largely unknown. Patients with PD have demonstrated a lower number of dopaminergic neurons as well as defective mitochondrial function. We have identified that a metabolite produced by Streptomyces venezuelae causes age- and dose-dependent dopamine neuron degeneration in Caernorhabditis elegans as well as impairs Mitochondrial Complex I. C. elegans is a nematode animal model system often used to study PD because of its transparent anatomy and short generation time. Here, we determine, using behavioral assays, that chemosensory detection of this metabolite promotes avoidance behavior in C. elegans. A neuromodulator DAF-7/TGF-β is expressed when neurons are exposed to noxious environmental compounds. An indicator model of C. elegans uses DAF-7/TGF-β fused to the green fluorescent protein (GFP), which then exhibits fluorescence under particular environmental stimuli. By examining the GFP expression patterns in neurons, we were able to determine that the metabolite activates a G-protein-signaling pathway in the ASJ chemosensory neuron pair that induces expression of the neuromodulator DAF-7/TGF-β, which then enhances susceptibility to DA neuronal death. Importantly, over 50% of all marketed drugs effect G-protein coupled receptors. We also examined the relationship between the DAF-7/TGF-β pathway and mitochondrial stress induced by the metabolite using the AMP mimetic drug 5-aminoimidazole-4-carboxamide ribonucleotide (AICAR). It was hypothesized that activation of AMPK in response to mitochondrial stress led to the initiation of the DAF-7/TGF-β avoidance behavior. However, it was determined that there is an alternative contributor to the avoidance response. Further studies will facilitate our understanding of specific aspects of evolutionarily-conserved components of neuron function, as well as identify targets that may be modulated for potential therapeutic purposes in the future.
Abstract:

Living organisms synthesize millions of structurally diverse proteins to execute critical roles in metabolism, immune response, respiration, transport and storage. Primary structural determination is integral in understanding the mechanisms by which proteins carry out their diverse and vital roles within living organisms. Mass Spectrometry is a technique commonly applied to analyze biological molecules such as peptides and proteins. This technique employs mass analysis to characterize peptides, which are small amino acid chains that compose proteins.

In order to use mass spectrometry to analyze molecules, these molecules must become charged. Peptides can acquire positive charges via protonation, metal adduction, or derivatizations that append a fixed charge. For large peptides and proteins, high charge states are desired to force ions into a lower mass-to-charge region, increase fragmentation, and improve mass accuracy obtained.

This work focuses on the protonation of biological peptides during electrospray ionization (ESI) for analysis in the positive ion mode. Our group has previously demonstrated that the addition of Cr(NO₃)₃ can promote multiple protonation during electrospray ionization of heptaalanine (A₇). The goal of this work is to investigate the effects of Cr(NO₃)₃ on the protonation state of biological peptides after electrospray ionization.

The set of twenty biological peptides for this study was chosen to possess structural diversity in size, sequence and covalent modifications. Solutions of these peptides will be prepared at with varying molar ratios of Cr(NO₃)₃ added, then subjected to electrospray ionization. A variety of electrospray parameters were systematically varied in order to optimize the charge state distribution obtained for the biological peptides. The spectra obtained were analyzed seeking to understand the mechanism by which chromium nitrate promotes protonation, the optimal parameters for enhanced protonation of various biological peptides, and potential sample preparation methods for native sample analysis.

The results obtained suggest that the addition of Cr(NO₃)₃ can alter the charge state distribution obtained for peptides that form primarily singly or doubly protonated ions. Addition of Cr(NO₃)₃ to peptides that readily form triply or quadruply protonated ions without solution additives does not influence the charge state distribution observed. This presentation addresses various findings of this study and its implications.
Abstract:

Elliptical galaxies are objects with an approximately ellipsoidal shape, theoretically formed by galaxy mergers and other slower processes. Mergers are more likely in more dense environments. As such, the relationship between galaxies' sizes and luminosities is theoretically dependent upon the density of galaxies in their surrounding environments. This work is primarily concerned with measuring the evolution of this relation amongst ellipticals across the last 7 billion years. Analysis was restricted to elliptical galaxies due to the important role of mergers in their formation history, and the relative ease of modeling the galaxies and computing sizes. Specifically, a large focus was placed on automating the otherwise arduous size measurement process to accommodate significant (N = 5000) samples of galaxy images. Though final results are pending, we show preliminary results (N = 2000) of these measurements in order to compare the strength of this correlation across environments and characterize the importance of mergers in galaxy growth.
Student Presenter: Carter Pruett
Title: Extracting Genetic Information from Alabama Molluscs

Abstract:
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Abstract:

Nutrient availability has a direct effect on rates of primary productivity in river ecosystems. Research has shown that Nitrogen and Phosphorus are the most critical nutrients for algal production, and are often limiting or co-limiting in streams. A growing body of research has demonstrated that benthic macroinvertebrates such as Unionid mussels can affect nutrient limitations as their excretions can serve as important sources of limiting nutrients in streams. Mussels are typically found in diverse, dense aggregations in river ecosystems. Research has shown that different species have different stoichiometric characteristics, resulting in differing N:P ratios in their excretions. Mussel community density and species composition has been shown to affect algal primary production within a stream. In this study, we sought to determine the nutrient limitations of the Sipsey river, and the effects of varying mussel densities and species compositions on algal primary productivity.

In order to determine the nutrient limitations in the Sipsey river ecosystem, we conducted an experiment using nutrient diffusing substrates, consisting of cups of agar enriched with either N, P, both nutrients, or a non-enriched control. We capped the cups with fritted glass disks, which allowed nutrients to diffuse from the agar to the surface. After incubating the cups in the stream, we analyzed algal growth on the glass disks, using levels of chlorophyll-A as an indicator of productivity. Enrichment with both N and P had the greatest effect on chlorophyll-A levels, indicating that the Sipsey river is NP co-limited.

We examined the effects of mussel density and species composition by setting up model communities of mussels in the Sipsey. We used enclosures stocked with Fusconaia cerina, Quadrula asperata, both species, or sham mussels made from mussel shells filled with sand as a control, using densities of either 6, or 12 mussels. We incubated fritted glass disks in the enclosures, then analyzed chlorophyll-A concentrations to determine algal growth. Both species of mussel increased primary productivity, with higher densities having more of an effect, and communities stocked with both species had the greatest effect on algal productivity.

We found that the Sipsey river system was NP co-limited, indicating that both nutrients are needed to stimulate primary productivity. The enclosures experiment showed that mussel communities increase primary productivity in the Sipsey, with high density, mixed communities having the most effect. Mixed communities may have higher effects because of the differing stoichiometric characteristics of mussel species. Differences in species tissue stoichiometry have been shown to result in differing nutrient ratios in their excretions. A diverse community may produce an N:P ratio more suited for algal growth needs than a single community species alone. This study confirmed prior studies indicating that mussel density and community structure have a significant effect on primary productivity in river ecosystems. Algae are an important resource in river
ecosystem food webs, and, due to their effects on algal productivity, mussel beds may play an important role in ecosystem health and productivity.
Abstract:

We apply a deep neural network (DNN) algorithm to the data from the EXO-200 experiment. In the studied case, the DNN is able to classify events as neutrinoless double beta decay signals or other background events directly from the waveforms with relatively high accuracy. Additionally, we gain insight into the internal workings of the DNN by generating the images that, when passed as inputs to the DNN, maximally stimulate the neurons for each type of event. Such a technique may help reduce the perception that DNN algorithms are a "black box" method of analysis, compared to conventional high-level algorithms, such as binary decision trees.
Student Presenter: Ryan Rogers
Title: Determining the Age of Metamorphism of New Zealand's Lower Crust Using Isotope Geochronology

Abstract:

We report new geochemical data for igneous rocks in the southwest corner of the South Island of New Zealand known as the Western Fordland Orthogneiss (WFO). The Worsley Pluton, about one third of the WFO, intruded into the lower crust 126 to 120 million years ago (Ma) based on U and Pb isotope results for zircon found in the pluton (Mattinson 1986). Additional isotope data from zircon and another mineral titanite show that additional magma intruded between 118 and 115 Ma. This was followed by heating of the Worsley Pluton at high pressure (metamorphism), which caused recrystallization to new minerals 115 to 108 Ma (Stowell et al. 2014). However, it is still unclear exactly how and when the pluton was affected by metamorphism.

New Sm, Nd, U, and Pb isotope data from the western part of the Worsley Pluton constrain the timing of intrusion and of the metamorphism of the pluton in this part of the lower crust. New data are from the north side of Bligh Sound ~4 km inland from the Tasman Sea (15NZ25) and the southeastern slope of Mount Lonsight approximately 4 km east-northeast of the first sample (P76580). New U-Pb radiometric ages of ca. 121.4±1.5 Ma (California State University at Northridge) and 115.2±0.9 Ma (University of New Brunswick) were determined by laser ablation mass spectrometry of zircon in sample 15NZ25. The ca. 121 million-year-old zircon outside the garnet are interpreted to date original intrusion and the ca. 115 million-year-old zircon that are included in garnet are interpreted as metamorphic. A garnet Sm-Nd age of 112.7±2.3 Ma for this sample determined by thermal ionization mass spectrometry (UA RadIs: https://radis.as.ua.edu) confirms that zircon and garnet grew during metamorphism. Two additional garnet Sm-Nd ages of 114.3 ± 3.0 Ma and 104.9 ± 3.0 Ma (RadIs) for sample P76580 indicate protracted high temperatures in the lower crust. We hypothesize that the younger of these two ages is attributed to dissolution of minerals during cooling. Our new ages indicate that granulite facies metamorphism began 5 to 7 million years after intrusion of the Worsley Pluton and continued for ca. 10 million years.
Student Presenter: Sebastian Rowe  
Title: Determination of the Role of the C-Terminal Domain in Methyltransferase Proteins from Erythromycin Resistant Bacteria

Abstract:
Recently, Streptococcus pneumoniae, the leading cause of pneumonia and meningitis, has developed resistance to antibiotics in the erythromycin group. It has been shown previously the Erm gene family codes for methyltransferases which provide erythromycin resistance through methylation of adenosine residues in ribosomal RNA. Throughout the family, a majority of proteins are composed of two domains (independently functioning units), ascribed the terms C-terminal and N-terminal. ErmC and ErmE genes represent genes from pathogenic and antibiotic producing resistant bacteria respectively, and are model genes for the Erm family. The function of the C-terminal domain of Erm proteins has been hypothesized to be protein stabilization. Constructs of ErmC and ErmE without the coding region for the C-terminal domain (labeled ErmC∆CTD and ErmE∆CTD) are shown to have drastically reduced resistance in vivo. We also show ErmC∆CTD has reduced (but existent) solubility compared to the wild type protein. Purified ErmC∆CTD is folded but has no methylation activity in vitro. We conclude the previous hypothesis on the function of the C-terminal domain for solely stability is an incomplete description and the domain plays some non-trivial role in enzyme functionality.
Student Presenter: Benjamin Runge
Title: Examining Spiral Arm Pitch Angles in Relation to Physical Galaxy Characteristics with SpArcFiRe

Abstract:
Not Publishable
Title: rasV12 Activation in the Developing Drosophila melanogaster Abdomen as an in vivo Model for Cancer Metastasis

Abstract:

In a constant state of regeneration, the majority of human cancers (e.g. skin, lung, colon and breast) are of epithelial origin. The more divisions a cell completes, the more likely cancerous mutations will arise. Although cancer is deadly, patients with primary tumors usually have a high survival rate when surgical removal of the tumor is possible. In individuals with secondary tumors, the primary tumor evolves the ability to migrate as independent cells, invade surrounding tissues and establish deadly secondary tumors. Because of the deadly nature of metastatic cells, one goal of cancer research is to characterize genetic mechanisms that promote invasiveness. However, there are few established genetic models that allow investigation of such mechanisms in vivo. The proposed work aims to establish a new model for cancer invasiveness in the developing abdomen of the fruit fly Drosophila melanogaster. Drosophila are holometabolous insects that undergo complete metamorphosis like a caterpillar turning into a butterfly. In the developing abdomen, the growing epithelia that will generate adult body structures interact with and replace the larval epithelium. In many ways, this growth parallels that of primary tumors. Previously the Yoder lab showed that forced expression of a human cancer mutant gene (rasV12, found in 30-50% of all human cancers) efficiently promotes not only over-proliferation, but also cell migration and invasion of surrounding tissue. This project will continue these investigations by addressing whether the mutated cells themselves invade surrounding tissues, or whether the mutant cells influence normal cells to become invasive. Finally, this project will establish a protocol for live-imaging developing pupa in order to establish one of the only in vivo models of invasiveness.
Student Presenter: Keaton Schmitz
Title: Characterization of Gut Stem Cell biology in a novel mutant for the brain tumor gene in Drosophila melanogaster

Abstract:
Not Publishable
Student Presenter: Neil Shimer
Title: Exploration of Improved Preparations of Stereodefined Imidoyl Halides

Abstract:
Not Publishable
Student Presenter: Caris Smith
Title: Computational Chemistry Studies of Modular Approaches to Contemporary Complexants of Separations

Abstract:

Not Publishable
Student Presenter: Brian Smithers
Title: Development of a Bioassay System for Evaluation of Coordinated Dopamine and Double-stranded RNA Transport in C. elegans models of Parkinson's Disease.

Abstract:
Not Publishable
Student Presenter: Sydney Sudderth, Mae Crumbley
Title: Temperature-Dependent Gonad Development in Mangrove Rivulus Fish

Abstract:

Have you ever considered why you are a certain sex outside of which chromosomes you possess? Do you think it’s possible to change an organism’s sex by altering the temperature in which the embryo develops? The mangrove rivulus fish (Kryptolebias marmoratus) exist primarily as hermaphrodites with both female and male sexual organs, while males exist in much lower frequencies. Hermaphrodites develop when embryos experience warm temperatures, while males develop when embryos experience cool temperatures; this occurs even if the embryos have identical genomes. We seek to address three goals: study sexual plasticity with a specific focus on temperature-dependent sexual determination, evaluate the period during embryonic development in which the fish are susceptible to temperature effects on sexual development, and determine if there is a genetic basis for sensitivity to early-life temperature. Environmental effects, such as the temperature in which an embryo matures, can have a substantial impact on an individual, altering factors such as sexual phenotype, morphology and behavior. The ability to be sexually plastic- to have the possible option to alter sexual orientation- provides an adaptive benefit for many organisms, such as the mangrove rivulus. While there is an inherent energy cost to any individual investing in such a transformation, temperature-based embryonic sexual flexibility allows mangrove rivulus the possibility of assuming the sex that confers highest fitness. It is hypothesized that embryos incubated in cold temperatures will exhibit a predominately higher male percentage as an adaptation to conserve energy typically expended on the maintenance of hermaphroditic sexual tissues. Using incubators, the eggs of different lineages of these fish were exposed to a normal temperature as well as a "cold" temperature environment. Once hatched, these fish were subjected to varying time treatments including immediate, 30, 60, 90, and 120 day treatments, and preserved at the assigned time period for processing. The fish were then decalcified, dehydrated, embedded in wax, sectioned in thin slices, and stained. The stained tissues sections were then examined to determine the progression and type of gonadal development in each of the treatments. These data will determine whether environmental temperature affects sex determination of an embryo before hatching, the timing of male/hermaphrodite gonad development, and whether there is a genetic basis to temperature sensitivity.
Title: Convolutional Neural Networks as a Tool for Data Analysis in the MoEDAL Experiment

Abstract:

The MoEDAL experiment searches for magnetic monopoles and other highly ionizing particles at the Large Hadron Collider at CERN, the European Organization for Nuclear Research. MoEDAL's findings could help answer fundamental questions about the universe and elucidate physics beyond the Standard Model. The MoEDAL experiment collects data using nuclear track detectors, which produce images that represent the paths traveled by particles. In order to analyze and categorize these images, machine learning algorithms can be used. In particular, this project focused on training convolutional neural networks (CNNs) to classify images as either "signal" or "background." The performance of these models was compared and improved. As more training data becomes available, the CNN models are expected to become more accurate. These models could eventually eliminate the need for manual analysis of nuclear track detector images.
**Student Presenter:** Ryan Tuckey, Ed Griffin,

**Title:** Characterization of Cellular Mechanisms Underlying Pathology in Alzheimer's Disease using C. elegans.

**Abstract:**

Alzheimer's Disease (AD) is the most common neurodegenerative disease that afflicts ~5.5 million Americans, and ~44 million people worldwide. AD represents one of the greatest societal burdens of our time and innovative strategies to more rapidly advance discovery toward a cure are desperately needed. AD is, in part, caused by the accumulation of a misfolded protein known as Amyloid Beta (Aβ). In order to study how Aβ contributes to this disease, we have established the use of the model organism Caenorhabditis elegans (C. elegans). C. elegans is an anatomically transparent nematode that has had a connectivity map constructed for its entire nervous system, is genetically tractable and amenable, and shares many genes with humans, including genetic factors that are associated with AD pathology. In particular, genes that code for components of the endocytic pathway, a system by which cells internalize material for recycling or degradation, and the formation of exophers, a way cells separate and secrete aggregated materials, are representative natural cellular mechanisms we have shown to be implicated in AD. To study this pathway, we have decided to employ a transgenic strain that constitutively expresses human Aβ in its body-wall muscles, slowly inducing paralysis over time, in addition to a neuronal model whereby Aβ-dependent neurodegeneration can be quantified over the course of the nematode lifespan (only ~20 days). We have made use of a technique called RNA interference (RNAi) that allows us to selectively block the expression of certain genes we hypothesize to play influential roles in the endocytic pathway. We observed that depletion of arl-8 and vps-41, targets involved with intracellular trafficking, or atg-7, a key effector of cellular autophagy, exacerbated the effects of the constitutively expressed Aβ by causing earlier and more distinct paralysis and neurodegeneration. Hampering exopher production by depletion of the exopher-effecting gene, pod-1, exacerbated neurodegeneration and increased extracellular deposition while depletion of the coelomocyte uptake gene, cup-4, also increased neurodegeneration. Using recently discovered amyloid plaque-specific dyes, we have also examined how depletion of these genetic targets influences deposition of insoluble plaques in our paralysis model. By analyzing changes in behavior and neurodegeneration in these conditions, we have observed how deposition may correlate with neuronal behavior and integrity. The combination of these methods should yield new insight into AD pathology and assist in determining what roles these genes play in the accumulation of Aβ.
Student Presenter: Melissa Uehling
Title: One-carbon metabolism gene GCST-1 modulates amyloid-beta toxicity in Alzheimer's disease models

Abstract:

Not Publishable
Session 2: 10:30-12:00 | Life Sciences, Physical Sciences, Mathematics, & Water
Category 1: Work in Progress
Poster Number: 4

Student Presenter: Monica Vermillion
Title: Analyzing Vegetation Change on Andros Island Using Remote Sensing

Abstract:
Based on data collected from interviews with veteran fishing guides on Andros Island, there has been a decline in marine life since the 1960s: bonefish (Albula vulpes) specifically have seen the greatest decline on Andros. Mangroves and shallow water vegetation play a critical role as a habitat for the development of bonefish. If there is a decline in the amount of vegetation on the island that correlates with the bonefish decline, the degradation of the mangroves could be a possible explanation for the bonefish population change. To measure the vegetation changes remote sensing techniques were used to turn image data into useable information. Normalized difference vegetation indices (NDVI's) will be performed on all Landsat TM images examined for the project. Only images with less than 10% cloud cover will be used, which limits the years and frequency of the collected data. An NDVI is an ideal band ratio for showing vegetation and enhancing the contrast between water and land. Andros is unique because to the east there is a very deep channel of water, whereas the west side is all shallow seas. The white sand in the shallow water reflects much brighter values compared to deeper sections, making it harder to distinguish vegetation from sand. In an NDVI water appears much darker and creates greater contrast, allowing for more accurate image interpretation. Unsupervised classifications will be performed on the enhanced Landsat TM images to group pixels based on their spectral properties. Information classes will then be designated based on ground truthing and current vegetation maps, with consistent classification from image to image. Information classes include water, urban, coastal vegetation, and inland vegetation. The number of pixels in each image and class can then be recorded and compared. A percent change in the pixel count from image to image can be calculated using the earlier one as a control. Currently, only some of the images have gone through the classification, but a decline in the vegetation is starting to show. Once the rest of the images have been analyzed, the data will most likely support this trend, suggesting a relationship between the decline of vegetation and bonefish populations.
Student Presenter: Lillian Vogelsong, Abigail Sisti, Allison Diamond
Title: Wrack Line Pollution on Belizean Barrier Islands

Abstract:
Poor waste management techniques in Belize, its neighboring countries of Honduras and Guatemala, and passing cruise ships are the culprit of significant amounts of coastal pollution. No past research has surveyed wrack line pollution in Belize. Pollutants in the top layer of the wrack line were categorized and quantified at 40 sampling sites along the coast of Belizean Cayes during the dry season. The source, composition, and spatial distribution of pollution was investigated. In all sampling sites, small styrofoam and plastic pollutants had the highest occurrence. Interviews with locals were conducted to better understand methods of waste management and cultural perceptions of coastal pollution. Coastal areas with less land development and less human interaction had greater wrack line pollution. While a notable amount of pollution originated from the neighboring countries of Guatemala and Honduras, the vast majority appeared to originate from either Belize itself or untraceable origins; the possibility that some pollution originated from cruise ships should not be ruled out. Coastal pollution in Belize presents numerous economic and ecological issues for the government, tourism industry, and environment. Future research should investigate the ecological consequences of this wrack line pollution.
Abstract:

While the influence of social experiences on animal aggression has been well studied, their effects on learning and memory are not fully understood. Behavioral changes resulting from social competition can last up to one month, suggesting that learning and memory may govern experience-induced changes in behavior. Previous studies in mangrove rivulus fish (Kryptolebias marmoratus) suggest that prior social victories increase proficiency in spatial learning while social defeats decrease proficiency in spatial learning. However, animals in this study were not highly motivated in the learning tasks, which made it difficult to discriminate learning proficiency from learning motivation. Additionally, most studies focus only on individuals that pass the learning tasks instead of comparing changes in performance before and after experience, which limits what we can learn about how experience affects behavioral variation.

We hypothesize that previous fighting experience alters spatial learning proficiency. We predict that winning experiences increase an individual's proficiency in spatial learning task because dominant individuals are more likely to have to defend an acquired territory or to efficiently locate resources. We also predict that losing experiences will decrease an individual's spatial learning proficiency because losers usually behave more submissively and prioritize behaviors that allow them to recover from the experience. To assess spatial learning abilities, we challenged mangrove rivulus fish to recall the location of water in a 5-gallon tank containing only a wet surface; the test includes a visual cue associated with water location and appropriate controls for directional tendencies. In the training phase, fish were given two sessions to become familiar with the environment and to learn the location of water by moving around in the tank. In the testing phase, fish were challenged to navigate the arena to find the location of water. This spatial learning test is built on the ecologically relevant premise that rivulus jump or crawl across wet land to seek out water. 225 mangrove rivulus fish were allocated to one of three experience treatments (winning, losing, and control) and were subjected to a spatial-learning test before and after social experience at 1, 3, and 48 hours. We quantified pass/fail on the learning task, the latency to find water and the angle of the animals' first jump as measures of variation in success. We also (1) examined changes in learning performance before and after social experience; (2) quantified differences in learning behavior between individuals with winning, losing and control experiences; and (3) investigated temporal changes in learning following social experiences.

Data indicate that individuals with winning experiences perform significantly better at spatial learning than those with losing or no experiences. This effect is most pronounced 1 hour following experience. Pilot brain proteomics data reveal that the enzyme "creatine kinase B (CKB)"; which is associated with spatial learning in the hippocampus, is upregulated in winners and downregulated in losers. In the future, manipulating CKB expression may lead to a better understanding of the molecular mechanisms underlying experience-induced changes in behavior, particularly in spatial learning.
Abstract:

Childhood obesity is a growing epidemic in westernized cultures that leads to lifelong adverse effects, even when corrective measures are taken later in life. Metabolic syndrome (MetS) research is centered around understanding the negative effects of obesity, such as increased risk of heart disease, diabetes, and stroke. Some underlying factors of MetS include the sex of the individual, excess calorie consumption, physical inactivity, and genetic factors. Our research aims to model these factors, their interactions, and their subsequent consequences. In particular, we focus on the negative effects that arise from eating a high-fat diet during childhood and the potential to ameliorate these effects with exercise in adulthood. Our previous work using the TreadWheel, a machine that exploits the instinctual negative geotaxis of Drosophila to exercise them, demonstrated that exercise substantially improves adult fly metabolic health in a sex- and genotype specific manner. In this study, we explore further the effects of exercise on adult fly health by comparing the outcomes for ten genetically distinct lines from the Drosophila Genetics Reference Panel (DGRP) fed either a 1.5% high-fat or standard lab diet as larvae. The flies then experience an induced-exercise verses control treatment as adults. The daily exercise regime follows a five-day inverse pyramid protocol of alternating bouts of exercise and rest within a two-hour window. After protocol completion, we perform a negative-geotaxis climbing assays and measure dry weight, triglyceride storage, and survival. We found that climbing performance, adult weight, triglyceride storage, and survival showed interaction effects across sex, diet, exercise, and genotype. In future work, we will explore the impact of exercise on insulin signaling and sensitivity.
Session 2: 10:30-12:00 | Life Sciences, Physical Sciences, Mathematics, & Water
Category 2: Completed Work
Poster Number: 25

Student Presenter: Donna Xia
Title: Actinide Aqueous Hydrolysis Reactions: Initial Steps in Actinide Aggregation

Abstract:
Not Publishable
Abstract:

The project was centered around using evidence based practice to help increase efficiency regarding systematic literature reviews. Specifically, the project centered on using Latent Semantic text analyses to correctly categorize documents as "relevant" or "irrelevant." The project uses R to build a 3D vector space model of labeled documents. The relevance of documents is established by calculating the cosine of the vectors between the closest documents. Ultimate applications of this study include the ability to categorize a wide range of documents based on relevance to a particular topic, with the text analyzed spanning from documents originating from research to social media.
Abstract:

Study Objective: The University of Alabama Bateman Team is creating and implementing a campaign for the national client, With Purpose. With Purpose, is a youth and community-led movement dedicated to making sure children with cancer have access to safe and effective treatment options. Less than four percent of research funding goes to childhood cancer, and the main goal of the campaign is to raise awareness of that alarming statistic. In order to create and implement an effective campaign, the team had to measure the awareness of the disparity between childhood cancer and adult cancer treatment research, and additionally, measure the attitude of The University of Alabama community toward donating to With Purpose and participating in a With Purpose chapter. Finally, post-campaign, the team will measure the action taken by the community through the amount of pledges received, the amount of money donated and the number of chapter members.

Summary Of Previous Literature: As stated before, less than four percent of federal research funding goes to research and treatment research of childhood cancer. It has approximately 50 years since a major advancement in childhood cancer treatment. This is alarming considering that one in five children diagnosed with a form of pediatric cancer will not survive.

Methodology: The UA Bateman Team has planned a two-fold research process to measure the awareness, attitude and action goals of the campaign. The first part was measuring where the awareness of the disparity in funding and the attitude of donating toward and volunteering with UA With Purpose stood. To do this, the team sent out a pre-test survey containing awareness and attitude questions about the general issue of childhood cancer. The pre-test survey received 2,400 respondents. The team also conducted two focus groups with eight UA students to gain more understanding of awareness and attitude levels through a more open dialogue. The second part of this two-fold process will be the post-test survey. This will measure those same awareness and attitude questions, but also measure the action level of the community as well. This two-fold research process will allow the UA Bateman Team to measure the overall awareness of the disparity of funding for childhood cancer treatment, the attitude of the community toward this issue, and the action taken because of the campaign. The surveys and focus group provide benchmarks to measure the overall success of the campaign. Since the campaign ends March 15, the research project would be complete by the time of the conference.
Student Presenter: Brooke Bambis
Title: A scoping literature review: Access to diabetes health services using Geographical Information Systems

Abstract:

Diabetes is the seventh leading cause of death in the United States and prevalence is highest in the Southeastern region. Recent estimates indicate 21 million Americans have been diagnosed with diabetes and an additional 8.1 million live with undiagnosed diabetes. While diabetes self-management education (DSME) is an evidence-based strategy that has been shown to improve diabetes outcomes, evidence-based diabetes education services are not uniformly accessible. Disparities in access to diabetes education services are major public health priorities. Disparities in access to services contribute to existing disparities in diabetes outcomes including mortality. Variation in access to services have been found to be strongly associated with variations by race, social-economic status, and place of residence, and have been linked to health disparities. Studies have shown that geographical access to health services is reduced by increasing travel distance, travel time, travel cost, and effort to travel, and leads to decreased utilization of services. Findings from research demonstrate that the provision of health services often does not match need and that the use of services declines as distance increases.

GIS is a growing technology and research methodology in the study of health service access. Over the last 25 years GIS have demonstrated value in the integration of statistical and geographic data and the visualization of the spatial relationship between location and resources. GIS allows for convergence of disease-specific information and analyses relative to specific areas and populations and the surrounding social and health services as well as the natural environment. They are able to analyzing epidemiological data, revealing trends and interrelationships. GIS can link and join geographical and large attribute databases as well as query these databases to produce patterns of health outcomes. Its ability to link geographical features on a map with attribute data is proving more and more useful in the analysis of health data and planning of health services. GIS research can provide easy visualization of health related problems and has great value in health planning and health policy development and the allocation of health resources.

The purpose of the larger research project is to explore the geographical accessibility of the Southeastern U.S. population to diabetes education services and determine the contribution of distance to county age-adjusted diabetes mortality rates while adjusting for age, sex, race, education, socioeconomic status, and rurality. A GIS will provide visual identification and empirical measurements of distance and access.

This poster will describe a scoping literature review method used to begin the larger research study. It will provide results of a limited and strategic review of the literature providing evidence about how GIS has been used to investigate access and/or distance to health services for diabetes. Literature searches of two electronic databases (CINAHL, PubMed) have been completed using the following search terms: "geographic information systems" AND "diabetes". Abstracts were then scanned for terms "access" or "distance". The Methodology for Joanna Briggs Scoping Reviews was utilized. Results: The scoping review is in progress and the poster will provide a partial review of the literature.
Abstract:
Previous findings support grocery store tours as a point of purchase intervention to increase participants' knowledge and intentions to purchase targeted products.

However, there is a lack of research utilizing systematic analysis of data and implementing appropriate research design. However, there is a lack of research examining the effectiveness of grocery store tours by utilizing systemic analysis. In order to examine the effectiveness of grocery store tours as a nutrition education tool to increase consumers' intentions to purchase fruits and vegetables, a cross-sectional study was conducted in 2017. A total of 147 grocery shoppers, 18 years or older, who participated in grocery store tours completed a retrospective pre- and post-tour survey measuring the participants' background information and their intention to purchase fruits and vegetables. Descriptive statistics and independent samples t-tests were used to analyze the data. Mean values of participants' intentions to purchase fruits and vegetables in each category- fresh, dry, canned, juice, and frozen- increased significantly after the tour (p<0.05). Findings suggest that grocery store tours serve as an effective tool to increase shoppers' intentions to purchase fruits and vegetables.
Abstract:

Background/Problem: Healthier students are better learners. Research demonstrates that health-related problems interfere with ambition and the ability to learn. Healthy behaviors initiated during childhood are more impactful than altering or changing unhealthy behaviors as an adult. Schools are an excellent place to teach and allow students to apply the healthy behaviors presented.

Purpose: The mission of The Capitol School, a private school for pre-school through 12th grade, located in Tuscaloosa, Alabama is to educate responsible citizens of the world by incorporating the newest and most effective means of teaching. The purpose of this activity is collaboration between The Capitol School and community public health promotion to achieve improved learning and health.

Methods: The internet and social media platforms are relevant topics that the majority of students experience daily. Therefore, one activity is a panel discussion at the school for parents and students about internet and social media etiquette including cyberbullying. The panel includes faculty from The Capitol School and Public Health students from The University of Alabama. There is also a guide for parents to take home and discuss with their child. There will be age appropriate activities to promote healthy eating, simplicity of eliminating germs and more specifically the flu by washing hands and proper levels of physical activity.

Results: Education is routinely regarded as a significant social determinant of health and healthier students are better learners. Therefore, efforts to improve student health through collaborative health promotion in school will result in greater academic achievement. Students spend a majority of their day at school which provides the opportunity to increase student knowledge and practice healthy behaviors. The public health community and educators will form partnerships to improve both student health and academics and learn to work collaboratively.
Student Presenter: Jessica Bentley

Title: The Effect of Celiac Disease on Bone Health in Children and Adolescents: a Systematic Review and Meta-analysis

Abstract:

Study Objective: The primary aim of this study is to examine the potential differences in bone density when comparing individuals with Celiac Disease (CD) to healthy children and adolescents.

Summary of Previous Literature: CD is an autoimmune disease in which the villi in the small intestine are unable to absorb the protein gluten. This leads to damage to the villi and malabsorption of nutrients. Malabsorption is a common cause of nutritional deficiencies in patients with CD, including deficiencies in iron, vitamin D, and calcium. The body's inability to successfully absorb these vitamins can lead to anemia and osteoporosis. Even at a young age, those with CD are at risk of low bone density.

Proposed Method: This systematic review and meta-analysis has been registered with PROSPERO (International Prospective Register of Systematic Reviews, ID: CRD42018088330). The review will be conducted in accordance with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) statement guidelines. Articles published before February 27th, 2018 were located using searches of the PubMed (n=180), Physical Education Index (n=186), Scopus (n=3), SPORTDiscus (n=3), and Web of Science (n=4) online databases using combinations of the terms: Celiac Disease, Coeliac Disease, Gluten Enteropathy, Non-tropical Sprue, Bone Mineral Density, Bone Mineral Content, BMD, BMC, Child*, Adolescent*, Youth. Of the 376 potentially relevant reports identified, 11 duplicate publications were removed. Non-duplicate articles will be independently screened by title and abstract, and then followed by a full text-reports evaluation to determine eligibility. Reference lists of included studies, relevant reviews and meta-analyses will also be manually searched for additional reports not discovered using the electronic database search. Studies included in this meta-analysis will be limited to 1) peer-reviewed publications, 2) available in English, 3) involving human participants younger than 20 years old, 4) with samples of participants with diagnosed CD and healthy control participants, 5) reporting a measure of bone health as mean ± standard deviation. Studies that will be eligible for inclusion within the review will be cross-sectional studies, as well as baseline data from prospective cohort studies, randomized and nonrandomized control studies. Hedges' d effect sizes (ES) will be calculated by subtracting the average in the CD group from the average in the healthy control group and dividing the difference by the pooled standard deviation (SD), and adjusted for small sample bias. Following the observation of significant differences in bone health, variables such as diet, physical activity, body mass, and sunlight exposure will be evaluated using post-hoc analysis to determine how they may affect bone health. Random effects models will be used to aggregate a mean ES and 95% confidence interval using SPSS 23.0 (IBM Corp., Armonk, NY, USA).
Abstract:

In examinations of human online interactions, it has been discovered that users typically behave according to the concept of "positive herding," being more likely to agree with the message of content if it has been well-received by others. As a result, many individuals are more likely to interact with posts in contrast to their actual beliefs. Since researchers have indicated that human development is highly dependent upon the environment an individual interacts with on a common basis, this study examined the algorithm responsible for curating the content with which users interact. The purpose of this study was to determine whether curation algorithms on content curation sites such as Reddit behave identically regardless of the content of a post. The top 2.5 million Reddit posts were analyzed with a Long Short-Term Memory (LSTM) neural network developed using TensorFlow. This model was then used to develop a neural network to predict in real-time which posts would be curated based on their thematic elements. The curation algorithm was found to be dependent upon post content, indicating that certain topics are more likely to reach the front page of the site. An increasing trend was observed in the number of niche topics likely to be curated over time. Additionally, the Reddit algorithm has become increasingly likely to promote content of consequence to site users, such as world news and Reddit-related changes. This study implies that the curation algorithm does not offer users a randomized representation of new topics, but rather contributes to a collective sentience among users. Since this project was limited to textual content, further investigation is needed to analyze non-textual content in regard to thematic curation.
Abstract:

Transparency has become one of the leading topics discussed within the fashion industry. As more consumers want to know where and under what conditions their clothing is made and how much it really costs to make it, many fashion companies have adopted transparency strategy into their business models. For example, Everlane (www.everlane.com), is a San Francisco-based online retailer that reveals the variable costs of production for each of its products, as well as images and descriptions of the factories where products are made. Research shows that when the firm communicates the effort that goes into making a good, consumers tend to value the product more and become more attracted to the company or brand. Elizabeth Suzann is a design and manufacturing company producing a line of elegant, utilitarian, women’s clothing from its hybrid production facility and design studio in Nashville, Tennessee. Its founder Liz Pape, began the company by seeing a need for high quality, basics and functional pieces. Elizabeth Suzann stands apart from other fashion brands by making everything in its Nashville studio and being transparent about its pricing strategy. The cost of a piece of clothing is the result of the entire process that brought that product into existence, including the expenses from fabric, constructing the garment, and the business model of the company. This case study seeks to describe Elizabeth Suzann's unique business model and its transparency practices throughout the supply chain.
Abstract:

Often, critiques against the federal government's efficacy are constructed in a vacuum. In other words, in dialogue about the effectiveness of government policy participants do not consider the relative difficulty of response based on historical trends and current data. A lack of historical perspective is especially prevalent in Economics. In order to highlight the context needed for historical evaluation, a comparative analysis was conducted of the '81 and '08 recessions using graphical analysis of 6 different economic metrics. The overarching analytical objective was to look at data 9 months before and after the recessions and ascertain which recession had the worse initial conditions and which recession experienced the slower recovery. We considered the Federal Reserve the "actor" in charge of recovery, and hypothesized that the Fed was in a worse position in '08 and also executed a slower recovery. In addition, all the data that the Federal Reserve has collected on recessions since the 1940's was collected, to identify all 12 instances of recession during the time frame. Consequently, we were able to rank all the recessions based on the time it took for each 6 metrics to recover to their pre-recession levels. Overall, we confirmed than the economy was in a worse position in 2008 and had a slower recovery. Further, the '08 recession experienced the slowest recovery out of any recession in the data time frame by a wide margin.
Student Presenter: Brooke Boyles, Bailee Gist, Molly Jackson, Sophie Norgaard, Grace Shirah
Title: RELIABILITY AND VALIDITY OF THE IDDSI FLOW TEST AS A MEASURE OF LIQUID CONSISTENCY

Abstract:

Not Publishable
Student Presenter: Anna Bragg  
Title: Bioavailability and Acute Effects of Bioactive Compounds in Watermelon Juice on Blood Pressure

Abstract:

Background: Previous studies have shown that watermelon extracts can improve blood pressure after six weeks of supplementation as a result of the effects of arginine and citrulline on blood vessel dilation. Despite the potential for improvements in blood pressure, the acute effects of ingesting watermelon juice instead of extracts have not been studied.

Objective: To assess the effects of a one-time dose of 100% watermelon juice on blood pressure and the bioavailability of bioactive compounds potentially mediating these effects in a population of older adult women.

Methods: A group of 8 women consumed a 12-ounce serving of 100% watermelon juice after an 8-hour overnight fast. Blood was collected and blood pressure was recorded at baseline and two hours after consumption of the juice. Pulse pressure, a measure arterial stiffness, was calculated using the mean systolic and mean diastolic blood pressure. Serum levels of lycopene, arginine, and citrulline were assessed using an ultra-high performance liquid chromatography system coupled with a mass spectrometer.

Results: After ingesting one 12-ounce dose of 100% watermelon juice, average systolic and pulse pressure decreased, yet measurements did not reach statistical significance. Ingestion of 100% watermelon juice resulted in significant increases in serum lycopene levels (p<0.001); however, circulating levels of amino acids did not increase significantly post-consumption of 100% watermelon juice.

Conclusions: Despite non-significant decreases in blood pressure, this pilot study justifies the need for further research into the influence of this food-first intervention on reducing blood pressure in order to establish a dose-duration effect.
Student Presenter: Sarah Burnash  
Title: Cardiovascular Drift: Menstrual Phase Fluctuations

Abstract:
Not Publishable
Abstract:

Introduction: Dietary patterns are established early in life and tend to persist into adulthood. Dietary patterns can be influenced by one's knowledge of nutrition. Improving these dietary patterns earlier in the lifespan can help in reducing one's risk of chronic disease. This relationship between intake and knowledge can help guide future interventions among college students.

Purpose: To assess fruit, vegetable, and fiber intake as well as nutrition knowledge among college students.

Methods: A cross-sectional study was conducted with 344 college students (ages 18.95 ± 1.31 y; 13.1% male) enrolled in a Human Development 101 course with the majority of students (89.2%) having no prior college-level nutrition course. Participants completed a modified Nutrition Knowledge Questionnaire along with Block food screeners (NutritionQuest, Berkley, CA) to estimate intake of fruit, vegetables, and dietary fiber.

Results: The relationship between risk of cancer and risk of heart disease and one's intake fruit, vegetable, and fiber was correctly identified by about two thirds of the students (64% and 61.6%, respectively). Despite this knowledge, participant's fruit/vegetable and fiber intake was significantly lower (3.2 ± 1.9 servings and 15.6 ± 5.8g, respectively) than that recommended by the 2015-2020 Dietary Guidelines for Americans. Students lacked knowledge to identify the fiber content of various foods with 40% of the foods being incorrectly identified.

Conclusion: Despite recognition of the health benefits associated with fruits, vegetables, and fiber, the student's inadequate intake of these nutrients may have been a result of their inability to identify nutrient-dense food sources. In order to improve the dietary intake of young adults, and therefore lessen their risk for chronic disease, an intervention to address these gaps in knowledge is necessary.
Abstract:

An online Geographic Information System (GIS) web application that connects producers and consumers of recyclable material was developed to assist engineers and contractors in the beneficial reuse of recycled materials in transportation projects. The Recycled Material Web Map is comprised of four core layers: producers, stockpiles, specifications, and case studies. Producers of recycled material can locate their facility and enter contact information. The stockpile layer, connected to the producer layer, allows facility managers to add or update information about their recycled material stockpiles including material type(s), application(s), availability, and cost. Multiple stockpiles can be associated with each producer. The specification layer includes both Department of Transportation (DOT) specifications and environmental regulations pertaining to the beneficial reuse of nonhazardous recycled material based on specific location, material type, and application. The case study layer locates projects that successfully utilized recycled materials and includes information regarding the material type, application, volume data, and any additional documentation.

As potential consumers of recycled material, engineers and contractors can pinpoint the location of a construction project, search for sources and quantities of recycled material that meet project specifications, and contact material producers. The web map utilizes search capabilities to locate nearby stockpiles to minimize transportation costs that typically dictate the use of large volumes of materials. The Recycled Material Web Map provides key information that engineers and contractors need to successfully utilize recycled materials, thereby preserving limited natural resources and benefiting the project and society as a whole. The web map is available at http://rmwm.caps.ua.edu.
Student Presenter: Sarah Cole  
Title: Utilization of Technology for Assistance in Treating Depression: Evaluation of Mobile Applications

Abstract:

Background: Depression is the most common mental health disorder; is the leading cause of ill health and disability worldwide; and causes immense morbidity, suffering and escalating rates of suicide. Prevention and treatment efforts are immensely inadequate. National health objectives outline the strong need to increase the proportion of adults with mental health disorders who receive treatment. Numerous barriers interfere with people receiving treatment including (but not limited to) lack of number of and quality of mental health services; lack of access to facilities that provide mental health services; lack of accurate information regarding mental health; and perceived negative stigma regarding depression and other mental health conditions. Overcoming these barriers is crucial and challenging. The use of technology has been suggested to assist with the provision of mental health services and to overcome specific barriers. One proposed method is the use of technology in the form of mobile applications. Mobile applications have been used with success for other health issues and therefore warrant examination for assistance with depression. Most adults spend an average of 2 hours, 7 minutes a day on mobile apps. Utilizing mobile apps may help to avoid mental health stigma to receive help, treatment, or to access information.

Purpose: The purpose of this study is to evaluate current mobile apps available through the Apple App Store targeting depression for usefulness, readability, usability, and integration dimensions (Chan et al., 2015).

Methods: The search term "depression" in the Apple App Store will be used to identify the top depression focused apps for the iPhone/iPad. Apps not in English and those that do not target adults 17+ years of age will be excluded. The top depression focused apps according to user rating (1 to 5 stars) and cost (paid versus free apps) will be downloaded from the Apple App Store and evaluated using the three dimensions of evaluation criteria for mental health apps. Additionally, apps will be evaluated for readability and quality of depression information.

Discussion: This study will attempt to assist in overcoming numerous barriers that interfere with people receiving mental health services. The use of technology requires no travel and people can maintain a level of privacy when utilizing technology. The results of the evaluation of depression mobile apps will help provide insight on how to improve these applications in order to deliver accurate, engaging and effective education and treatment. Recommendations to improve applications will be provided regarding cultural and linguistic appropriateness.
Abstract:

Study Objective: This grant-funded project intends to implement emergent telemedical capabilities into the two ambulances operating in Pickens County, Alabama—a historically resource-poor and underserved community. Telemedicine has been defined as the use of modern telecommunications and information technologies for the provision of clinical care to individuals at a distance, and transmission of information to provide that care (Güller & Übeyli 2002). With few healthcare facilities, a population of nearly 20,000 residents, and being ranked as the seventh poorest county in Alabama, Pickens County faces a myriad of healthcare challenges. The proposed innovative use of telemedical equipment in ambulances will foster a communication-rich environment between distant healthcare providers and emergency medical technicians (EMT's) to facilitate more immediate medical evaluations. The project will adopt a hub-and-spoke model of telemedicine—connecting a central hospital, the Pickens County Medical Center Emergency Department, to distant ambulances to facilitate improved care. Through this unique approach to address healthcare disparities, we anticipate improvements in cost of care for the healthcare providers and patients, increased quality of care, and increased efficiency of care.

Summary of Previous Literature: Previous research has demonstrated the applicability, utility, and benefits of telemedical implementation in various setting. After integrating telemedical capabilities into ambulances serving the urban city of Houston, Texas, Langabeer et. al (2016) analyzed the comparative effectiveness of the program to previous years of traditional ambulance use. The study observed a 56% absolute reduction in ambulance visits to the emergency department and concluded EMS productivity had increased by measuring a decrease in "back in service time"—time between being dispatched and when the ambulance became available to a subsequent incident. These results reflect not only improved quality and efficiency of care, but also decreased cost of care.

Proposed Method: The proposed research will investigate five intended consequences of incorporating telemedical capabilities into rural ambulances: increased patient satisfaction of care, decreased overall cost to hospital and patient, increased quality of care, increased efficiency of care. Surveys and interviews will be administered to patients via telephone to quantify their satisfaction of care. Focus groups will also be implemented into the study design to gauge the opinions of the healthcare providers. Data reflecting the time for an ambulance's arrival, visits to emergency departments, and costs accrued by the patient and healthcare facility will be analyzed and compared to previous years to reflect any changes to efficiency and cost of care.
Abstract:

In recent years, there has been increased concern about the spread of distress from one financial system to others. For example, runs across multiple financial institutions in numerous European countries occurred in the global financial crisis and the European sovereign debt crisis. By comparison to the case of Europe, the objective of this research is to examine the possibility of financial contagion between the United States and Canada. Though our previous work focused solely on how different economic conditions and the composition of balance sheets within the Canadian banking system impact banking fragility in Canada, we now seek to understand if there is any evidence of contagion between the two countries. That is, in addition to activity among Canadian banks, we extend our previous work to incorporate additional information on the impact of banking activity and macroeconomic conditions in the United States. We are also interested in whether activity in the Canadian banking system affects the degree of fragility in the U.S. While U.S. banking failure, balance sheet, and macroeconomic data are easily obtained from the Federal Deposit Insurance Corporation (FDIC) and the Federal Reserve System, it is somewhat difficult to obtain the same information about Canada's banking system. This is because the Canada Deposit Insurance Corporation (CDIC) does not make data on the size and specific dates of failures publicly available as the FDIC does. However, through careful review of the annual reports of the CDIC and consultation with CDIC staff, we produce a unique dataset detailing the magnitude and timing of failures in Canada since the inception of the CDIC. We supplement this data with information on the composition of assets held across the Canadian commercial banking system as well as general Canadian macroeconomic data. Thus, by using detailed information on both countries' banking systems, our study provides the first available evidence on the mechanisms behind financial contagion between the United States and Canada.
Abstract:

When thinking of the United States and Cuba, many conflicting opinions are easily presented with regard to their relations. Cuba has dealt with not only a multitude of political unrest and disparities, but also many human rights violations. Cubans have historically endured countless obstacles and pressures attuned to concentration camps and slavery. Likewise, the United States of America's embargo against Cuba has limited the country economically and weakened abilities for educational attainment due to Cuba's severe lack of resources. Many Cubans have lived almost solely off of governmental propaganda and have become very resourceful as a result.

Yet, one feature that is arguably universally Cuban-known is their access to healthcare. Western medicine was established in Cuba in the 19th century and has since developed to include a number of primary care facilities. Doctors and nurses are taught through internships and mentorships as opposed to separate medical universities, as is the model in the United States, and its health system is set up in a series of tiers based off of medical needs. The Castro regime heightened medical attentiveness and attempted to strengthen its access to reach rural communities. Healthcare is completely free, and the biggest aim of the Cuban healthcare system is prevention.

Amongst these preventative efforts exist vaccines. While Cuba administers most of the same vaccines commonly found in the U.S., they do not have the same stigmas surrounding vaccines as can be found and heard in the states. They have also developed vaccinations that are well beyond what is available or developed in the U.S. and seem to have relatively easy modes of administration. Furthermore, another huge aspect of Cuba's system of preventative health is maternal health. With a focus on diminishing both infant and maternal mortality rights, Cuba has devoted extensive efforts towards ensuring safe pregnancies for both mothers and children.

Through this research I seek to delve into Cuba's system of preventative healthcare focusing on vaccines and maternal healthcare rights. Through cross-comparisons to medical systems in place in the United States, I hope to highlight some key differences and some key similarities. As U.S.-Cuban relations continue to expand and progress forwards, it is important to recognize efforts that can be used to enhance the quality of medical care for both Cuban and American citizens.
Student Presenter: Jakub Denkiewicz
Title: Voxel Based Morphometry Study on Mild Cognitive Impairment

Abstract:

Objective: Understanding changes in structural brain features associated with cognitive performance during aging is crucial for development of diagnostic tools for conditions like dementia and Alzheimer's. The objective of this study is to investigate brain atrophy in participants with mild cognitive impairment (MCI) and to examine how well behavioral measures for MCI predict structural brain features associated with dementia.

There are only two studies using voxel based morphometry (VBM allows investigation of focal differences in brain anatomy) on MCI, and with the availability of publicly available MRI data, more comprehensive studies can be conducted. We utilized the Open Access Series of Imaging Studies (OASIS), a data set made available by the Washington University Alzheimer's Disease Research Center, Dr. Randy Buckner at the Howard Hughes Medical Institute (HHMI) at Harvard University, the Neuroinformatics Research Group (NRG) at Washington University School of Medicine, and the Biomedical Informatics Research Network (BIRN).

The specific dataset used in this study is cross-sectional MRI data from young, middle aged, and nondemented and demented older adults. Sixteen controls and sixteen participants with MCI were paired by both age and gender. We studied brain atrophy with VBM in the elderly population, aged 60-90. Subjects were all right-handed and include both men and women. Subjects have no significant difference in social economic status or education.
Abstract:

World hunger and starvation are very prominent problems in today’s society. People in America think is world hunger as something that only happens in developing countries, but that is nowhere near true. 1 in 7 people in America struggle with hunger and 1 in 5 Alabamians struggle with hunger. At the West Alabama Food Bank (WAFB), in Northport, AL, a non-profit organization whose purpose is to help their neighbors acquire the nourishment they need to live life at its fullest. The mission of West Alabama Food Bank is to help alleviate hunger and food insecurity in nine West Alabama counties. WAFB serves a population of more than 315,000 residents, to over 15 percent of whom are living in poverty. Alabama has one of the highest poverty rates in the country. The WAFB collects surplus and salvageable food and distribute it to agencies serving the needy. Volunteers provide their services like funding development, sorting food, packing backpack meals and Senior Boxes. While volunteering at the WAFB, I have packed backpack meals that are put into the backpacks of elementary school children that are struggling with hunger. Since many children in Alabama rely on free and reduced breakfasts and lunches that are provided by the school during the week, so these backpack meals cover the nutrition gaps during the weekend. I have also packed Senior boxes, that are sent to the individuals over the age of 60. This program provides groceries during the middle to the end of the month, at the time where most budgets are drained. The way the people at WAFB measure success, is based on the amount of people they feed. The WAFB has distributed over seventeen million pounds of food to the Alabamians that are struggling with hunger. I have help contribute to their success by helping them packing meals for children and seniors in need.
Student Presenter: Blayde Dill
Title: CodePlayground: A Block-Based Language Designed for the Adafruit Circuit Playground

Abstract:

An increase in K-12 computer science awareness has led to the need for engaging environments that introduce early learners to concepts of programming. However, the engaging resources to teach computer science incorporating hardware components to children and first-learners, are limited. To address this issue, a block-based language was developed using Google's Blockly Developer Tools. The Blockly library injects an editor into an HTML file that represents coding concepts as interlocking blocks, and then outputs the blocks as syntactically correct code. This block-based language, appropriately, named CodePlayground, was designed to be compatible with the Adafruit Circuit Playground. The Circuit Playground was released as an all-in-one low cost device that can be used for CS education. CodePlayground allows teachers to utilize the Circuit Playground as an educational device that includes both hardware and software elements. The Circuit Playground uses the firmata provided by Adafruit to communicate with the Python code generated by CodePlayground. Blockly Developer Tools was used to create the frame for the language and Atom was used to insert the specialized JavaScript for code generation. After the language was complete, 90 sample programs were created then given a score on a scale of 0 to 2 based on difficulty and their ability to generate and run code, with 2 being the most difficult and most successful, respectively. All of the programs successfully generated code and 94% of the programs ran. Of the 6% that did not, the errors were due to unchecked boundaries within the block program made by programmer errors.
Abstract:

Background: Recent studies have brought attention to the prevalence of food insecurity among college students. A systematic review revealed food insecurity among as many as 1 in 3 students within post-secondary institutions in the United States. No previous studies have examined whether food security differs between students who participate in Greek life and those who do not. Understanding the differences between these groups of students may prove valuable in combating food insecurity among college students.

Objective: To assess differences in food security and consequent dietary intake between undergraduate student members and nonmembers of the Greek system at a large public university.

Methods: The USDA Household Food Security Survey Six-Item Short Form was administered.

Block food frequency screeners (NutritionQuest, Berkley, CA 2017) were used to estimate dietary intake. These questionnaires were administered to students enrolled in a Human Development 101 course due to the diverse demographics represented.

Results: Three hundred and forty-four students responded to the questionnaire administered. Of these students, 86.42% were female, and 50.87% of the students were involved in Greek life. Intake of fiber, servings of fruits and vegetables, percent kilocalories from fat, and percent kilocalories from saturated fat did not differ by Greek status. All students fell short of recommended intakes for fiber, as well as fruits and vegetables. Over the past 12 months, more than 62% of students reported that they often or sometimes ran out of food and did not have the financial capacity to purchase more. Additionally, 34.3% of students reported skipping meals altogether within the past 12 months due to financial constraints.

Conclusions: Over half of students surveyed stated that financial constraints inhibited healthy eating, and this was reflected in their reported dietary intake. These results were similar regardless of whether or not students were members in Greek life. The data from this study may guide future interventions to address food insecurity among college students.
Student Presenter: Lauren Donaldson, Justin Myers, Daniel McCool
Title: Developing Awareness of Services Offered by Pickens County Medical Center

Abstract:

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Abstract:

Introduction: The older adult population is increasing at an exceptional rate worldwide. Approximately 75% of this population has at minimum one age-related chronic illness, and about 50% presents with more than one. Research indicates that medical nutrition therapy (MNT) improves health outcomes and overall quality of life for older adults. Thus, the expanding aging population offers widespread opportunities and challenges for Registered Dietitians (RDs) in the areas of geriatrics and gerontology. However, previous studies show that nutrition students generally have a lower level of knowledge of the older adult population than of other age groups, and most nutrition students are uninterested in working with this population. There is very little research available regarding students’ perceptions and attitudes toward older adults. As the older adult population continues to grow and the need for geriatric and gerontological specialists continues to increase, gaining an in-depth understanding of nutrition students’ perceptions and attitudes towards older adults will be invaluable.

Objective: Understanding barriers and facilitators among nutrition students when working with older adults will provide guidance to educators, helping them to promote positive attitudes regarding older adults among nutrition students and increasing their desire to work with this population in their future careers. Therefore, the objective of this study was to conduct qualitative research to identify barriers and facilitators among nutrition students when working with older adults.

Methods: A purposive sampling method was used to recruit students majoring in Human Nutrition at The University of Alabama. Individual, face-to-face interviews were conducted from April 2017 to May 2017 in a private conference room at the university. Interviews were audio recorded and transcribed verbatim for analysis. Participants’ background information was analyzed using descriptive statistics and for the qualitative analysis of interview data, a directed content analysis was utilized.

Results: Barriers commonly identified by students included communication difficulties due to age-related changes, stubbornness of older adults, emotional connection to the population, lack of experience and knowledge, fear of perceived disrespect, a generational gap, and the storytelling nature of older adults. Students described previous experience, communication skills, personality traits, passion, knowledge about older adults, and patience as facilitators when working with the older adult population.

Conclusions: Knowledge gained through this study is helping educators better prepare nutrition students to work with older adults and promote positive attitudes regarding the aging population. Findings from this study imply that educators should focus on teaching effective communication skills to nutrition students and providing adequate knowledge about the aging process. Educators should also encourage and facilitate experiences with older adults when possible.
Abstract:

Responsibility based physical education seeks to help students develop a sense of social responsibility and civic engagement. This project looks at ways to help pre-service teachers learn these teaching methodologies and raise awareness of some of the issues to keep in mind when using a values-based approach to teaching. Specifically, the university students work with children from communities affected by poverty in an afterschool program two times a week to gain exposure to people of diverse backgrounds and the needs of the community. We are using surveys of the pre-service teachers to examine their level of community engagement and their views on several subjects, and looking to see if their community involvement has increased and look for changes in views on the needs of the children in their curriculum. The survey looks at areas such as community engagement and ethical leadership. The results of the first year are promising, and we hope to find an increase in awareness of the needs of the communities the children originate from.
Abstract:

An estimated 24.9 million victims are trapped in modern day slavery, commonly known today as human trafficking. A majority of people think human trafficking only involves sex work, but there are so many different forms that go unknown, including labor and financial trafficking. While people mostly think about this as only affecting women, men and children are also affected by this crime every single day. Signs of human trafficking are all around us, and people like service workers and health care providers are especially important in the detection of human trafficking, because they are entering people's homes and are introduced into intimate spaces that the rest of the public may not see. Nurses play a huge role in identifying these victims. They work in all hospital departments and people who are currently being trafficked enter into these facilities daily. Because nurses have the access to the right services to provide immediate help to survivors of this crime, it is important to educate them for signs of human trafficking and suspicious behavior. These professionals are the eyes and ears of the community and have the potential to make a big difference. When you know what to look for, it can help stop this horrific crime and get the survivors the help that they need. The aim of this presentation is to define all three of the different types of human trafficking which are, sex, labor, and financial. We will seek ways to educate the public on how to identify victims and also provide knowledge about who is most at risk to become trafficked. People in our everyday lives could be victims of these horrible crimes. With some proper education, we all have the power to help those who are currently being abused and prevent it from happening in the future.
Student Presenter: Riley Doyle
Title: How to Become a Rich and Famous Researcher

Abstract:
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Abstract:

It is estimated that only 20% of all human trafficking victims will ever reach survivor status (UNODC, 2018). Nearly 80% of human trafficking is for sexual purposes and 19% is for labor exploitation (Lehnardt, 2016). Sex trafficking also plays a large role in the spread of HIV (Lehnardt, 2016). Of particular concern is that human trafficking can easily go unnoticed, yet it is estimated by The International Labor Organization that there are 20.9 million victims of human trafficking around the world (Polaris Project: The Facts, 2017). Nurses need the right resources and information to help such victims by providing them necessary care and understanding how to crack down on these cases. The purposes of this poster are to describe the available resources for health care professionals and human trafficking survivors alike, to distinguish the role of the nurse in caring for those who have been trafficked, and to discuss how human trafficking affects the survivors holistically. The authors to share vital information and to supply nurses with the knowledge and understanding that will hopefully end this vicious cycle.
Student Presenter: Johnny Dwight
Title: Preventing Sleep Deprivation Among College Athletes

Abstract:

Background: When college athletes do not get enough sleep it can affect them negatively. College athletes on average should get up to 8-9 hours of sleep. Anything under the required amount of sleep can lead to sleep deprivation and could affect the athlete physically, mentally and the way they perform academically and athletically.

Purpose: The purpose of this project is to develop a program that focuses on distributing a brochure to college athletes regarding the importance of sleep and ways to overcome sleep deprivation.

Methods: The program consists of presenting information to athletes regarding the many detrimental effects of sleep deprivation. Also the intervention addresses issues that college athletes things to worry about when it comes to not getting enough sleep. Most are worried or either stressing about academics, social issues, the demands of their schedules that include academics and stringent practice schedules. They are concerned about injury prevention. Additionally, they have immense pressures of trying to perform at a high level.

Results: This program will be administered to college athletes in a focus group setting.
Abstract:

Approximately 37.5 million adults over the age of eighteen in the United States have a hearing loss in one or both ears. Previous research regarding the physical health and emotional well-being of this afflicted population has established an association between these aspects of health and hearing loss. Both physical health and emotional well-being are taken into consideration when determining overall quality of life. There is a possibility that the overall quality of life of an adult with hearing loss may be negatively impacted if they have poor access to hearing healthcare. Therefore, access to hearing health care may be a prime factor in how an individual copes with a hearing loss. The purpose of this study was to examine the quality of life in adults with and without hearing loss who live in rural and urban areas. In approximately 58% of the cases, accessibility to hearing healthcare was also evaluated. The demographic of the study included 66 adults (44 females and 22 males) with a mean age of 60 years and diverse ethnic backgrounds. This cohort was geographically located in West Central and South Alabama. Each individual in the study was administered a hearing test in the Hear Here Alabama truck and completed a quality of life questionnaire, the Quality of Life Inventory. Exactly 38 of these adults (27 females and 12 males) with a mean age of 59 years, also completed an accessibility to healthcare questionnaire. The findings from the Quality of Life Inventory, administered to all participants, were not significantly associated with hearing loss for adults living in either rural regions or urban clusters. However, an inverse relationship between quality of life and hearing loss for individuals without access to hearing healthcare was discovered. To better understand the hardships experienced by individuals with hearing loss, research should focus on access to hearing healthcare. A study with an emphasis in this area may provide more insight than using geographical residency as a base. It is recommended that more data be collected to confirm these preliminary findings.
Abstract:

Background: Adolescents is a pertinent time period of growth for children. During this time period, it is vital that adolescents are getting enough sleep and eating a nutritious diet. While progress has been made to engage adolescents in healthy behavior and rates of adolescent obesity have declined in the United States, the State of Alabama is experiencing an epidemic of obesity and a decline in average sleep time. The purpose of this study was to examine the relationship between dietary behaviors and sleep among a nationally representative sample of students in the United States.

Methods: Data for the State of Alabama was extracted from the 2015 Youth Risk Behavioral Surveillance System and compared to the national data set. To determine dietary behaviors, students were asked about fruit, fruit juice, vegetable, dairy, and breakfast consumption over the previous seven days. Additionally, students were asked to self-report the average number of hours of sleep they were getting. Risk factors for unhealthy dietary behaviors and sleep were correlated to determine a relationship between these variables.

Results: Statistical analysis using SPSS will be conducted including descriptive statistics and correlations.

Conclusions: Assessing dietary behaviors and sleep in adolescents is important to help target needed interventions and help improve student academic success.
Abstract:

Objective: Sixty million people living in the United States speak a language other than English, and more than 25 million Americans speak English "less than very well." Research indicates that the use of professional interpreters increases patient satisfaction and improves patient outcomes. Providers are uniquely positioned to impact patient outcomes by utilizing interpreters, when available, and advocating for the increased availability of interpreters (i.e., hiring of qualified medical interpreters) in clinical practice. The objective of this report is to examine provider perceptions of the use of medical interpreters and discuss implications.

Summary of Previous Literature: Under Title VI of the Civil Rights Act, interpreter services are required for all patients with limited English proficiency who are receiving federal financial assistance. Failure to provide these services when necessary is considered discriminatory and illegal, however, in most states, these services are underfunded. Therefore, many patients and providers turn to the use of ad hoc interpreters (including family members) despite the fact that both the Civil Rights Act and the World Health Organization stipulate the use of ad hoc interpreters is unethical. Ad hoc interpreters are far more likely to make significant errors including violating confidentiality and increasing the risk of poor or negative outcomes. In contrast, professional interpreters have been shown to increase patient satisfaction, improve adherence and outcomes, and reduce adverse events. Research indicates that some of the factors associated with a successful interpreter-facilitated communication between patients and providers are: the ability to understand, communicate and negotiate their and others' communicative strategies/goals and the ability to be adaptive of and responsive to others' management of the communicative process. In addition, some specifically provider-dependent factors that are associated with successful interactions include: meeting with the interpreter before the interview in order to discuss background and goals, speaking directly to the patient instead of the interpreter, and seating the interpreter next to or slightly behind the patient.

Method: This study will include a qualitative analysis of semi-structured interviews conducted between October of 2017 and February of 2018 with eight healthcare providers working with Latino/a patients in Western Alabama in which the providers discussed their experiences working with medical interpreters and Spanish-speaking patients. The interviews will be content analyzed by two coders to elucidate major themes. This presentation will include a discussion of these themes and implications for practice.
Abstract:

Childhood obesity is a significant public health concern. Children who are overweight or obese have substantially higher odds of remaining overweight or obese into adulthood. Rates of obesity in adults are significantly higher in minority and low-income residents of Alabama. However, limited studies are available on state-specific trends in obesity prevalence among young children, so rates of obesity in minority, low-income preschool children are not available. This is troubling because obesity is associated with health conditions such as cardiovascular disease and type 2 diabetes, two of the leading causes of death in the United States and Alabama. Increased body mass index (BMI) and unhealthy behaviors in childhood are associated with obesity and related chronic diseases in adulthood (e.g., high blood pressure, high cholesterol, diabetes, heart attack and stroke). Research consistently shows a relationship between obesity and a less favorable blood lipid profile among children. The process of atherosclerosis begins very early in life; therefore, reducing cholesterol levels in children at young of an age as possible would maximize the chance of preventing coronary heart disease. However, few studies have examined determinants of blood lipid levels of preschool children. Studies addressing the multiple factors that put preschool children at risk for obesity and its associated negative health outcomes are also limited. Research suggests that community-level social, economic, and physical barriers and facilitators may contribute to health disparities, such as obesity, by impacting behavioral risk factors and via differential distribution in rural, low-income, and minority communities. The study seeks to examine the relative contribution of environmental, psychosocial, behavioral, and biological determinants of health and interpersonal characteristics (e.g., age, race) on BMI of vulnerable preschool children. We are utilizing survey platforms to receive information on each family. We expect to use this information to develop and implement effective health promotion programs in this area, with these specific aims: (1) estimate prevalence of obesity and overweight among vulnerable preschool children in Tuscaloosa and Pickens Counties and to (2) identify risk factors for obesity unique to minority, low-income preschool children.
Abstract:

In an effort to analyze the effects of Naloxone Access Laws, we develop a conditional probability model using a unique dataset on opioid related deaths in the state of Connecticut. We find that increased Naloxone access leads to an increased probability of an opioid overdose given a drug caused death. Instead of helping the epidemic, it appears that Naloxone could be making it worse by creating the illusion of safety for opioid users, where in fact the danger is still incredibly present. We formalize this safety allusion theory with a microeconomic model for the demand of opioid consumption, which depends on the economic agent's perceived probability of overdosing. We present both the econometric model and theoretical model in tandem to present a holistic explanation on how Naloxone Access Laws affect opioid overdose deaths.
Abstract:

Some claim that the lottery is a tax on the poor. State lotteries such as Powerball and Mega Millions provide a lucrative source of revenue. In 2016, Americans spent $80.5 billion on lotto games, up from $73.8 billion the previous year. These state-sponsored lotteries operate as a monopoly that sells directly to its citizens. State lotteries are unique due to their size and commercial marketing. This project was about analyzing lottery demand and the economics and psychological reasons why people buy lottery tickets. Lotteries shed light on economic behavior and choices involving risk. Many people do not follow the expected utility model when buying lottery tickets. Prospect theory provides some explanation for behavior when expected utility theory fails. The main goal of this research project was to find the reasons why the expected utility model does not fit and gain insight on how consumers make economic decisions.
Abstract:

Background/Problem: Alabama currently ranks in the top three for highest adult obesity rates in the United States. Statistically, Alabama has a 35.7% adult obesity rate, which raises the question for youth obesity and whether children to young adults are participating in enough physical activity. Obesity can lead to chronic diseases such as diabetes, cancer, and hypertension, but physical activity is necessary in helping prevent such diseases.

Purpose: The mission of the YMCA, Tuscaloosa, is to allow Christian principles to be practiced through programs that build a healthy spirit, mind, and body for all.

Methods: The YMCA uses Christian values to help make the community of Tuscaloosa feel comfortable to step out of their comfort zone and step into a healthy lifestyle. YMCA promotes wellness through their group fitness classes, personal training, and blood pressure self-monitoring program. This organization is not just promoting wellness to adults, but educating children on how to be healthy physically and mentally. There is a youth development center, afterschool, youth sports, and more to help integrate wellness from children to adults. The YMCA tries to use a freeing atmosphere where members can be who they want to be, for example, Karate and Tai Chi are different activities for a gym, but allows members to try something new. Volunteering is a big contribution to a YMCA that accepts all comers, to which diversifies the communication between members and those who help the organization prosper so others can do the same.

Results: The YMCA is successful in acting as another family to those who want to be apart of the community and organization. As a result, group fitness programs start to become fuller with new people and those people interact. This is important to the community of the YMCA because it promotes wellness of the body and of the mind. The results are what the members and volunteers want them to be, to which allows flexibility for anything to be accomplished through the YMCA. It is not a profitable organization, but it is an organization that allows the community to be themselves and prosper together.
Abstract:

Background/Problem: The University of Alabama faculty and staff are granted with the privilege of having a corporate health promotion and wellness program personally designed to their work schedules and health concerns. With a large portion of our population being overweight, WellBama is designed to help promote fitness by offering challenges, rewards and incentives. Crimson Couch To 5K is only one of many programs offered throughout the year. This seven-week training session offers a free temporary membership to the UA Recreation Center along with seven-weeks of free personal training offered twice per week. Additionally, this specific program also leads up to an event. After the training is completed, a 5K/10K event is hosted by the faculty to see what progress has been made.

Purpose: The mission is to create and sustain a culture of health and wellbeing for UA faculty and staff and their families through a quality program of teaching, research and services.

Methods: WellBama offers free screenings multiple times each year to help maintain proper health. Health information sessions are held weekly to introduce new topics or discuss current issues. Crimson Couch To 5K is designed to motivate employees to get off their couch and accomplish something they haven’t done before. For the more athletic employees, this can easily increase their fitness level and challenge everyone to record a time at the final event. WellBama utilizes Fitbit to bring everyone on campus together and participate in stepping challenges. Employees are asked to be involved in one health screening, one information session and participate in one program each year in order to receive a cash bonus and a healthy reward.

Results: The amount of Crimson Couch To 5K program participants has nearly tripled since last year. WellBama has grown significantly and progress is shown in many different ways. One negative result is the funding cut that has recently decreased the cash incentives for participants.
Student Presenter: Collin Fuqua  
Title: The Reliability and Validity of Commercially-Availably Physical Activity Monitors; A Case Report

Abstract:

Study Objective: The primary aim of this study was to compare three commercially-available wearable PA monitors to a research-grade accelerometer. The authors hypothesize that the commercially-available wearable devices will overestimate total PA in comparison to the criterion research-grade accelerometer.

Summary of Previous Literature: Wearable, consumer-available physical activity (PA) monitors were among the top three most popular fitness trends in 2017, and are projected to grow in popularity. In addition to monitoring PA, many of these devices have the ability to monitor sleep, heart rate, and other vital health information. Due to the rising demand and popularity, many new products are now on the market, however their relative accuracy when measuring PA has yet to be evaluated.

Methods: Total daily ambulatory PA (steps/day) was assessed in a 20-year old male participant over 20 consecutive days. The OURA ring (OURA Health, Ltd., Oulu, Finland), and the Fitbit Flex (Fitbit Inc. Boston, MA) were worn on the participants left hand, with the Apple iPhone X (Apple Inc., Cupertino, CA) carried on the participants left side. The Actigraph GT3X (Actigraph, LLC, Fort Walton Beach, FL) was worn on an elastic belt positioned on the left hip, and aligned with the midline of the left thigh. This Actigraph accelerometer is a small (4.6 x 3.3 x 1.5 cm), light weight (19 gm), device which uses a triaxial accelerometer to measure body motion on three axes at a rate of 30 times per second and sums and stores these body accelerations (“activity counts”) over time. All devices were worn during all waking hours during the study period, except when bathing or during water activities. Daily step counts from each device were compared using repeated-measures ANOVA with simple planned contrasts, with the Actigraph GT3X used as the criterion device. Data are reported as mean ± standard deviation. Statistical significance was assessed using an alpha level of 0.05.

Results: Daily PA ranged from 134 to 11,174 steps/day (6,382.8±3,583.6 steps/day) according to the Actigraph GT3X. The OURA ring significantly underestimated daily PA (4,350.6±2,444.3 steps/day, p=.002), whereas the Fitbit Flex and Apple iPhone X significantly overestimated daily PA (7,412.1±3,298.7 and 7,573.8±2,819.7 steps/day, respectively, both p<.05).

Conclusion: There is tremendous variability in the accuracy of the commercially-available physical activity monitors. With lack of a consistent trend in the errors, caution should be used when using these devices for research data acquisition.

Limitations: The results of this study are potentially limited by the relatively small sample size and should be replicated in a larger sample of participants monitored for a longer study period. In addition, the relative accuracy of these devices should be examined across a wider range of activity levels (i.e. sedentary, moderately active, and highly active individuals), and in a more diverse sample of participants (i.e. age, race, sex). Finally, this study was only capable of examining the validity of these commercially-available devices. Future research should also examine the inter-device reliability.
Abstract:

Background/Problem: Each year, over 1,000 university students volunteer as mentors to help mentees with completing homework, reinforcing reading and math skills and participating in enrichment and recreational activities.

Purpose: Al's Pals Mentorship Program is an organization whereby college students at the University of Alabama donate a significant portion of their time weekly at Tuscaloosa elementary schools to enhance the academic and social lives of inner city youth. The participants of the program often benefit as they learn to engage with individuals of different ages, races, and socioeconomic background. Our mission is for students to get more active and involved; meet fellow students while making a difference in their lives.

Methods: Throughout the mentoring process we will be the role model and special support system for children who are predisposed to academic and/or educational hardship. To accomplish the goals that the organization aims to pursue, volunteers challenged students by providing tutoring in core subjects with thought provoking activities while aiding in the completion of homework assignments.

Results: As a result, students in previous years who participate in the program often prove to be more competent in the areas of reading, writing and math. This is evidenced in the participants' higher-grade averages and improved behavior. Furthermore, student participation in this program has proven to be beneficial in that the participants exhibit heightened level of social and cultural awareness.
Student Presenter: Olivia Gevedon
Title: Price-Gouging of Prescription Drugs in America

Abstract:

Not Publishable
Abstract:

Background/Problem: Flu season usually approaches around October, and can end as late as May. This year’s flu season was, and still is a serious issue for the Alabama Department of Public Health. The flu is extremely contagious and can be contracted through the nasal canal, eye, and or mouth area. Cases are steady increasing around the state, causing Alabama to be in a state of emergency. There are currently 100 reports of flu related deaths in the state of Alabama.

Purpose: The mission of DCH Health System is to deliver high quality, compassionate, community based health services to the communities served through its employees, physicians, and volunteers in a financially responsible manner.

Methods: DCH Health System has implemented several preventive measures to decrease the spread of the influenza virus. Health officials are asking residents to refrain from entering the hospital to visit patients if they feel ill, or have any flu like symptoms. They also have limited one visitor per patient. DCH is requiring all employees, and volunteers to obtain the flu vaccine or wear a mask while in the hospital. After receiving the vaccine employees get a pink sticker on their badge with the words "Flu 2017" which simply means they are protected from the flu. They also have safety signs on the infected patient's doors to notify all hospital employees to take extra precaution when dealing with that patient. Usually, the signs are a bright green, that read "Airborne Precautions" which simply means to clean hands before and after patient care, keep the doors closed at all times, clean patient equipment, and to limit patient transport.

Results: DCH Health System has managed to gain control over the influenza outbreak as of now. The preventative measures have not only decreased the spread of the virus but have also allowed health officials to work together to keep Alabama residents safe, and most importantly healthy.
Abstract:

Fluctuations in economic conditions from Bull market conditions to Bear market conditions (and back) present numerous challenges to organizations. Bear market recessions often drive an inward contraction of focus, whereas Bull market recoveries often drive an outward expansion of focus by countries and their organizations as they respond and adjust to such pendulum swings. As firms' strategies and investment decisions are heavily influenced such changes in economic conditions, and as merger and acquisition (M&A) activity are highly reflective of both, we theorize and empirically examine the implications of such conditions for cross-border M&A (CB M&A) activity to develop new insights for both theory and practice. Our findings highlight how organizations respond to these changing economic conditions, finding that companies respond differently to levels of instability, inflation, and regulations, depending on the state of global economic conditions.
Abstract:

Objective: To identify any adverse effects that arise from the use of modern digital media devices in individuals and how these effects may be addressed among college campuses.

Background: The increased dependence of individuals on digital electronic media, primarily smartphones and laptop computers, is raising concerns among researchers in mental health, education, and public health. Few resources exist to help educate students, parents, school and university administrators, psychologists, and physicians about the adverse effects that result from excessive digital media use. Digital media addiction may be present in all communities that have access to the devices.

Methods: A search of the peer-reviewed scientific literature was conducted in order to create an information resource on digital media addiction. A secondary search of articles in the lay media was also performed. In addition, interviews were conducted with individuals who are currently addressing the issue.

Results: Reliance on digital media devices can result in decreased academic performance, diminished attentiveness and concentration, incivility, poor relationships, and physical, mental, and emotional health problems. Adverse effects on the development of children have also been identified. Teenagers and college students are spending 9 hours a day using digital media. To date, only one university has made steps to address digital media addiction in the form of a digital wellness center.

Conclusions: A growing and alarming body of evidence suggests that digital media addiction is increasing among college students. As dependence on digital media grows, adverse consequences are likely to intensify. More needs to be done in order to address the issue in college campuses and beyond.
Abstract:

Utility companies make most of their revenue through their operations - providing heat, gas, electricity, etc. to their customers. In the last 25 years, however, these companies have sought to explore other streams of revenue while minimizing their own risk. They have done this using derivatives. Derivatives are a contract or financial instrument between two parties which derives a value/price through a core asset.

There are multiple types of derivatives available to these companies, but the one that I focused on with my research were related to the weather conditions and the impact of these conditions on revenue. The amount of revenue a utility company earns is subject to its strength of management, operating efficiency, and infrastructure: like companies in other industries. Utility companies, however, are also subject to wide swings in revenue based on noncontrollable factors - particularly the weather for a given season. The demand of the products sold by these companies (power, gas, etc.) are highly elastic with respect to the weather conditions.

Enter the weather derivative, which allows, for example, a company to hedge against the risk of having a cold summer (in which the utility of air conditioning is less necessary) or a hot winter (in which heating is less needed either). These derivatives are defined by the amount of "cooling" and "heating" days in a given fiscal year, in which the temperature reaches temperature A, or is below temperature B, respectively. If company X doesn't have a certain amount of these "cooling" and/or "heating" days, then they collect money on the contract from the other party. If not, then they pay some of their extra revenue from having the high amount of revenue-friendly days to the other party who took on their risk.

My aim was to see the way in which trading these derivatives both affected net income and market price, and how the derivatives were affected by past success, geography, and time. Not all companies participated in trading these derivatives, but the ones that did traded them in varying amounts with varying amounts of success.

I performed this research by searching through hundreds of historical 10-Ks from these companies for information on each company's use of derivatives and results from usage. I also limited the search to operation related derivatives used to hedge.
Abstract:

Background/Problem: Legal chattel slavery took place over 200 years ago; however, the remnants of this injustice has created a lasting impact on the health of Black Americans. The persistent oppression of Black Americans can be seen in laws that produce unsurmountable stress and adverse health effects. Black Americans bear a well-documented disproportionate burden of disease, injury, death, and disability. To address the gaps in access to resources, America has put in place numerous failing programs that produce added stress. Because America neglected to educate the country of the Black communities' history, lack of cultural competency and awareness exists allowing the health equity gap to continue to widen.

Purpose: The goal of this research is to determine how students thought and perceptions can hinder the eradication of health disparities and health inequity.

Methods: Prior to sending out survey a literature review was conducted for about two months. Topics such as health disparities, chronic stress, perceived discrimination, medical mistreatment and trauma, historical trauma, epigenetics, and residential segregation were fully reviewed and discussed. Surveys were then disseminated throughout the University campus through email, social texting, and handwritten submission.

Results: Although Public Health majors took the survey, something interesting in their answers can be noticed. When asked, the survey participants said they know what health disparities and equity are; however, when asked applicable questions to either topic, their answers contradict. For example: They said they knew what health disparities were and what were the causes of them however, some did not consider lack of access to transportation as health disparity issues. Or some didn't consider poor built environments were an issue when built environments can cause a plethora of issues.

Discussion: The contradiction between what public health students say they know and their applicable knowledge is a bad sign. The focus of the public health profession is to combat health equity and disparities no matter what avenue you choose to take; however, if some future public health professionals don't think remnants of racism still exist what does that say for the health equity gap. Also, thinking in terms of non-public health professionals, what are their thoughts? If public health students don't quite have a grasp on health disparities and their causes, who's to say other students do. These contradicting thoughts and perceptions can only worsen the gap. The foundation of health equity gap can be rooted to a lack of mental health treatment and education during times of slavery and historical trauma. If a public health student lacks the understanding that laws such as the 13th Amendment continues to perpetuate mass incarceration in country, how is it then possible to effectively eradicate the health equity gap when the future public health professionals do not grasp the foundations of the problems.
Abstract:

Background: Substance Abuse is a wide-ranging issue on college campuses that creates long-lasting health issues and problems for substance abusers and for health services, college administrations and the surrounding population. Religiosity and Religious Coping has previously been linked to positive effects on a variety of studies focusing on various types of Substance Abuse. However, college and emerging adults remain as understudied populations in terms of Substance Abuse and Religiosity and Religious Coping. More research needs to be done expanding upon existing studies in order to better serve the many college communities facing these issues. This all begins with the assembly of various types of Substance Abuse among college-aged individuals and Religiosity and Religious Coping's impact.

Purpose: The purpose of this analysis was to review and examine the literature to gather broad, comprehensive definitions for Religiosity and Religious coping, their relationship among college students and substance abuse, and possible future applications.

Methods: A literature review was conducted. Articles were searched, and gathered from The University of Alabama Libraries SCOUT application, and from the National Center for Biotechnology Information's PubMed application. Keywords used to locate the articles include: Religiosity, Religious Coping, Religiosity and Substance Abuse, Religious Coping and College, Religious Coping and Opioids, Spirituality and Religion and College. The search for articles was limited to peer-reviewed and academic journals pertaining to religiosity and religious coping and their relationship with individuals and substance abuse.

Results: Four articles regarding religious coping and substance abuse, three articles concerning religion and substance abuse, and four articles pertaining to religion/spirituality and substance abuse were selected for examination. Of these, five articles regarding religiosity, religion, and religious coping and their effects on collegiate substance abuse were chosen for inclusion in the review. Higher levels of religiosity and religious coping were associated with a protective factor for collegiate non-medical use of prescription medication, marijuana use, hazardous drinking, and emerging adult alcohol use.

Discussion: Religiosity and Religious Coping were associated with positive outcomes for many of the studies done. In many of the cases, a negative association between Religiosity and Religious Coping and Substance abuse was found. This implies that higher levels of Religiosity and Positive Religious Coping led to lower levels of Substance Abuse, or served as a protective factor. These results can be examined for their possible implementation in various prevention and recovery programs.
Abstract:

Introduction: Health research in Nicaragua is sparse compared to the United States, and most data available are exclusive to laboratory and hospital records collected in the capital city of Managua. Therefore, there is little evidence-based data describing the health conditions affecting the second poorest country in the western hemisphere, especially in the rural regions of the country. Regional differences in health data can provide crucial information to delivering adequate healthcare. Therefore, the purpose of this study was to characterize health attitudes to community health needs in Granada, Nicaragua to provide possible effort for improvement.

Methods: An oral survey was conducted with 106 adults at a free primary health clinic in Granada, Nicaragua. The survey was conducted in Spanish and responses were self-reported detailing demographic and socioeconomic characteristics, health behaviors, nutrition, and chronic conditions. Responses were collected with Qualtrics software and interviews were audio-recorded to conduct thematic coding on testimonial evidence.

Results: Majority of participants were female (67.9%), under the age of 70 (83.0%), married (40.6%), unemployed (67%), and patients of the clinic (88.7%). Results indicate that 66.7% of participants do not use any method of contraception; 47.2% of participants do not take vitamins; 44.3% of participants had been diagnosed with diabetes; 46.7% of participants had been diagnosed with hypertension; 90.5% of participants ate less than two servings of vegetables daily, and 78.3% of participants had feelings of depression. The most popular chief complaint presented in the clinic was diabetes maintenance (36.8%).

Discussion: Many of these health conditions are explained by cultural values, income level, such as machismo, access to healthcare, and education. The findings from this exploratory study aids in the understanding of factors affecting health in and around Granada, Nicaragua. Because the prevalence of chronic conditions is much higher in this sample than published national statistics, this study demonstrates the need for efficient public health interventions and further research defining social determinants of rural Nicaraguan health. This study also highlights the specific need for education on nutritional practice, exercise, and contraceptive use.
Abstract:
Phishing, or the malicious use of emails and fraudulent websites to solicit sensitive and private information, has plagued both domestic and international businesses at increasing rates. From October 2013 to December 2016, global phishing attacks incurred a loss of $5.3 billion international dollars and cost American businesses an average of $500 million apiece. On top of these significant financial losses, phishing attacks jeopardize a business's global reputation, clientele loyalty and trust, classified information, and modern day's most valuable asset: time. While these tremendous complications continue to threaten the commercial industry at exponential rates, corporations are desperately searching for the most affective defense tactics, strategies, and methods for protecting against phishing attacks.

This growing desire to combat and protect against fraudulent scams inspired and proposed a question: How does an employee's degree of mindfulness impact their ability to detect and avoid phishing attacks? Likewise, as an extension of this research, how does an employee's fatigue influence their ability to identify identical threats? To evaluate these questions, an experimental design involving the manipulation of UA employees' fatigue and mindfulness has been proposed. Through random selection and random assignment, University employees will be allocated into four experimental groups, entitled A, B, or C, and a fourth, un-manipulated, control group. Faculty members assigned to group A will undergo both mindfulness training and phishing attack simulations to evaluate the effects of such instruction. On the other hand, employees designated to group B will not receive any mindfulness training, but will endure fatigue manipulations as they are exposed to the same phishing attack simulations as group A. Group C members will confront all three manipulations, mindfulness training, fatigue manipulation, and phishing attack simulations, to serve as a significant contrast to the control group, which will only encounter the phishing attack simulations. Within all four groups, employee vulnerabilities to the phishing attack threats, based on their various fatigue and training levels, will be measured and recorded as the number of attacks in which the subjects are victimized.

Since fatigue reduces both accuracy and speed in mental tasks by blocking working memory and decreasing vigilance, it is projected that subjects who are experiencing elevated fatigue levels will be more susceptible to phishing attacks. On the other hand, as an employee's degree of mindfulness is increased through sufficient rest and training, his/her ability to detect and avoid phishing attacks will be increased. By understanding how these various mental states and preparedness can reduce or heighten an employee's susceptibility to phishing, businesses will be able to curtail significant losses in productivity and revenue. Similarly, with the results of the experiment, corporations will be able to promote protected and insured work environments by instituting practices that limit stress and fatigue and elevate mindfulness and attention to optimum levels.
Abstract:
Justification: Based on declining levels of new business ventures, motivation to find entrepreneurial opportunities has shifted in recent years. With new technology, such as Uber or Lyft, individuals who have entrepreneurial goals find a low-risk intermediary in these companies. However, information on how this has impacted entrepreneurship is lacking.

Purpose: We plan to examine how the growth of alternative work arrangements impacts the risks and rewards of entrepreneurship through three main questions:

1. How do an individual’s characteristics, such as their desire for flexibility and autonomy, their level of risk tolerance, their career goals, and their desire to become an entrepreneur, impact their propensity to view themselves as entrepreneurs versus employees when engaging in gig economy work, and to what extent is participation in the gig economy used to provide security and resources that allow individuals to engage in other entrepreneurial endeavors outside of the gig economy?

2. How do individuals perceive the risks and rewards associated with engaging in the sharing economy as compared to engaging in traditional employment, and how are the working relationships between sharing economy service providers and technological intermediaries similar to, and different from, traditional employer-employee work arrangements?

3. How does an individual’s view of the nature of their relationship with the technology intermediary impact their engagement and commitment to the activity and their eventual performance? Do they view the technology intermediary as a traditional employer, as an ally who enables entrepreneurship, or as an adversary, and how do these factors impact the individual’s engagement in and commitment to this activity and their eventual productivity and performance?

Method: We will gather primary data from three hundred individuals who drive for ride-sharing services. Survey questions will focus on their relationship with the ride-sharing services, their level of engagement in and commitment to their sharing economy activities, and their overall performance. In the second year, we will only focus on those drivers who indicated they are entrepreneurs or who are interested in becoming entrepreneurs. We will follow up with these drivers with a more detailed survey to capture their progress and success, their attitudes towards whether engaging in the ride-sharing helped move them toward their entrepreneurial goals, and their attitudes towards the ride-sharing services.

The first wave of data will be analyzed cross-sectionally using a variety of statistical techniques ranging from content analysis to moderated multiple regression. We will code responses to open-ended questions about driver motivation, perceived risks and rewards, desired career path, and reasons for engaging in the sharing economy. The second wave of data will be analyzed longitudinally with a focus on drivers who indicated a desire for an entrepreneurial career. We will again use open-ended questions and individual differences as predictors, but we will focus on changes in career intentions and driver-company relationships. In both, we will triangulate the results of qualitative and quantitative survey responses to predict categorical outcomes using multiple logistic regression and continuous outcomes using hierarchical regression.
Abstract:

Zika virus is an infectious disease which became prevalent throughout the Western hemisphere in early 2015. Zika is transmitted by Aedes mosquito species -- namely, Aedes aegypti -- which live primarily in urban slums; Zika is also sexually transmitted. Though Zika appears clinically as a mild fever in adults (a much less severe disease than that of its genetic cousins, dengue and chikungunya), in pregnant women the disease can manifest as severe congenital birth defects including microcephaly, making the long-term socioeconomic impact of Zika on national productivity potentially severe. Due the suddenness of the Zika epidemic through the Western hemisphere and Latin America, the WHO in 2016 declared Zika a Public Health Emergency of International Concern. Interestingly, however, Cuba was not affected by Zika to the same degree as its Latin American neighbors. This author's past research on the prevalence of Zika in Latin America focused on the hypothesis that directing funding against Zika through existing channels and health systems for dengue, malaria, and HIV would be the most effective and efficient method to combat Zika, due to its biological and sociological similarities to those three diseases. Cuba has exceptionally strong preventative health systems for those same three diseases, and this author believes that this is the major reason for Cuba's success in combating Zika -- the nation's ability to capitalize on existing systems and simply modify them towards the new disease. As such, Cuba serves as an excellent case study of the application of previous health policy recommendations made by the author. Further, this author explores how Cuba's society and style of government contributed to the nation's success in combating Zika, and the greater role of civil society in infectious disease.
Session 3: 12:30-2:00 | Computer Science, MIS, Cybersecurity, Statistics; Business; Health Sciences
Category 2: Completed Work
Poster Number: 50

Student Presenter: Sara Kazyak
Title: Effects of Isoflavone Consumption on Risk Factors of Cardiovascular Disease in Post-Menopausal Women

Abstract:

Not Publishable
Session 3: 12:30-2:00 | Computer Science, MIS, Cybersecurity, Statistics; Business; Health Sciences
Category 2: Completed Work
Poster Number: 43

Student Presenter: Cassidy Kelley, Ambley Chambers
Title: Defining Successful Feeding: An Evidence Based Systematic Review

Abstract:

Defining Successful Feeding: An Evidence Based Systematic Review

Objective: The purpose of this evidence based systematic review (EBSR) was to determine the variables reported in the literature that are used to define "successful feeding" in neonatal intensive care units (NICU) and to determine if there are any differences in the variables used by practitioners from different disciplines (i.e. therapy and nursing).

Background: Successful feeding is a developmental milestone that must be reached for an infant to qualify for discharge from the NICU. A common measure of feeding success has been volume of intake; however, this objective measure alone does not adequately describe feeding success. In recent years, a focus on the quality of feeding and not just the quantity of intake during feeding has emerged. This additional focus on quality coincides with the addition of multidisciplinary teams to care for infants born prematurely.

Methods: First, clinical questions of interest were determined by a multidisciplinary team of researchers with experience working in neonatal care. Search parameters were then identified. Inclusion criteria were as follows: published in English, in peer reviewed publication, published between January 2007 and September 2017, and the article must discuss or provide objective criteria for successful feeding. Four databases (PubMed, CINAHL, JBI, COCHRANE) were searched systematically with predetermined search strings. Two researchers searched each database independently and results were reviewed with a third researcher. Consensus was reached on all articles included in this evidence based systematic review.

Results: Initially, 68 total abstracts were identified that were thought to report on some objective criteria of "successful feeding" within the NICU. After review of abstracts, 16 articles were pulled and read in their entirety. Thirteen articles met inclusion criteria and were included in the final analysis. Of the 13 included articles, 6 (46%) of them did not provide any objective criteria for "successful feeding". Of the articles that provided criteria, 3 of them were written by the same author. Of the 7 articles that used criteria, 3 were from medicine and 4 were from therapy. 18 criteria were identified, of those, 10 (56%) were objective criteria. Only 2 (20%) out of 10 were used across both medicine and therapy.

Limitations: Study results were limited by inclusion of only peer-reviewed articles published in English.

Conclusion: Results indicate successful feeding is not clearly defined in peer-reviewed literature. There are key differences in the parameters used by professionals in both medicine and allied health to define successful feeding. The only two variables used by researchers from both medicine and allied health were physiologic stability and infant state.
Abstract:

The average American investor often seeks financial return through intermediary institutions rather than directly purchasing securities in financial markets. This practice might overstate the amount of financial literature on competitive and efficient security pricing in comparison to that on competitive behavior between firms. The financial system is structured so that retail investors are forced to rely on a network of firms to determine which investment fund is best suited for their need. Consumers of financial products, like mutual funds, may not face a competitive environment when making a selection because of the heavy reliance on private ratings as a filter for what retail and commercial banking institutions present to customers. This study borrows from the contest literature in economics to empirically show how mutual funds may employ rent-seeking activity to attract investment capital. We use mainstream fund ratings as a proxy for the theoretical rent that fund managers seek out to increase their share of available consumer savings. We use a panel of information on U.S. open-end mutual funds and link their historical performance to their overall Morningstar rating. Evidence on performance is mixed and we provide a further discussion of the resulting implications.
Abstract:

Justification: Body Mass Index (BMI) is a weight to height ratio that is often used to designate whether a person is underweight, healthy, overweight, or obese. However, it does not account for the overall fat and fat-free mass of a person; specifically, BMI does not account for what percentage of a person's mass is made up of fat, bone, muscle, or water. In recent affairs, there has been much discussion among the public regarding BMI and physical health. Specifically, this discussion has revolved around President Trump regarding his physical health. This study seeks to analyze and understand the precision of BMI when assessing if a person is a healthy weight; whether BMI is a precise measurement when using BMI to predict a person's Body Fat Percentage. A BMI value of 30 and higher is classified as obese. A BMI value between 25.0 to 29.9 classifies a person as overweight. A BMI value of 18.5 to 24.9 classifies a person as a healthy weight. A value less than 18.5 classifies a person as underweight. BMI needs to be further investigated due to athletes who have high BMI's, such as Mr. Olympia body builders, having very small body fat percentages. While at the same time, other individuals, such as President Trump, can have the same BMI, yet have a higher Body Fat Percentages. Such inconsistencies draw attention to the precision of BMI in its ability to classify a person as obese, overweight, healthy, or underweight, due to it providing similar values for certain individuals, despite differing Body Fat Percentages.

Purpose: The purpose of this study is to determine the relationship between Body Mass Index and Body Fat Percentage in College Aged Men and Women.

Methods: Thirty-eight men (age = 23.9 ± 5.2 years, height = 179.0 ± 8.2 cm, weight = 58.9 ± 9.0 kg) and twenty six women (age = 22.2 ± 4.4 years, height = 164.2 ± 6.0 cm, weight = 82.9 ± 13.6 kg) of college age volunteered to participate in the study. Height and weight were taken for each subject to determine BMI. The laboratory technique called the 4-compartment (4C) model was used to measure BF%.

Results: Mean ± standard deviation BMI for men was 26.0 ± 4.9 kg.m-2 and for women was 21.8 ± 3.1 kg.m-2. Mean ± standard deviation BF% for men was 15.2 ± 5.9% and for women was 26.5 ± 5.7%. The correlation between BMI and the 4C BF% was significant (p < 0.01) for men (r = 0.72) and women (r = 0.60).

Conclusion: The study indicates that BMI correlates with BF% in college-age men and women. However, the correlation was not perfect, which suggest that BMI may not be a useful surrogate of BF% in college-age individuals.
Abstract:

A starch-guest inclusion complex forms when a guest compound is placed in the central space of an amylose helix. This supermolecular structure is stabilized by hydrophobic interactions between the guest and the interior surface of the amylose helix. Starch-guest inclusion complexes have many potential applications, including food and nutrition formulation, and drug delivery. Their functions vary when binding to different guest molecules. The purpose of this review is to investigate the recent developments in starch inclusion complexes with non-traditional guest molecules and their implications in food and nutrition. These non-traditional guest molecules include carbon nanotubes, synthetic polymers, and fluorescent dyes. It is concluded that starch-guest inclusion complexes have a great potential to be applied to food technology and other fields, and further studies on the applications of the inclusion complexes are suggested.
Student Presenter: Catherine Lamont, Lauryn Woodyard, Katter Longshore
Title: Determinations of sEMG Values of Oral-Facial and Pharyngeal Musculature During Normal Swallowing

Abstract:

Not Publishable
Abstract:

Previous research has indicated that sex-related differences physical activity (PA) and sedentary behaviors (SED) among college students. In addition, college-age females spend more time using their cell-phones than college age men. PURPOSE: The purpose of this study was to determine if PA, SED, and cell-phone addiction (CPA) differed between male and female college students. METHODS: Participants (n=1120, 19.7±1.6 yrs, 67.1% female, 90.6% Caucasian, 5.2% African American) were recruited via email and self-reported all responses online. PA (MET-min) and SED (minutes per day) were assessed using the IPAQ-short. Cell-phone addiction (CPA) was assessed using the cell-phone addiction scale, with responses ranging from 0 (lower addiction) to 28 (higher addiction). Sex was classified as female, male, or other (0, 1, and 2, respectively). ANOVA was used to assess differences in the independent variables (PA, SED, CPA) between sexes. RESULTS: Female students reported more SED (431.5±188.2 vs. 407.8±169.6 min, respectively; p=.041), and reported higher CPA (18.6±4.9 vs. 16.2±5.1, respectively; p<.001) than male students. In addition, female students reported engaging in less PA (5235.9±3558.8 vs. 5828.5±3578.6 MET-min, respectively, p=.009). CONCLUSION: Female college students reported greater SED, higher CPA, and less PA than male college students. Future research should examine these sex-related differences with objectively measured PA, SED, and cell-phone use.
Student Presenter: Victoria Lewis, Brittany Tretter

Title: DOMAIN-SPECIFIC CORRELATIONS BETWEEN PHYSICAL ACTIVITY INTENSITY AND CELL-PHONE ADDICTION IN COLLEGE STUDENTS

Abstract:

Cell-phone use is often associated with physical activity (PA) in young adults. Individuals who report engaging in more vigorous and moderate PA report lower cell-phone usage when compared to individuals who are less physically active. PURPOSE: The purpose of this study was to determine if PA and sedentary behaviors (SED) varied as a function of cell-phone addiction (CPA). METHODS: Participants (n=1130, 19.7±1.6 yrs, 66.9% female, 90.4% Caucasian, 5.4% African American) were recruited via email and self-reported all responses online. Using the IPAQ-short version, total, vigorous- (VIG), moderate- (MOD), and walking- (WALK) were measured in MET-min; SED was assessed in minutes per day. CPA was assessed using the Cell-phone Addiction Scale, with responses ranging from 0 (lower addiction) to 28 (higher addiction) and stratified in to groups (LOW, MID, HIGH) using a tertile-split. Bivariate correlations between each intensity component of PA, SED, and CPA were assessed using Pearson's r. ANOVA was used to assess differences between CPA groups. RESULTS: CPA was inversely associated with total-, VIG-, and MOD-PA, and positively associated with SED, (r=-.108, -.154, -.072, and .067, respectively; all p<.05). CPA was not associated with WALK-PA (r=.011; p=.711). The HIGH-CPA group engaged in less total-, VIG-, and MOD-PA than the MID- and LOW-CPA groups (all p<.05). No between-group differences were observed in WALK-PA or SED (both p>.05). CONCLUSION: Higher CPA appears to only be associated with lower VIG- and MOD-PA, and may not be associated with lower intensity activities or SED in college students.
Abstract:

In 2011, League of Legends, a multiplayer battle arena created by Riot Games, held its first World Championship to the peak viewership of 210,000 simultaneous viewers. In 2017, League of Legends held its seventh world championship to the peak viewership of 60 million simultaneous viewers. eSports are becoming bigger and bigger each year with the involvement of NBA teams and large sports organizations trying to enter this growing competitive gaming arena. My research dealt with why have competitive gaming not only in the League of Legends realm gained such a large following, and for my senior project I researched three games and looked at why/why they weren't successful, the major players in their professional and business growth, as well as looking at the format of the competitive nature of the game itself. Video Games and the growth of eSports show a trend of the want to consume media that lasts much longer than the typical movie or other internet media source. eSports wants to be considered a legitimate sport and why shouldn't it with the viewership numbers outranking the World Series, and the Super Bowl its hard not to see why eSports should take that next level and start considering itself the next evolution of sports and sporting events around the world. In my presentation I want to talk about eSports and how looking at three genres can showcase the projection of its growth for the next few years, and also this presentation can serve as an entry point for anyone who doesn't know or want to know more about the world of electronic sports and its culture.
Abstract:
The United States Department of Health and Human Services identifies in its national health initiative the priority that all people, including the most vulnerable, should have health that allows them to have a productive life by the year 2030. Healthcare access is becoming increasingly complex as a growing and diverse population and rapid healthcare reform continue to modify the provision of healthcare services. Improving healthcare access, reducing geographical variability in health outcomes, and eliminating disparities are major social and political issues.

Diabetes self-management education (DSME) has been shown to improve diabetes outcomes. National DSME standards call for an integrated approach that includes clinical content and skills, behavioral strategies (goal setting, problem solving), and engagement with psychosocial concerns. Clinical trials have well-established the beneficial effects DSME can have on blood glycemic control and complication reduction. The most current evidence-based algorithm for the comprehensive management of type 2 diabetes (T2DM) now recommends lifestyle therapy in the areas of nutrition, physical activity, sleep, behavioral support, and smoking cessation. DSME programs function to promote informed decision-making, effective self-care behaviors and active collaboration with healthcare teams to improve clinical outcomes, health status and quality of life.

While the state of Alabama has the second highest adult diabetes rate in the nation it is alarmingly only 55% of adults diagnosed with diabetes in Alabama had ever attended a diabetes DSME class. The purpose of this study is to determine the proportion of the Alabama population with geographical access to DSME services and identify geographical areas of limited coverage. The study will use U.S. Census data and a Geographical Information System to measure distance by travel time to DSME services that have either been recognized by the American Diabetes Association or accredited by the American Association of Diabetes Educators. Further analysis will then be conducted to analyze the percentage of the population with access by rural status, age, education, race, sex, and socioeconomic status. The framework used in this research will be the Model for Assessment of Potential Geographical Access adapted from the Andersen's theoretical framework Behavioral Model of Health Service Use.
Abstract:

Justification and Purpose: Airbnb has become one of the largest sharing economy networks on the internet. Host on Airbnb can range from in experience a retired couple with a spare bedroom to a career real estate agent. We have discovered that there are very few tools that can accurately help a host with the pricing and marketing of their space, which puts people with little experience in real estate at a major disadvantage. Airbnb currently has a tool that gives a price suggestion, but we have concluded that this tool does not analyze enough data to give an accurate appraisal. The main factors the Airbnb tool looks at are location, time of year, and the price of competing properties. The goal of our research is to discover if we can use factors such as reviews, price of local hotels, accommodations offered, host interaction and others to determine a more accurate price for each listing, and then use this data to create a tool that gives host advice on how to price and market their listing.

Method: Dr. Yuanyuan Chen, a MIS professor here at UA, had the original idea for this research. I, Grant Logsdon, got involved through the Culverhouse Faculty Scholars Program. Our main goal is to create a consulting tool that host can use to discover how to best price and market their listing. We decided that the best way to do so would be to look at past data from Airbnb listings in different cities. The data sources that we found most useful are Inside Airbnb and Tripadvisor. Inside Airbnb offers free datasets in .csv format for Airbnb listings in different cities around the world. These data sets contained the exact type of information we wanted to capture and analyze. We picked 5 cities across the world, and downloaded a years worth of data from each. Next, we mapped out a relational schema for the database and began to see how all the data fits together. We are currently in the process of inserting the data from the excel files into the SQL database. After this we will begin to scrape data on the hotels in corresponding cities and insert it into the database. We hope that this information will give us the tools we need to discover what prices and accommodations attract the most customers.

Result: The research we are conducting is still in progress. We are discovering however that there is a significant correlation between the amount of information host display on the listing page, and the amount of time that the listing is rented.
Abstract:

Food scarcity is prevalent among low-income communities, and this is an issue that directly affects the Tuscaloosa community. Families may not know where their next meals are coming from, and kids may only be able to eat at school. Through the West Alabama Food Bank, located in Northport, AL, they are able to service multiple counties in west Alabama. They provide meals to churches, schools, and communities to offset the food scarcity in those communities. The food bank maintains sponsorship with large-scale vendors to make sure the food they distribute is nutritious and of high quality. This non-profit organization assesses the needs of their target communities and provides meals for them. This requires those who work for the food bank to go out to these communities and engage with those who live there. As a volunteer, I help assemble meal bags and boxes that will be distributed in these communities. There are new objectives and goals each time I volunteer, however they all have a purpose for the organization to run efficiently. Ultimately, the way results would be measured would be meeting the targeted amount of meals necessary for a community. It would be making sure that each student at the school got a meal bag or that the families who are designated to receive boxed meals actually receive them.
Abstract:

Combatting the cycle of poverty in the Blackbelt of Alabama must begin with the efforts of a community. In Marion, Alabama in particular, the work begins with Frances Ford at her non-profit, Sowing Seeds of Hope. The purpose of this project-based research is to equip the Marion community with the necessary tools to be able to confront the deep poverty that pervades the rural Alabama town. We aim to work with Mrs. Ford and her organization, not from a hands-down approach, but through hand-in-hand work ethic, deliberately assisting within and throughout the community. By working with Mrs. Ford and speaking with members of the community, we will assess the needs of Marion as it pertains to job-readiness, healthcare, and housing.

As a non-profit, Sowing Seeds of Hope serves the community by confronting poverty with a multifaceted approach. The inextricable connection between job-readiness, healthcare, and housing as the means of attaining economic and social mobility allows Sowing Seeds of Hope to have an effectively and holistically address the needs of Marion. By offering computer classes in addition to owning a community computer lab, the nonprofit provides resources that are not ordinarily and readily available to the rural Alabamian, assuaging the need for technology as a necessity for being successful in the workforce. In addition to the need for jobs, Sowing Seeds of Hope also addresses housing inequality and the need for stable living through their Self-Help Housing Program. Finally, to address the deep need for health care in Marion, the organization provides care ranging from Medicaid registration to dialysis to food accessibility. Sowing Seeds of Hope, and Frances Ford herself, tackle these issues on a daily basis, and we will be a part of confronting these needs that make poverty so persistent in Marion.

It is our hope that our project further solidifies the foundation that Sowing Seeds of Hope rests upon. We will work to get the foundation more funding in addition to strengthening a variety of the community programs. Our work will root itself in the health statistics that are prevalent in Marion, but most of all, the needs of the community will determine our actions moving forward.
Abstract:

As robots become a larger part of our everyday lives it is vital to understand the human perception of trustworthiness of robots. These human perceptions can influence the acceptance, integration, and effectiveness of robots in society and our lives. This project aims to develop a theory that explains humans' perceived trustworthiness of robots. In order to develop this theory we will design, run, and analyze multiple studies to better understand the factors that affect the perception of trustworthiness. The form, function, and abilities of potential robots will be manipulated in these studies to better understand how each affects the perception of trustworthiness. It is also important to consider individual human characteristics to observe how these traits change the perception of trustworthiness. Understanding this perception is especially important when considering integrating robots in the workplace. One aim of this project is to produce a conference paper that bridges the gap between academia and industry by providing suggestions for effectively establishing robots in the workplace.
Abstract:

This study aims to find a link between occupational physical activity and memory encoding activity in the brain. Encoding is the first step in creating a memory and is associated with attention. If a person struggles with attention, then they never encode the information, even if they have been presented with it. Recently, the anterior cingulate cortex has been seen as an important part of the encoding process. Although generally, the hippocampus is considered the main brain structure associated with memory, the anterior cingulate cortex could be an important pathway for encoding before stimuli are consolidated into memories. There is a gap in the literature surrounding occupational physical activity. Past research on physical activity, in general, has mainly focused on acute bouts, or short bursts, of physical activity, but occupational physical activity may be a good indicator of lifetime fitness. In this study, we collected self-report data on participants' physical activity both at work and recreationally from 49 participants, including young adults (ages 20-30), middle-aged adults (ages 50-63), and older adults (ages 64-75). These results have been coded from low occupational activity to high physical activity on a scale ranging from 1 to 5 and will serve as the independent variable. After the survey, participants completed memory tasks while in an fMRI that measured for brain activity. The participants were shown several face-object and face-scene pairs. They were told that they would need to remember these pairs for a later memory test. For the memory test, they were shown a face and asked to pick from 5 options: two previously seen scenes, two previously seen objects, and a “never before seen” option in case that face was not one of the ones previously shown. One of the four pictures was previously paired with the face. I predict that people who are more physically active in their daily job will show higher levels of activity in the anterior cingulate cortex. I also predict that participants who rated themselves as having more physically demanding jobs than others their age will show more activity in the anterior cingulate cortex than those who rated themselves as having lower occupational activity levels. I plan to control for both age and recreational activity to isolate only occupational physical activity as it relates to levels of anterior cingulate cortex activity. Results will be analyzed using a multiple regression model with physical activity and perceptions of activity as the predictor variables, age and recreational activity as covariates, and brain activity during encoding and cognition as the outcome variables. By understanding how occupation physical activity relates to encoding, we may have a better understanding of how lifetime fitness could impact attention, cognition, and brain health.
Abstract:

Technology, though many see it solely as a benefit to society, has significant impact on issues of equality and the well-being of minorities in our society. A drive for efficiency over justice and equality relates to the realms of data science, social media, and hardware. Bias in data science affects the models used to judge and categorize us, changes in social media affect the users on the platform, and lack of consideration in hardware effects if we are able to successfully use technology.

The reflection of society's problems appears in data science with policing software and hiring practices. Software dependent on big data chooses which areas to police and is used to determine sentences. These systems are dependent on the geography of where crimes are reported, but even though this may seem to eliminate bias from the equation, there are large problems. It is statistically proven that police are more likely to perform stop and frisks on young Black and Latino men. Even if a software system is designed to be equal, if the inputs and data are biased, the output will also be biased. These practices are not only present in our criminal justice system, but in our workspaces with models that help sort through resumes. Big data puts added setbacks to already disadvantaged populations. There is not only bias in the software that is used as a way to manage people, but also in the software that people use themselves. Social media has a growing issue of social sites blocking LGBT content as sensitive. Restrictions such as these contribute to the demonetization of the work that LGBT content creators make. Demonetization economically disadvantages those that talk about more sensitive topics like their experience with race or being LGBT, contributing to a cycle of oppression and disadvantage. Technology not only affects the systems around us, but the systems that we use ourselves. Bias is not only a problem in software, but a prevalent issue in VR and facial recognition technology with how programmers encode hardware and who they prioritize. Many rudimentary VR systems made women nauseous and sick whenever they used them. Without acknowledging the impact of their inattention, the VR systems were encoded in a way that prioritized how men perceive the world. Bias has not only been encoded in how we use technology to see, but with how technology sees us as well. Examples of facial recognition technology not working as intended for people of color show bias in technology continues to affect how people of color use and are seen by products.

Programmers need to consider the positive impact of justice and equality in their models and systems instead of just prioritizing efficiency. When bias is encoded into the prominent technology fields of data science, social media, and hardware, it has unjust impact on minorities who are affected by and use these systems.
Abstract:

Though TOR, otherwise known as the Onion Router, has been around since 2002 and free to the public since the late 2010s, it remains largely in the shadows of the research world despite its increase in usage. As criminologists, we hypothesized that, due to the sense of safety and security that anonymity provides an individual, illegal activity, particularly weapons trafficking, would be common on the darknet. Our project focused on the AlphaBay international marketplace, a darknet equivalent of the clearnet's eBay. We wanted to know what types of weaponry were being sold, from what countries, for what price, and in what quantity. We also were interested in learning about the way that these products were advertised by vendors. To achieve these goals, we utilized a web crawler, which allowed us to capture a web scraping from AlphaBay while the site was still active. The data from the scraping was cleaned and coded to yield a catalog of all weapons postings on the site at the time of the crawl.
Abstract:

According to the Centers for Disease Control, Alabama had the United States' worst infant mortality rate (IMR) in 2014. In 2015, the IMR for white residents was 5.2%, but among black and other residents it was 14.4%. The goal of this project is to provide geographical data and case studies to better understand the implications of Alabama's IMR and to address factors in the overall gap in treatment between demographic groups. This project includes geographical analyses using rates of infant mortality by county, location of hospitals with and without obstetric centers, rural and low income communities across Alabama, and demographics including race. Data suggest the IMR tends to be highest in rural counties, and especially those with fewer hospitals in the region. There are some counties with no hospitals with obstetric wards located in them, generally concentrated in the Black Belt region. Additionally, those counties with more demographic minorities tend to have a higher IMR than those that do not, and tend to be farther from hospitals with obstetric centers. Interestingly, it was also found that there are differences in counties that exhibit the largest white and minority infant mortality rates. Case studies of birth experiences from low-income minority women in rural areas were compared to case studies of higher income women from urban and suburban areas. Obstetric care experience satisfaction among rural-dwelling low-income minority women was very different than among urban- and suburban-dwelling high-income women. These narratives, when combined with geographical analyses, elucidate treatment gaps in underserved populations that inform where improvement can be made in Alabama's obstetric care.
Abstract:
This study seeks to identify how differences in income levels within suburban populations affect access to health care, and compare this to what people in other location demographics experience. Previous studies have shown that, contrary to popular belief, suburban populations may encounter unique barriers to health care. However, there is little research on this topic. The purpose of this study is to further identify whether people living in suburbs face exclusive challenges in obtaining access to health care. This is achieved by analyzing demographic and health care access data collected through the Behavioral Risk Factor Surveillance System (BRFSS).
Abstract:
When faced with sickness, Andeans have long made use of both traditional as well as modern healing methods to seek relief. While they continue to use local means of medical treatment, such as herbs, home remedies, and resort to healers, social and environmental changes in recent years appear to have hampered their ability to do so. This project will help to assess the continued availability of traditional medical options by assessing the knowledge of remedies (home, traditional, or biomedical) for 10 common illness conditions, including culture-specific sickness such as susto (fright illness) and cross-culturally recognized ailments such as kidney infection. Knowledge of a past population is compared and contrasted to current know-how, both qualitatively and quantitatively. While knowledge is surprisingly similar across time periods, less detailed explanations nowadays may be attributable more to a breakdown in the traditional system due to populations shifts and climate change than to a lack of either interest or consumer demand.
Abstract:

Neural networks have recently become the state-of-the-art for language translation for their ability to generate more fluid and grammatically correct sentences. However, one area where neural machine translation (NMT) models fall short is the translation of rare and compound words, the latter of which are especially common in morphologically rich languages such as German, Russian, and Turkish.

For language translation, a neural network must have a fixed number of input categories (known words in the source language) and output categories (known words in the destination language). Hence, the sizes of the source language and destination language vocabularies must be fixed. Consequently, an NMT model cannot properly translate a word that is not in its source vocabulary. Similarly, the model cannot translate to unseen words in the destination language.

Previous research efforts translated text on a character-by-character basis, letting all the possible characters for a language serve as the vocabulary. This shrinks vocabulary size and allows for any word to be translated, but it makes training neural network models much slower.

A more popular approach is to break words into subword units. First, all the words in the text used to train the model are completely split into their component characters. Then, in a process known as byte-pair encoding, the most common pair of characters is combined or "merged" into one symbol, and the process is then repeated with the next most common sequence. The various partial words remaining after these merges serve as the vocabulary.

With the subwords approach, researchers fix the number of merge operations at an arbitrary number, such as 60,000, but one size does not necessarily best fit all contexts. The ideal number of merge operations could vary with the language pair or the domain of the text (news versus biomedical). This project seeks to optimize the number of byte-pair merges for a given translation task.
Abstract:

Background/Problem: The need for a wellness program at The University of Alabama was recognized by the Faculty/Staff Benefits Committee, the Faculty Senate, and administrators in April 2005. There was a need for a program to integrate and coordinate current available resources for wellness; assess the perceived needs of employees for health promotion, prevention, disease management and population health management; engage and establish a culture of wellness within The University of Alabama.

Purpose: To create and sustain a culture of health and wellbeing for UA faculty and staff and their families through a quality program of teaching, research and services.

Methods: The Office of Health Promotion and Wellness coordinates multiple efforts towards promoting faculty/staff health on campus. WellBama, the office's public health initiative focuses on education, program development, and engagement. WellBama offers educational meetings, called group sessions, once a week focusing on different health topics. They also do free weekly health screenings, where participants can track various aspects of their health throughout the school year. The office develops different contests and activities to promote community engagement. The development of better social media activity and content has been important in presenting information in a new way, rather than just through website and newsletter presentation.

Results: The Office of Health Promotion and Wellness has been integral in helping serve the faculty and staff population at the University of Alabama. The office has created a dynamic program, WellBama, that addresses many of the health care needs displayed by Alabama personnel. WellBama has helped create a much more health conscious and inclusive environment that allows for personal and community growth. The growth of the social media aspect of the office has helped make the program even more accessible.
Abstract:

Alzheimer's Disease (AD) is a progressive, neurodegenerative disease that leads to memory loss, behavioral changes, and the inability to perform everyday tasks. Certain risk factors, such as having a parent with AD, confer a risk for developing the disease in old age, although the mechanisms underlying this risk are understudied. Though it remains unknown when the earliest signs of brain deterioration occur, proposed a priori regions of interest, including the hippocampus and the posterior cingulate cortex, may demonstrate some of the earliest signs of dysfunction. The hippocampus and posterior cingulate cortex are involved in long-term memory, spatial recognition, and intrapersonal thought. The present study used data from the Human Connectome Project, which serves as a source of data for the structural and functional connectivity of the human brain. These data provide a gateway to understand the causes, variabilities, and neural pathways involved in certain neurological disorders. In a group of young adults aged 22-35, we investigated how having a parent with AD impacts brain function and structure in regions that show abnormalities in early stages of AD. Fourteen young adults with a parent with AD were matched with 14 young adults without a parent with AD. Resting brain activity and brain volume were compared between groups in the hippocampus and the posterior cingulate cortex. We hypothesized that participants with a family history of AD would experience increased mean resting brain activity and smaller volumes in these brain regions. Hyperactivity might signal the beginning stages of a larger systemic failure in the brain, and smaller brain may suggest early neurodegenerative processes. Confirming our hypotheses, we discovered that young adults with a parent with AD showed greater resting mean activity and smaller volumes in the left hippocampus compared to young adults without a parent with AD. These measures of brain function and structure were not correlated with one another. Regardless of brain measure, the posterior cingulate cortex did not reveal any differences between groups. Consequently, we concluded that having a parent with AD was associated with early aberrations in brain function and structure that appear to be independent. This early hippocampal dysfunction may be due to aberrant neural firing, which may suggest a noisier resting state system in individuals with a family history of AD. Such hyperactivity may eventually lead to overuse of the hippocampus throughout one's lifespan and a result in a diagnosis of AD in old age.
Abstract:

Prosocial behaviors are performed every day by front line employees. The present study aims to explore the effects of racial bias on perceptions of these prosocial behaviors. Participants are to be recruited through Amazon's MTurk to complete the study. The variables will be analyzed using a 2 X 2 X 2 between subject factorial design. The 3 different independent variables are the race of the customer, the race of the employee, and the level of prosocial behavior. Each of these independent variables have two levels: white-black, white-black, high-low respectively. The dependent variable being studied is the perception of the prosocial behavior performed by the employee. Data will be analyzed through ANOVA tables, and racial bias will be used as a control variable to improve validity and reliability. The Symbolic Racism Scale will be used to measure the racial bias of participants. The study will look to answer three different hypotheses. First, when the race of the employee and customer are congruent the prosocial behavior performed will not be devalued. Second, when the race of the employee and customer are noncongruent the prosocial behavior performed will be devalued. Third, when the customer is black in a noncongruent relationship the prosocial behavior will be devalued more than noncongruent relationships involving white customers. Note, data collection has not yet begun for the current study.
Student Presenter: Alexie Moskowski
Title: SEDENTARY BEHAVIOR IS ASSOCIATED WITH PHYSICAL ACTIVITY AND CELL-PHONE ADDICTION IN YOUNG ADULTS

Abstract:

Screen time and cell-phone addiction is often associated with sedentary behavior, especially in college students.

Purpose: The purpose of this study was to determine if physical activity (PA), cell-phone addiction, and sleep was associated with sedentary behavior (SED).

Methods: Participants (n=1114, 19.7±1.6 yrs, 67.1% female, 90.7% Caucasian, 5.1% African American) were recruited via email and self-reported all responses online. PA (MET-min) and SED (minutes per day) were assessed using the IPAQ-short. Cell-phone addiction (CPA) was assessed using the Cell-phone Addiction Scale, with responses ranging from 0 (lower addiction) to 28 (higher addiction). Sleep was reported in average hours per night. Groups of SED (LOW, MOD, HIGH) were created using a tertile-split. Bivariate correlations between PA, CPA, and SED were assessed using Pearson's r. ANOVA was used to assess differences between SED groups.

Results: SED was inversely associated with PA (r=-.15, p<.01), positively associated with CPA (r=.07, p=.03), and not associated with sleep (r=-.05, p=.11). The LOW SED group engaged in more PA (6015.7±3795.7 MET-min) than the MOD SED (5493.5±3491.0 MET min) and HIGH SED (4690.3±3305.3 MET-min) groups (p<.01). In addition, the LOW SED group reported lower CPA (17.3±5.1) than the HIGH SED group (18.2±5.2) (p=.04).

Conclusion: Young adults reporting greater SED engage in less PA and report higher CPA, providing a link between cell-phone use and PA. Future research should examine these associations with objectively measured PA, SED, and cell-phone use.
Abstract:

According to the Satter Eating Competence Model, eating competent individuals possess internal regulators that encourage the individual to consume sufficient food for energy and body weight stability, and have the skills to properly organize healthful family meals. By extrapolation of this definition, in the context of feeding others, it is expected that eating competent individuals would be more likely to intend to (or encourage their partner to) breastfeed their children for at least six months of the infant’s life. The objective of this study was to effectively identify a correlation, if any, between eating competence and breastfeeding intentions.

The Theory of Planned Behavior proposes that the immediate antecedent to a behavior is the intention to perform that behavior. Theoretically, increasing breastfeeding initiation and duration is reliant on increasing people's plans to breastfeed. Therefore, the purpose of this study was to examine intentions to breastfeed future children for at least 6 months and factors associated with these intentions. College students represent an ideal population to study given most have not yet had children.

Using a cross-sectional study design, 421 undergraduate students from a major southeastern university were asked to complete a survey measuring intentions to breastfeed future children for at least six months, consideration of future children’s nutrition, eating competency (an indicator of healthy attitudes toward eating), fruit and vegetable intake (an indicator of healthy eating behaviors), and demographic information.

Participants completed the randomly administered survey anonymously. Intention to breastfeed for at least six months was measured on a scale from one to five (1 = No Intention, 5 = Strong Intention) in one of two ways: female participants indicated their own intention, while male participants indicated their intention to encourage their partner to breastfeed.

All analyses were done at a .05 confidence level. Breastfeeding intentions were more likely in female participants than in male participants (\(\bar{x}_{female} = 4.268, \bar{x}_{male} = 3.978\)). Individuals that met both daily fruit and vegetable recommendations were also more likely to breastfeed (\(\bar{x}_o = 4.107, \bar{x}_{met} = 4.640\)). Additionally, participants enrolled in the colleges of nursing, commerce, or human environmental sciences had greater intentions to breastfeed than those enrolled in other undergraduate colleges.

This study represents a first step in understanding breastfeeding intention among college students. This research may lead to the development of future breastfeeding education models.
Student Presenter: Megan Nichols
Title: West Alabama Food Bank: Secret Meals/ Backpack Meals

Abstract:
Not Publishable
Student Presenter: Courtney Oleksa
Title: Creating a Partnership with the Board of Dental Examiners of Alabama to Analyze and Improve Dental Professional Wellness within the State of Alabama

Abstract:
This project seeks to examine the overall wellness of professionals in the dental field, concentrating on those practicing dentistry in Alabama. A partnership with the Board of Dental Examiners of Alabama has been created to broaden the scope of this project by allowing our research team to identify true industry concerns and survey a larger audience. Ultimately, this study aims to address industry concerns such as the shortage of providers, particularly in rural areas, and the occurrence of mental health and substance abuse issues in dental professionals. Evaluating the climate in which providers work, the different educational levels found in offices, and the range of relationships formed in a dental office setting will allow for the identification of the drivers and outcomes that contribute to these large-scale industry issues. Both qualitative and quantitative data will be collected through an electronic survey sent via email to dentists and dental hygienists. The research project will begin with an initial survey and has the potential to become longitudinal in nature and allow for subsequent studies. Our hope is that the findings of this study will be significant in the Board's expansion of the programs and conversations already in place surrounding these issues. Recognizing the factors that contribute to lack of wellness in providers and finding feasible solutions will not only improve the job satisfaction of providers, but also the quality of care offered to patients.
Abstract:

Background: Depression is the most common mental health disorder; is the leading cause of ill health and disability worldwide; and causes immense morbidity, suffering and escalating rates of suicide. Prevention and treatment efforts are immensely inadequate. National health objectives outline the strong need to increase the proportion of adults with mental health disorders who receive treatment. Numerous barriers interfere with people receiving treatment including (but not limited to) lack of number of and quality of mental health services; lack of access to facilities that provide mental health services; lack of accurate information regarding mental health; and perceived negative stigma regarding depression and other mental health conditions. Overcoming these barriers is crucial and challenging. The use of technology has been suggested to assist with the provision of mental health services and to overcome specific barriers. One proposed method is the use of technology in the form of mobile applications. Mobile applications have been used with success for other health issues and therefore warrant examination for assistance with depression. Most adults spend an average of 2 hours, 7 minutes a day on mobile apps. Utilizing mobile apps may help to avoid mental health stigma to receive help, treatment, or to access information.

Purpose: The purpose of this study is to evaluate current mobile apps available through the Apple App Store targeting depression for usefulness, readability, usability, and integration dimensions.

Methods: The search term "depression" in the Apple App Store will be used to identify the top depression focused apps for the iPhone/iPad. Apps not in English and those that do not target adults 17+ years of age will be excluded. The top depression focused apps according to user rating (1 to 5 stars) and cost (paid versus free apps) will be downloaded from the Apple App Store and evaluated using the three dimensions of evaluation criteria for mental health apps. Additionally, apps will be evaluated for readability and quality of depression information.

Discussion: This study will attempt to assist in overcoming numerous barriers that interfere with people receiving mental health services. The use of technology requires no travel and people can maintain a level of privacy when utilizing technology. The results of the evaluation of depression mobile apps will help provide insight on how to improve these applications in order to deliver accurate, engaging and effective education and treatment. Recommendations to improve applications will be provided regarding cultural and linguistic appropriateness.
Abstract:

Identification of vehicle tags, even partial ones, can be very beneficial in the correct apprehension and identification of criminals who flee crime scenes in vehicles. Security footage from crime scenes is often of poor quality, meaning that if there is a license plate, it is likely that it cannot be properly identified due to image skew, graininess, and blurriness. To simulate this scenario, but on a larger dataset, video data of vehicles was obtained. These videos were then segmented to create images at the rate of one image/video frame. The goal of this research is to increase the ability to identify the location and content of vehicle tags using localization and Optical Character Recognition (OCR) algorithms. We hope that by utilizing a localization algorithm in conjunction with an OCR algorithm an increased success rate is achieved when compared to only running the OCR algorithm on the images.
Student Presenter: Evan Pickard
Title: A Comparison of Global Healthcare Systems

Abstract:
Not Publishable
Abstract:

An online long-term monitoring web portal was developed to store, analyze, and display both historical and future data pertaining to environmental site monitoring. Increased attention is being given to long-term monitoring of sites because often times the best available solution is natural attenuation, which may take decades. Long-term monitoring practices require numerous monitoring points, strict monitoring schedules, and individual monitoring thresholds that if exceeded trigger remedial action. It is important that all data pertaining to a site is housed in a single location that allows the data to be easily retrieved. There are many different kinds of data that relate to long-term monitoring of environmental sites such as documentation, geographic information, and attribute data. The online portal developed in this project houses historic and new data and is able to query that data by location, time interval, constituent, and concentration range. The portal is able to handle data from various modeling programs as well as PDFs, spreadsheets, and images. This allows data related to a sampling location or an area to be viewed on a map, in tabular form, or on charts and graphs. For example, a selected property parcel would show environmental covenants on the property and can also display sampling locations and laboratory results. The online portal provides access to information and design decisions that may have been made years before the current custodian of the site was involved in the project.
Student Presenter: Aiyana Saferite
Title: Potential Drug Leads for the Prevention and Cure of Alzheimer's Disease

Abstract:
Alzheimer's Disease has emerged as one of the great medical challenges of the 21st century. Currently approved drugs do not prevent neurons from further degeneration and are used only to manage cognitive symptoms. There has been evidence suggesting that a dysfunction of the stress response system may be crucial in the development and progression of Alzheimer's Disease. In our project, we have focused on the Wnt-beta catenin pathway as one of the stress response signaling pathways. After a thorough literature review, a screening of plant extracts for pharmacologically active metabolites activating Wnt-beta catenin pathway is being conducted. In addition, new bioassays have been designed to discover new drug templates present in the complex natural matrices. The purpose of this project is to overcome the limiting factors faced by current drugs on the market through these pathway-activating drug templates.
Student Presenter: Joe Salek  
Title: Characteristics of Contributors to Open Source Software Applications Mozilla and Gnome

Abstract:

This research uses data from the Open Source Software (OSS) applications Gnome and Mozilla. The goal of this research is to find trends in the variability of long term contributors' (LTCs') work environments and involvement so we may more accurately assess the probability of new contributors' chances of becoming LTCs. This information would ultimately allow researchers and OSS platforms to have a better understanding of what environments promote and increase the number of LTCs, furthering the software's functionality and troubleshooting ability. This research is based off of the work by Minghui Zhou and Mockus, A., which appears in the academic journal IEEE Transactions on Software Engineering.
Abstract:

Since the Great Recession, there has been increasing concern about the stability of the banking system in the United States. In particular, some institutions were so large that they were deemed "too big to fail." In light of these events, the objective of this research is to study the role of banking concentration and its relation to banking fragility in the U.S. As a benchmark, previous research examines the role of concentration for large scale banking crises using data on banking concentration across different countries. Moreover, most of the existing studies lump banking activity in developing countries along with activity in industrialized countries to study the issue. However, it does not seem reasonable that the factors associated with crises in developed financial systems would be the same as in less-developed countries. Furthermore, in contrast to previous research that looks at failures at the economy-wide level, our work studies the incidence of bank failures in the United States at the individual bank level from 1984 - 2017. To do so, we plan to use detailed individual bank characteristics along with various measures of overall concentration in the banking system in the U.S. to investigate the probability of an individual bank failure. To accomplish this, we began by pulling data on historical individual bank failures from the Federal Deposit Insurance Corporation and matching it with information on the characteristics of each bank obtained from the Federal Reserve System. Now that this lengthy process is complete, we will begin conducting statistical analysis of the determinants of bank failures using rigorous econometric analysis.
Abstract:

Currently there is minimal research on the healthcare access and disparities in Nicaragua. We are composing this study as an exploratory investigation to further add to the body of literature regarding clinical and demographic statistics of health care and stress. Previous research has proven that socioeconomic status and stress play a role in the mental and physical health of a population. (Trauer et al. 2006; Hernandez et al. 2005; Khan et al. 2006). This research stems primarily from basic health issues that can be seen quite frequently on a daily basis in the Nicaraguan society. These basic health issues or statistics, such as common diet, health care availability and knowledge of health, are yet to be researched and quantified in some parts of Nicaragua. Additionally, the research that will be performed there will have a section that measures the stress of individuals. How does the culture and society of Nicaragua affect the stress of the individual? Quantitative and qualitative data will be collected via twenty minute oral interviews with volunteers. With all of this data, we, as researchers, hope to compare these statistics to those of individuals in different cultures, such as here in the United States. Moreover, this new research will hopefully shed some light on some basic issues that occur on a daily basis in Nicaraguan society. The goal of this research isn't necessarily to spark instant intervention or help from outside societies, but rather to explore and inspire others to conduct research to add on to the very little or misunderstood information that exists about Nicaragua.
Abstract:

Objective/Justification: Public service positions provide opportunities for individuals to learn about public policy and to interact with a wide range of people. Studies show that volunteering in service positions can be educational and transformative (Kim & Morgul, 2017; Miller et al., 2002), but questions remain about how the experiences of volunteers compare and contrast with the experiences of paid professionals in similar positions. Whether the various motivations, rewards, and meanings differ among the two groups is an important facet of the individual experience, which may imply greater significance for the public service industry.

Purpose: Our study aims to compare and contrast perceptions of personal transformation and policy knowledge among volunteers and paid professionals who helped people sign up for health care coverage. The study addresses the following questions: Among those who worked in paid positions or as volunteers to help people sign up for health care: (a) What were the primary motivations? (b) What were the primary rewards? (c) In what ways was the experience transformative? (d) How did the experience affect policy knowledge? Through coding analysis and the identification of themes, we expect to find more prevalent personal transformation among volunteers, and more prevalent policy knowledge among paid professionals.

Method: The study involves secondary qualitative analysis of interviews conducted with volunteer and paid health care "navigators" from Alabama. Twelve participants were identified via snowball sampling: six volunteers and six paid professionals. Open-ended interview questions focused on experiences and perceptions of the position and the health care law. The interviews were taped and transcribed. Using NVivo software, the transcripts are being coded to create "in vivo" and "axial" codes following a simultaneous coding method (Saldana, 2015). Codes will be classified to identify themes and address the study questions, with the following main classifications: motivations, rewards, transformation, and policy knowledge. Themes among volunteer and professional participants will be compared and contrasted.
Abstract:

Recent advancements in electroencephalography (EEG) based brain-computer interfaces (BCIs) have led to applications that allow users to control devices such as wheelchairs, prosthetic arms, drones, and gaming systems using cognitive commands. However, software environments used to create these technologies are often designed for expert developers. This research poster investigates the feasibility of JavaScript as a development platform for non-critical BCI systems. We also discuss the current issues with JavaScript-based BCIs and introduce a new library, WebBCI, which is designed to take the initial step towards addressing these issues. Initial benchmarks of WebBCI suggest JavaScript can run common EEG and BCI methods such as band power extraction, common spatial pattern, and linear discriminant analysis in real time on an array of devices, including mobile phones.
Abstract:

Background/Problem: Child abuse and neglect is a serious global problem that can be in different forms such as physical, sexual, emotional or just the neglect of providing what a child needs. These are some of the factors that can leave a child with long-lasting psychological damage. A child is abused or neglected every 47 seconds in The United States.

Purpose: The mission of The Child Abuse Prevention Services is to provide services for the treatment and prevention of child abuse.

Methods: CAPS provides education children, parents and the community at large through community based and school based programs. CAPS starts with early childhood home visitations. The best way to prevent child abuse is through simple support for children and parents. CAPS staff and Board of Directors overall goal is to ensure every child has a right to grow up in a safe, nurturing home and community. CAPS has several programs that helps educate and nurture children on child abuse such as Nurturing Parenting/Children's Program, Second Step Program, Child Protection Unit, Nurturing Baby Program, Seminar on Shaken Baby Syndrome, Understanding Prenatal Drug Exposure and Preventing Child Abuse.

Results: The Child Abuse Prevention Services has been actively working in their community on preventing child abuse. CAPS encourages everyone to do their part to notice the signs of abuse. There are multiple programs to educate and prevent child abuse from occurring. CAPS does something in the community every week to spread awareness. From their hard work and dedication the numbers of Child Abuse cases have went down in Tuscaloosa.
Abstract:

Would you be willing to put your life in the hands of a robot? If not, what decisions regarding your life would you be comfortable allowing a machine to make? As the field of artificial intelligence continues to grow, we are allowing intelligent machines to take up an increasing number of our responsibilities. At some point, it seems that these machines will be given the same level of responsibility that we would entrust to other humans. But what should such responsibility entail? For example, should a machine be blamed for a wrongful decision it makes, or should its maker be held accountable instead? In this study, we seek to answer these questions by exploring differences in how we attribute moral blame to intelligent machines and humans. We hope to increase our limited understanding of the perception of intelligent machines in order to bridge the widening gap between the fields of artificial intelligence and psychology.
Abstract:
Advances in mobile and payment technologies have allowed consumers to complete transactions simply by scanning, tapping, or swiping their mobile device on or near a point of sale device. This process streamlines the current cash and plastic card process while increasing the transactional security and protecting consumer financial information. Despite the convenience and consumer interest in using mobile payments, adoption of mobile payment is sporadic and conflicting across different countries. While Kenya and Sweden have largely implemented mobile payment technologies through necessity and convenience, the United States lacks the same widespread adoption. Using a survey instrument, we plan to test a model of mobile payment adoption and actual usage to help explain the different factors underlying the greater diffusion of mobile payments in Kenya and Sweden as compared to the United States.
Abstract:

A popular subfield of topology, knot theory, revolves around the question of how circles can be embedded in 3-dimensional space. These embedded circles, called knots, can be manipulated up to isotopy, allowing for two knots to be considered equivalent if there is an orientation-preserving homeomorphism of \( \mathbb{R}^3 \) which takes one knot into the other. To distinguish different types of knots we use knot invariants, which are quantities computed for each knot that are equal for all equivalent knots. Recently, homological invariants that categorify other popular knot invariants have developed; however, determining the computational complexity of these new homological invariants has not been actively studied. This project centered on this question, focusing on the relationship between the complexity of computing the Khovanov Homology invariant and the complexity of computing the signed Bollobas-Riordan-Tutte Homology invariant.
Abstract:

My research centered around the oligopolistic nature of the following five high-technology firms: Apple, Amazon, Facebook, Microsoft, and Google (hereafter referred to as the "Fearsome Five"). I theorized that the extreme total market share (roughly $3 trillion) held by the Fearsome Five would affect mergers and acquisitions (hereafter referred to as "M&A") in the high-tech industry. These firms could use their capital to purchase smaller firms, thus decreasing competition and innovation in their industry, as well as deceasing outside funding from venture capital firms. In my research, I sought to answer the following three questions:

1) What does an optimal Fearsome Five target firm look like?

2) What are the subsequent outcome implications for the target firm after being acquired by a member of the Fearsome Five?

3) What are the industry-wide implications of the Five's M&A outcomes?

For this study, I will conduct a quantitative study, using a long-term stock performance analysis. My dependent variable is firm performance, measuring the stock value of each target and acquiring firm one year pre-acquisition; and one year, three years, and five years post-acquisition. My independent variable is the age of the target firm in question.

Previous research has overlooked the need for a target-side approach, and has failed to question the industry-wide effect. My research has direct implications for all modern consumers, as the firms' products in question are used multiple times a day. A more thorough investigation into the Fearsome Five's M&A activity is enlightening for both high-tech firms and high-tech consumers.
Abstract:

Background: The state of Alabama is facing a shortage of healthcare providers, particularly in rural areas. Sixty-two of Alabama's 67 counties have been designated as whole or partial health professions shortage areas, or HPSAs, in which there are not enough physicians to meet the needs of the population. Only two of Alabama's 54 rural counties (Coffee and Pike) are not entirely or partially classified as primary care shortage areas. There are 4.1 primary care physicians per 10,000 people in Alabama's rural counties compared to 7.9 for urban residents. Not having enough healthcare providers creates a lack of access to healthcare for rural Alabamians, which contributes to disparities in health outcomes. Life expectancy at birth for rural Alabamians is half a year lower than that for urban Alabama residents and 3.5 years lower than that for the nation.

Purpose: The vision of the West Central Alabama Area Health Education Center (AHEC) is to reduce health disparities by improving the quantity, diversity, distribution and quality of Alabama's healthcare workforce. The mission of the West Central Alabama AHEC is to enhance access to quality health care, particularly primary and preventive care, by improving the supply and distribution of healthcare professionals in underserved Alabama communities through community and academic educational partnerships.

Methods: Studies show that medical students originally from rural areas are more likely to work in rural areas upon graduation. West Central Alabama AHEC offers health exploration programs for students in grades 9-12 within their 13-county service area, in the hopes that these students will enter the health professions pipeline and return in the future to address their communities' health needs. West Central Alabama AHEC offers a variety of high school programs, including the Dixie AHEC Scholars Program (D.A.S.P.), the N.E.R.D. Summer Enrichment Program, and free health career preparation workshops. In January 2018, the University of Alabama College of Community Health Sciences announced their partnership with West Central Alabama AHEC on additional health-related programs for high school students.

Results: West Central Alabama AHEC has reached hundreds of high school students since 2013. Its partnerships with academic institutions, including The University of Alabama, The University of West Alabama, and The University of Alabama at Birmingham, have strengthened the quality and reach of these high school programs. For my internship this semester, I am analyzing data from the National Student Clearinghouse to help West Central Alabama AHEC determine whether or not the high school programs are accomplishing their goal of increasing the number of students from rural Alabama who enter health-related academic programs. My efforts to evaluate the high school programs' impact are ongoing.
Student Presenter: Gabriel Ward
Title: It's Too Much: The Negative Impact of Service (Over) Recoveries on Customer Satisfaction and Intentions

Abstract:

Marketing research shows that a firm's response to a service failure is critical in retaining consumers, as both positive and negative service recovery outcomes have a compounding effect on the perception of the service provider (Bejou and Palmer 1998; Reichheld and Sasser 1990). The firm's response, or service recovery effort (a tangible offer) is the most significant influencer of a service recovery situation, as "the higher the level of atonement, the more significant the improvement in the level of satisfaction" (Boshoff 1997). Additionally, customers who experience a service failure, followed by a satisfactory service recovery, had higher repurchase intentions than initially satisfied customers (Gilly 1987). Though there has been ample research examining the importance of service recovery and appropriate levels of atonement (Allen et al. 2015), the potentially negative effects of a positively disproportionate or overly generous service recovery have not been explored. The present research focuses on service recovery efforts, that are incongruent with the service failure, and according to extant theory should result in increased levels of satisfaction and positive behavioral intentions. However, this work suggests that firms can "over-recover" from service failures resulting in negative customer outcomes such as reduced levels of satisfaction, and repatronage intentions. This research contributes to the current service recovery literature by providing a more nuanced view of service recoveries and the negative impacts associated with service over-recovery, and provides guidance to practitioners on how to properly recover from inevitable service failures.
Abstract:

Background: Childhood dietary habits often persist into adolescence and adulthood, and if deleterious, these dietary patterns can negatively influence overall health. Specifically, the consumption of excess fats can contribute to decreased cardiovascular health including endothelial dysfunction, inflammation, and plaque deposition. In the population of children with feeding difficulties, deleterious dietary habits are prevalent due to sensory hypersensitivity, specific food preferences, and parent-child stress. The consequences of these feeding difficulties often lead to reliance on processed foods, often with increased fat content. It is, therefore, plausible to consider that this population may be at a higher risk for cardiovascular disease if these dietary habits persist into adulthood.

Objective: To determine the relationship between problematic pediatric feeding behavior and nutrient intake in children referred to the University of Alabama Speech and Hearing Center.

Methods: Eleven children ages 2-6 years referred to the Clinic with feeding difficulties were observed for assessment of oral and motor skills as well as anthropometrics. Their guardians completed a three-day food record to assess usual dietary intake and the Behavioral Pediatric Feeding Assessment Scale (BPFAS). The BPFAS was used to assess clinically significant feeding difficulties through the estimation of a total problem score (TPS) and total frequency score (TFS) for which these feeding problems occurred. After adjusting for energy intake, correlational analyses were conducted to assess the relationships between TPS or TFS and dietary intake. Dietary intake was compared to Adequate Intake (AI) recommendations set forth by the National Academy of Medicine Health and Medicine Division.

Results: All eleven participants (63.6% male, 4.64 ±1.29 years) had TPS and TFS higher than the cut scores for ascribing clinically significant feeding difficulties. Non-significant positive trends were noted between folate and TPS (r= 0.619, p= 0.056) and TFS (r=0.613, p= 0.059), suggesting a reliance on processed foods which are commonly fortified or enriched with folate. A reliance on processed foods is further suggested through the inverse relationship although non-significant between fiber and TFS (r= -0.62, p= 0.055). The relationship between TFS and fiber suggests that texture may play a role in sensory hypersensitivity because healthier foods groups such as vegetables and fruits contain higher fiber content compared to processed foods. Compared to AI recommendations, 63% of the participants exceeded daily intake of fat whereas 81.8% met recommended intake of carbohydrates and protein.

Conclusions: Data from this study suggest that this small cohort of children with feeding difficulties consume excess fat and minimal fiber. Together, these can negatively impact future cardiovascular health. An expanded sample size is warranted to determine the underlying cause of increased fat intake in this population, as well as to determine potential interventions with diet and mealtime strategies for improving dietary variety and nutrient balance.
Abstract:

Unemployment and the stock market performance have both been the subjects of extensive research within the fields of economics and finance. The unemployment rate is, after all, one of the most reported statistics regarding economic performance. Despite this, there is few research available for how the two interact. This research aims to look into this with an eye towards the first few hours of trading after the unemployment rate is announced by the government. Institutional investors place little, if any, emphasis on the unemployment rate when deciding how to make transactions, but there is still potential for the market to respond to the rate's publication in some way. Independent investors don't always have the resources or experience that formally trained institutional investors take advantage of. As a result, these actors are expected to act less rationally on a case-by-case basis and in that case their actions should manifest somehow in the market as a whole. This initial study includes data visualizations and explorations of potential relationships between the unemployment rate and the stock market. By comparing the changes in volatility of the S&P 500 index from a few trading days before the release of the unemployment rate to that of the day immediately following and the change in unemployment rate from one month to the next, we examine any possible impact of the publication of the unemployment rate on the decisions of traders. This reaction could be one of the ways in which less rational actors impact the market and cause inefficiencies.
Abstract:

Background/Problem: The older Veterans need to be taken care of through long-term health care and mental health care services. These Veterans are at the age where they cannot take care of themselves anymore and it is hard for their families to do as well.

Purpose: The mission of the Tuscaloosa VA Medical Center is to serve America's Heroes by improving their health and well-being through Veteran and Family Centered Care.

Methods: The Tuscaloosa VA Medical Center provides the primary care that eligible Veterans in the VA Southeast network need with dignity and compassion. This center also provides access to secondary and tertiary care services. At this center, they are fed breakfast, lunch, and dinner. They are provided with any snacks or drinks they may need. Some days they will also have entertaining activities for the Veterans to participate in. They have their own personal rooms and bathrooms. They are provided with assisted care for hygiene. Overall, the TVAMC provides many, many different healthcare services such as barber services, mental health care, and respiratory care. Their values focus on integrity, commitment, advocacy, respect, and excellence.

Results: The Tuscaloosa VA Medical Center is very effective in improving the Veterans' mood and their sociability. By taking care of these Veterans, they are improving their health and preventing injuries from happening. When the Veterans are happy and feel pleased with how they are taken care of, the employees can feel satisfied that they are doing a good job. The families can feel comforted knowing that their loved ones are being taken care of in a safe environment.
Abstract:

Needles and pain are the top-rated fear of children with regards to healthcare experiences. As injections are a routine component of a child's visit with a pediatrician, many studies have been completed on ways to pacify this anxiety. The Buzzy is a tool designed using the gate control theory to reduce pain by closing pain signals to the brain using cooling and vibration. The tool has been shown to improve patient experiences with IV's and blood withdrawals. The purpose of this study is to examine the effectiveness of the Buzzy on minimizing self-reported and observed pain in children ages 3-10 when receiving an injection. Children receiving injections during a pediatric visit were randomly assigned to one of two groups: the Buzzy group (e.g., receive the Buzzy intervention during their injection) and the control group (e.g., receive routine care during their injection). Parents were asked to complete a demographic questionnaire and a Faces Pain Scale-Revised regarding their child's perceived pain. The children were asked to self-report their pain on a FACES Pain Rating Scale. A researcher also recorded their observations with the Faces Pain Scale-Revised and a Behavioral Observation Pain Scale. Results showed parents observed pain approached significant difference between the two groups (p =.089). Parents also observed differences in pain levels between genders, reporting girls displayed more pain than boys (p =.014). Finally, children between 4-7 were observed to verbalize distress more frequently than their counterparts, ages 8-12, during the injection (p =.049).
Student Presenter: Mark Wiegreffe  
Title: Extracting and Cleansing Open Source Data for Analysis

Abstract:

Study Objective: To extract and cleanse software error reporting open-source data in order to further analyze the data and draw conclusions about the behavior of error reporting repository contributors.


Researchers at Peking University published over 774,000 error reports over fifteen years from both the Gnome and Mozilla application error reporting databases. This data contains numerous attributes such as the who reported it, the severity, the date, the resolution, and other pertinent information. One of the main ways this data was collected was by using crawlers through the user interface, however, Mozilla unusually agreed to provide the researchers with an official download. The researchers also discuss the importance of organizing data into multiple levels. Cleaned and analyzed data in higher organizational levels can be traced back to the original line that was extracted from the source thereby allowing for better understanding and verification of the integrity of the cleaned data.

Proposed Method: The project I am working on involves analyzing open-source data from the error reporting systems of the Mozilla Platform. Since this is my first semester working on a project of this type, I have been engaged mainly thus far in the process of learning the relevant foundations of data cleansing. I started by reviewing the relevant literature to get a better introductory understanding of how the open-source data was collected, how it is currently organized, and potential research questions than can be answered with further analysis of the data. Other than learning about and reviewing the relevant literature, I have set up a SQL database and connected it to an IDE. I have used previously developed Perl scripts to extract multiple levels of the open-source error reporting data and imported them into my database. Currently I am working on ensuring the integrity of the extracted data. Once this is complete I hope to begin looking at different research questions that the data can be used to help answer about software error reporting and the behavior of contributors to software error reporting communities.
Abstract:

A district governor for Rotary International must visit every chapter in his or her district within a certain time frame and budget. Each chapter holds a weekly meeting at a specified time and location. On top of weekly meetings, one or more chapters can hold occasional fundraising events. In order to attend a meeting at every chapter, the governor must occasionally stay overnight at either a host's house or a hotel. The problem to be solved is creating a travel schedule for the district governor so that he or she visits every chapter and meets any combination of the other objectives. Objectives specific to this problem include maximizing the number of meetings and fundraisers attended, minimizing the total distance traveled, and minimizing the number of nights spent away from home.

In order to generate the travel schedule, we created a computer program in C-Sharp. This program utilizes input files including chapter names, meeting locations, meeting times, host locations, and more. Using information from the files and inputs from the user regarding travel period, meetings to attend, and others, the program formulates an optimization problem for the user. Once the problem is generated, a map will populate showing the locations of each meeting, host, and the governor's home. Then the program solves the optimization problem, populates travel routes on the map, and produces a schedule that can be reviewed by the governor and chapter presidents. If any issues arise, the user can identify problematic areas in the solution and the program will generate a revised schedule in an interactive and iterative process. Our preliminary work involving the North Alabama district has resulted in 52 chapters and a planning horizon of sixteen weeks, creating a network optimization problem with approximately one thousand nodes and over 500 thousand arcs. Solving this problem is challenging with off-the-shelf optimization software, thus we are investigating efficient algorithms to solve the emerging problem.
Abstract:
This paper describes the internship I spent with Al's Pals Mentorship Program in Tuscaloosa, Alabama. Al's Pals is a community outreach program, that serves elementary students in 1st through 5th grades at local school sites around the areas of Tuscaloosa and Northport. I describe the structure of the Mentorship Program and its responsibilities to the communities it serves, as well as the students and volunteers who participate. I will also explain the intricate details of each job presented within the program, and break down some difficulties and barriers that can impact the functioning of the child and their relationships with the mentors. I will also describe the relativeness of the internship with Al's Pals, as it relates to Public Health, the experiences I had with my mentees and other volunteers, and the short and long-term effects of my participation on the program.
Session 3: 12:30-2:00 | Computer Science, MIS, Cybersecurity, Statistics; Business; Health Sciences
Category 1: Work in Progress
Poster Number: 95

Student Presenter: Houston Wingo
Title: Simulations For Next Generation Sequencing Technologies

Abstract:
Not Publishable
Session 3: 12:30-2:00 | Computer Science, MIS, Cybersecurity, Statistics; Business; Health Sciences
Category 1: Work in Progress
Poster Number: 42

Student Presenter: D'Kota Wyatt
Title: Sleep and Cortisol Levels in Early Childhood

Abstract:

Not Publishable
Session 4: 2:30-4:00 | Arts & Humanities; Engineering
Category 1: Work in Progress
Poster Number: 75

Student Presenter: Henry Abrams
Title: Rapid Photonic Annealing of Perovskite Solar Cells: A Pivotal Step in Developing Printed Solar Panels

Abstract:

Not Publishable
Student Presenter: Emily Adams
Title: The Lost Cause: How to Perpetuate a Myth

Abstract:

Not Publishable
Abstract:

Slaves had a prominent role in building the University of Alabama, yet most students are unaware of the fact that the University once owned slaves. A study was conducted to gauge undergraduate student's preexisting knowledge of this topic, and to gain insight into the depth of understanding students had on the history of slavery on campus. A survey on the public perception of the history of slavery at the UA was conducted among a sample of 143 undergraduate students. No public acknowledgement of the history of slavery on UA's campus has occurred since 2004, with the Faculty Senate's decision to formally apologize. This official apology was used in the middle of the survey to measure student's current perceptions of this topic. The survey had four main parts. The first part included questions about student's preexisting knowledge of the topic. The second part included the official apology that students were asked to read. The third part had questions that addressed the level of students' knowledge about the document as well as their sentiments about the overall effectiveness of UA in communicating this history. The fourth part was basic demographic questions. The study found that over half of the people surveyed, 53.85%, said they are aware of the history of slavery on campus. Approximately 76.62% of respondents who said they were aware of slavery on campus were not aware of the faculty senate's decision to apologize in 2004. Of the people who said they were aware, 70.13% of people responded that the university was not effective in communicating the history of slavery. These results showed that students with preexisting knowledge about this topic were not aware of the apology in 2004, concluding that the university is not effective in communicating certain aspects of this topic.
Session 4: 2:30-4:00 | Arts & Humanities; Engineering 
Category 1: Work in Progress 
Poster Number: 79

Student Presenter: Hani Alsuwaylih
Title: Smart Shingles for Energy-Efficient Buildings

Abstract:

Not Publishable
Abstract:

High entropy alloys (HEA) have received considerable attention in the materials community due to their favorable properties. With the use of CALPHAD modeling we can help to assess these new materials with respect to phase formation and oxidation behavior. In this work, HEA-based coatings are produced on Ni-based superalloys via magnetron sputtering. The coatings are then annealed to stabilize the microstructures before being subjected to oxidation exposures. The resulting microstructures are then characterized using a scanning electron microscope (SEM) and X-ray diffraction (XRD). Computer simulations, using ThermoCalc and Dictra software packages, are then used to create simulated oxidation of the coatings to be verified by the experimental data.
Abstract:

Bismuth telluride (Bi2Te3) is a thermoelectric material occurring in bulk as stacks of five-atom thick sheets. Its properties are most effective when the stacks are exfoliated to yield two-dimensional nanosheets. Previous studies have examined the mechanism of exfoliation and the impact of solvent type on exfoliation effectiveness. This study examines the interactions of those solvents (imidazolium-based ionic liquids) with Bi2Te3 by using molecular dynamics simulations of various liquid drops on a Bi2Te3 surface. The primary attribute measured is the liquid-surface contact angle, which quantifies the interaction strength between the components. These results will help explain the effectiveness of certain solvents in exfoliation, help make predictions regarding different substrates and solvents, and give data to test experimentally to verify accuracy.
Student Presenter: Halle Bannister
Title: Cold Spray Deposition and Corrosion Damage

Abstract:
Not Publishable
Student Presenter: Bradley Beasley  
Title: The Admiralty Foreign Intelligence Committee/Naval Intelligence Department Reports Database

Abstract:

In 1883 the British Admiralty (Navy Department) began systematically to preserve intelligence reports on rivals' navies, coast defenses, etc., and to produce analyses, policy recommendations, and operational plans based on that intelligence. The most important of these documents were preserved in bound volumes which are now housed in the British National Archives (ADM231). During the summer 2016 Dr. Beeler spent a month working in the National Archives, during which he photographed several thousand pages of those reports covering the period 1883-1902 for a book-length project on British naval policy in the late Victorian era. Dr. Beeler has not, however, had time to analyze the material thus gathered in systematic fashion, and I have offered to assist him in doing so. By building a searchable database of the documents.
Abstract:

Caffeine has been found to be toxic to microorganisms, aquatic life, and insects. As pharmaceutical use and coffee production increases, caffeine-rich byproducts are on the rise as well. It is imperative that a way to dispose of caffeine to prevent it from leaching into the environment and damaging ecosystems is found. We have previously observed that the presence of caffeine when growing Escherichia coli BL21 (DE3) cells inhibits the activity β-galactosidase, an enzyme commonly used in molecular biology that is encoded by the lacZ gene. The goal of this research is to determine whether caffeine inhibits enzyme activity or gene expression in the host cell. This will be determined by testing if the expression of the lacZ gene itself is being inhibited by the caffeine or only the activity of the β-galactosidase enzyme. The lacZ gene was cloned into the E. coli expression plasmid pET28a(+) and expressed with an N-terminal hexahistidine tag. After expression, the protein was then purified by Ni-affinity chromatography and tested to determine caffeine's effect on the enzyme's activity. To further confirm results, E. coli BL21 (DE3) was grown without caffeine and cells were then assayed for β-galactosidase activity in the presence of caffeine. Increasing caffeine concentrations in the assay resulted in lower β-galactosidase activity, indicating that caffeine indeed inhibits the enzyme activity. However, the effect is lower than the overall inhibition of the activity in cells growing in the presence of caffeine, which suggests that caffeine may also affect gene expression. Further research on the effect of caffeine has on gene expression is ongoing, and will continue to reveal the mechanism of caffeine inhibition of β-galactosidase activity in E. coli cells.
Abstract:

The ever-changing needs of The University of Alabama's campus directly affect the need for modification in the architecture and planning of campus, but how much did the university's campus plan change due to the admittance of women? This project will be focusing on how the campus landscape was altered after the university was opened to women in 1893 and the years following as women's rights and opportunities changed. Research will be conducted to see the correlation between women being offered more courses, activities, and opportunities on campus and how many new buildings were constructed or renovated to create more space for women's classes and housing. The majority of this research will be done by studying campus maps and planning materials dating back to when the first women were admitted to the university and began taking courses to determine how drastically and at what pace the campus was transformed. The final poster presentation will be a timeline of what buildings were added, remodeled, or demolished during the expansion of the campus for women, along with examples of early campus maps to show the evolution of the university's landscape from the first two women being admitted, to the campus of today where the female student body now outnumbers male students 56% to 44%.
Student Presenter: Adam Benabbou
Title: Application of High Fidelity Simulation Software for Aircraft Mission Simulation and Analysis

Abstract:
The purpose of our research is to develop a platform for simulating and analyzing aircraft systems and missions. We demonstrated that by combining MATLAB with the Systems Tool Kit (STK), a high fidelity simulation software, we could test mission feasibility and system performance under uncertain conditions. The project required a specific final demonstration of STK integrated with MATLAB. In order to test the integrated applications, a scenario was developed where an autonomous ground vehicle is performing a terrestrial exploration in Antarctica. The ground vehicle encounters a malfunction while traversing behind a mountain range, such that the vehicle loses radio telemetry connection with the ground control station at McMurdo Station. To alleviate the loss of connection, a Global Hawk Unmanned Aerial Vehicle (UAV) is deployed in order to locate the ground vehicle and re-establish communication by acting as a bent-pipe signal relay. The Global Hawk is then directed into a long-endurance holding pattern to maintain the signal relay to the ground vehicle. Using MATLAB, an application running STK generated the simulation scenario and produced flight paths resolving the loss of communications while optimizing the flight planning with MATLAB's powerful optimization capabilities.
Session 4: 2:30-4:00 | Arts & Humanities; Engineering
Category 1: Work in Progress
Poster Number: 52

Student Presenter: Sarah Beverly
Title: Chemical Engineering in the United States: A Comprehensive Analysis

Abstract:

Not Publishable
Abstract:

Nanowires and nanoparticles, particularly the ones with controllable shape and size, are of interest for various applications including sensors, electronic devices, and catalysis. Nanostructures have been prepared through two general approaches referred to as "top-down" and "bottom-up". The top-down method cuts the nanowire out of a larger piece of material, while the bottom-up method forms the nanowires through chemical synthesis. The bottom-up approach is superior to the top-bottom approach in its ability to produce nanowires with fewer defects and more homogenous composition. One of the bottom-up methods that has shown great promise recently is template-assisted electrochemical deposition due to its versatility and relative simplicity compared to other methods.

The purpose of this project is to fabricate nickel nanowire structures with controlled shapes and sizes through template-assisted electrochemical deposition to integrate them into usable devices. An example project of this study is finding a way to produce a channel with an inner diameter small enough to allow only a single stand of DNA to pass through. This device would find various applications in fields of genetic research. To produce these channels, nanowires are produced through electrochemical deposition into a silicon membrane and then coated by depositing a dielectric insulator such as silicon nitride onto the surface of the nanowires. After coating, the wires are etched away with an acid solution, leaving channels in the coating material. The current goal of this project is to find a way to separate nanowires from the bundles they form after being removed from the silicon membrane due to the surface tension of the water in which they are suspended, while still allowing access to the nanowires for the etching acid.
Abstract:

Martin Luther's alteration of the Roman Catholic Mass into the Lutheran Gottesdienst (or "God's service") has been critiqued as an afterthought or an act of theological compromise to appease the conservative German princes and peasants. However, Luther's worship rite, especially the ceremonies surrounding the Sacrament of Communion, was crafted to teach and comfort the faithful while also battling heterodoxy. Luther and those in his circle crafted a distinctly "Lutheran" way to celebrate Communion in response to the needs of their congregations, especially with the undereducated peasantry in mind, as a means of explaining complex theological concepts through word and act. Further, they allowed for practices considered unnecessary in order to console the weak in faith or to facilitate the conversion of former Catholics. The early Lutheran Service of the Sacrament was even influenced by the arguments and liturgies of non-Lutherans, such as Zwingli, Karlstadt, Schwenkfeld, and others, as the Lutherans countered other teachings on Communion and even tried purposefully to offend non-Lutherans through their liturgical choices. Thus the liturgy was not intended as a static, repetitive rite as a means to itself, but rather an educational, pastoral, and polemic tool to deliver forgiveness of sins and strengthen the laity in their faith.
Abstract:

Micro-electro-mechanical system, or MEMS, have uses pretty much everywhere in daily life, ranging from sensors and actuators in everyday gadgets to spacecrafts. Among them, many are fabricated with various magnetic materials. The current production process, photolithography, is useful for large-scale production of these MEMS, but is very wasteful when it comes to small-scale production for purposes such as prototyping. 3D printing is a much more efficient process for producing such structures on a smaller scale, and also has the added bonus of being able to create smoother and more complex shapes.

The purpose of this project was to understand the relation between deposition and composition of an FeCo thin film using the process of electrochemical deposition of an iron-cobalt alloy onto a small copper electrode, with the ultimate goal of this project being investigating electrochemical methods to make magnetic 3D structures that can be used in inductors, sensors, and other magnetic MEMS. This was done by using the methods of cyclic voltammetry to first find the current range at which the cobalt-iron alloy was deposited and stripped. Once that range was found, the alloy was deposited over a period of 10 minutes onto the copper electrode, and the thickness and composition of the material were analyzed through x-ray fluorescence. The next steps in this research are to find an inhibitor and accelerator for the deposition, and then to deposit a column of the alloy to test its magnetic properties.
Session 4: 2:30-4:00 | Arts & Humanities; Engineering  
Category 1: Work in Progress  
Poster Number: 77

Student Presenter: Andrew Cooper  
Title: Separation Point Analysis over a Rocket

Abstract:
Flow separation occurs when the surrounding fluid near a surface physically separates from the surface caused by an adverse pressure gradient. In the case of the rocket, the expansion of the plume causes flow separation at the tail end of the rocket.

Flow separation ultimately results in unsteady flow which can cause the rocket to be difficult to control. Furthermore, the separation causes an increase in temperature which could result in the melting of the rocket, and this would create serious complications during flight.

Two important variables that were tested in this study include altitude and Mach number, both of which are known to affect the separation point. The purpose of this research was to determine the speed at which the plume of a rocket causes flow separation at a given altitude and to find the length of the separation region.

This research dealt with a specific case that controlled the Mach number for 1.3 and the altitude for 40,000 feet.

The fluid dynamics software ANSYS Fluent was used to analyze the separation point. This software required creating a geometric model of the rocket and then meshing the flow domain. Also, the initial conditions were specified, which included the Mach number and altitude for the values mentioned above. Then, the solution was iterated until it reached a predetermined interval of convergence.

Upon analysis of the results, flow separation and a recirculation region were observed at the tail end of the rocket using Mach number contours. Also, the temperature at the back end of the rocket reached approximately 3500 K, which is high enough to result in melting.

If more research can be conducted to understand the link between Mach number, altitude, and flow separation, then measures can be taken to reduce the effect of these variables on the separation point.
Abstract:

The complicated history of race relations at The University of Alabama extends back to the campus' earliest years, where like many American universities, enslaved people were present from the beginning. The University owned a small number of slaves, rented the labor of several more people, and allowed enslaved people on campus as the personal property of students, faculty, and even the University president. Enslaved people were integral to the construction, daily operation, and foundation of the University. Located in the Black Belt of Alabama, The University of Alabama was established by the same slave-owning planter class that controlled the economy and politics of the state. In his years as the University's second president (1837-1855), Basil Manly espoused the beliefs of this class, and from his powerful position, he helped elevate the University to a bastion of slavery sympathy. Manly's remarkably detailed diaries relate much about his daily life at the University's helm, including his management of the enslaved workforce and the role of enslaved people on campus. Using Manly's words as a guidepost, this presentation will relate little-known information about slavery at the University, especially including the physical places of enslavement and the role of slaves in the construction and maintenance of the University. This is the first step in a project dedicated to investigating the history of slavery on the Alabama campus from the perspective of an architectural historian.
Abstract:

In existing literature, Glitch art, or art that employs forms of disruption, malfunction, and technical failure, has been described as an inherently critical medium, meaning that it can be used to call into question and critique ideas. However, post-structuralist analytical theories, namely those of Michael Betancourt, have criticized this prevailing assessment of Glitch art by focusing on the problems of the audience-object communicatory relationship. This new assessment makes it difficult for Glitch art to function as a critical piece due to the context of the audience playing a larger role in the shaping of the object's meaning instead of the artist or object itself. Specifically, the "glitch" in Glitch art can be perceived differently or dismissed altogether by the audience unless prepared for it by the context of the audience. The result of this assessment can be viewed as problematic since it gives priority to the context of the audience and the audience itself over the object and the artist in the production of meaning. However, if the audience can interact with the object, the specific form of the object could shape this interaction itself and thus give the artist limited control over the context of the audience-object relationship. Glitch art specifically can provide ample functionality in this regard due to its emphasis on technical features, processes, and data collection, allowing the artist to not only glitch the object itself, but also the technical and interactive relationship between the audience and the object. Moreover, by taking into consideration the immediacy of the context of the audience-object relationship, Glitch art can function critically by taking this context as the subject itself.
Abstract:

This paper examines whether personalist authoritarian rulers in sub-Saharan Africa have been less prone to military coups if they themselves come from a military background, regardless of whether or not they chose to exit the military upon coming into power. This paper seeks to answer this question by examining a dataset of 42 of the longest-ruling and most notorious sub-Saharan African authoritarians and by investigating their propensity to being subject to coups and critical coup attempts.
Abstract:

National traumas can infiltrate the identity of a country and its people, cutting so deeply into the fabric of a nation that even generations who did not personally live through the trauma feel connected to it. The bloody Spanish Civil War of 1936 to 1938, followed by the oppressive dictatorship of Francisco Franco until 1975, left painful scars on Spain’s history. In Argentina, the latest military dictatorship of 1976-1983 wielded violence and state terrorism against its own citizens, and the lasting effects continue to plague Argentinians today. In the wake of these national traumas, cinema provides a creative outlet for remembrance that can be consumed by all as a representation of important history - but how accurate of a representation do viewers receive? Postmemory cinema is used to preserve the memory of an era or event deemed important, but the films go beyond simply retelling history; postmemory allows creative control to infiltrate facts with fictional flair and director bias. Defined as "the relationship that the 'generation after' bears to the personal, collective, and cultural trauma of those who came before," postmemory shows itself in genres such as historical fiction in which creators place their own "imaginative investment, projection, and creation" into the portrayal of historical events. This essay analyzes Spain's Las 13 rosas and Argentina's La historia oficial in order to highlight the ways in which the representation of national trauma in cinema can lead directors to present an historical event with bias and opinion that, if abused, can overload on fiction and skew the facts. Las 13 rosas and La historia oficial depict the dictatorships of Spain and Argentina appropriately - those in power committed unjustifiable human rights abuses against their own peoples, and the directors of these films showcase the evil of these institutions. However, the potential for falsification of facts cannot go unquestioned, especially when a film director intends for an artistic creation to not only represent but also memorialize a national trauma for generations to come. The creative control allowed in postmemory production can exchange historical accuracy for artistic flair, enabling the opinion of a small niche of creators to warp an entire population’s remembrance in wake of trauma.
Abstract:

Bioimpedance measures resistance to the flow of an externally applied electric current through biological tissue and has been used to quantify the physiological changes in muscle tissue during maximum voluntary contractions and fatigue. The ability to monitor muscle tissue and performance has clinical and sports industry related applications. While changes in impedance have been investigated during maximum voluntary contractions (MVC), there has been little exploration into the response of muscles during smaller movements. If monitoring muscle injury or rehabilitation, the MVC is not the desired response therefore a better understanding of the impedance during lesser contractions is necessary. It is important to determine if muscles can be targeted with electrode configurations and specific movements designed to engage said muscle and if a distinct quantifiable response is produced. This study measured the electrical impedance of the human forearm in three different tetra-polar electrode configurations and during five different wrist flexion positions as well as a relaxed state. The positions were chosen in an attempt to elicit a response from superficial muscle groups that could be targeted with appropriate electrode configuration. Impedance measurements were taken during wrist abduction and adduction, while making a tensed fist, during both wrist abduction and adduction while making a tensed fist, and in a relaxed state. Electrodes were placed along the length of the muscle being targeted. The first electrode configuration targeted the extensor carpi radialis longus and brevis on the posterior forearm and the flexor carpi radialis on the anterior forearm. The second configuration ran down the middle of the anterior forearm catching the response from the flexor digitorum superficialis and the flexor digitorum profundus in the middle and deep layer respectively and that of the flexor carpi radialis, flexor carpi ulnaris and palmaris longus in the superficial layer. The third configuration targeted the flexor carpi ulnaris on the anterior forearm and the extensor carpi ulnaris on the posterior forearm. Impedance measurements were taken on a single day from one participant using a Keysight E4990A and frequency range of 5 kHz to 1 MHz. All five movements were repeated at each electrode configuration and the responses were compared. The data was analyzed by examining the response at four frequencies, 10 kHz, 50 kHz, 100 kHz and 500 kHz. This allowed for finite comparison across a wide range of frequencies. The second electrode configuration saw the greatest percent change in resistance from the relaxed stated at 17.70% at a frequency of 10 kHz during the wrist adduction with a tensed fist. The greatest percent change in the reactance was in electrode configuration 3 during the wrist adduction with a tensed fist with a value of 52.73% at 10 kHz. The movements involving a tensed fist consistently produced a greater response than those without. The change in resistance ranged from 1.08%-10.66% in the first configuration, 1.12%-17.70% in the second, and -0.49%-16.95% in the third electrode configuration. The change in reactance ranged from 3.90%-21.55% in the first electrode configuration, 0.32%-52.73%. in the second and -1.99%-52.73% in the third configuration.
Abstract:

During the Fall 2017 semester I was the costume designer for The University of Alabama Theatre and Dance Department's production fully titled "We Are Proud to Present a Presentation About the Herero of Namibia, Formerly Known as Southwest Africa, From the German Sudwestafrika, Between the Years 1884-1915."

This show tells of a group of young actors who come together to present the story of the Herero people, African tribespeople nearly eradicated by German forces prior to World War I. However, personal views conflict in how the story of the Herero should be told and quickly escalates; tensions grow between the members and demonstrate the divisive perspectives of the young Americans. It focuses on the current and consistent subtleties of racial bias and prejudice seen in this generation that have persisted with time. The group of actors quickly falls into their categories of "white" versus "black" and lose sight of their original purpose. Their reasoning is cast out, as individuals devolve to hate, and eventually turn to violence in a scene that mirrors the horrors of "separate but equal" and a racist South.

To tailor this raw experience to the audience, director Elizabeth Kirkland and I set out to make these characters look as though they were students here at the university. Through our collaboration process, we aimed to make this show personal. Each character in the show comes from a different social and economic background and represents an argumentative voice heard within today's society. We wanted all characters to have a moment of sympathy, a chance where everyone could listen, despite any political beliefs, as this show emphasizes the importance of acceptance and compromise.

When designing the costumes, I created individual looks, using the characters' clothing to denote personality and give insight to their lifestyle. I pulled inspiration from images of the Herero people and their brightly colored outfits to incorporate into the characters. The vibrancy in color aided in communicating their emotional state as well as further representing their arguments and the power they hold over people. By layering their costumes too, the outfits allowed for a natural progression of "undressing" in visually showing a heightened state of agitation in the action of the play.
Session 4: 2:30-4:00 | Arts & Humanities; Engineering
Category 1: Work in Progress
Poster Number: 57

Student Presenter: Tim Foley
Title: Updating and Integrating a User Interface for the ILLISLAB Pavement Analysis Software

Abstract:
This project endeavors to make improvements upon existing concrete pavement analysis tools, specifically the ILLISLAB finite element software. First developed in 1979, ILLISLAB analyzes the effects of loads and stresses on a system of concrete slabs. The ILLISLAB input and output systems are not intuitive to the modern PC user and data output is difficult to interpret. Moreover, comparable contemporary software packages are exceedingly expensive, limiting their availability to educational institutions.

This project greatly simplifies the input and output process, making it faster and easier for the user to operate. Data output visualization has also been added to streamline analysis of slab behavior.

This project contains code in the FORTRAN, C#, and MATLAB languages. Fortran code was edited in Microsoft Visual Studio and compiled with the GFortran compiler. C# components were also created and compiled using Visual Studio. MATLAB code was developed using MATLAB version r2017b. Compatibility and communication between these different languages is facilitated by Microsoft's .NET framework.

ILLISLAB is written in the FORTRAN programming language and predates the era of personal computers. As such, there is no method for inputting data directly from a Windows application into the software. ILLIGUI, developed by Dr. Amirkhanian, processes user input generates the lengthy text input files required for input into ILLISLAB. This project expands the functionality of ILLIGUI, integrating data input, processing, and output into one process. Output files are now parsed and analyzed using MATLAB’s suite of data processing and plotting tools. Relevant data is combined into a variety of data structures to generate heatmaps, graphs, and 3D mesh visualizations. These improvements greatly enhance the software’s usability and open the door to educational use.
Abstract:

There are few places in the world where nonhuman primates (NHPs) do not interact regularly with humans. Even with an absence of native NHPs in North America, sanctuaries, zoos, and labs are frequent areas of sympatry (i.e., species overlap). Within each of these settings, primate caregivers develop some degree of relationship with the NHP residents. Previous research suggests that zoo professionals form bonds with their animals, and the most frequent bonds reported were with primates. This study looks at primate caregivers' perspectives on their relationships with NHPs. We hypothesized that type of facility predicts how caregivers view their personal human-NHP relationships with regard to the importance, strength, complexity, and reciprocity of the relationships. We predicted that (1) zoo and sanctuary caregivers have higher agreement in these aspects because of low numbers of NHPs cared for, as well as consistent and long-term interactions and (2) lab caregivers have lower agreement in these aspects because of higher number of NHPs cared for and inconsistent interactions. To conduct this study, we administered an online questionnaire in which sanctuary, zoo, and lab primate caregivers (n=76) answered detailed questions about their demographics and job, as well as agreement statements about their personal human-NHP relationships. Our results show that zoo and sanctuary caregivers tend to view their relationships as more important, stronger, more complex, and having higher reciprocity than lab caregivers, which supports our hypotheses. There are also other variables influencing this view among all facility caregivers, including job duration, total primates cared for, and time spent interacting. Almost all participants agreed that their relationships with their primates has a positive influence on their well-being and positively influences their job satisfaction. This data suggests that the human-NHP relationship may be a factor influencing caregiver well-being. Similar inferences can be made for NHP well-being but needs to be further studied.
Session 4: 2:30-4:00 | Arts & Humanities; Engineering
Category 2: Completed Work
Poster Number: 27

Student Presenter: Abigail Furman
Title: Great, Awesome, Terrific, and Fantastic: Analyzing the Lexical Semantic Change of a Set of Near Synonyms using Corpora

Abstract:
The focus of this research is on the cultural and semantic change over time for the near-synonymous words great, awesome, terrific, and fantastic, looking specifically at the convergence from relatively varied senses to simply meaning "very good." Most of the research on groups of near-synonyms tends to focus only on the differences in meaning between each word, and much of the research surrounding lexical semantic change only concerns the shift in meaning of words individually. This paper seeks to not only study a set of near-synonyms but also to track the lexical semantic change of each word over time, with the goal of showing that each word's previous meanings were much more distinct and that the set has become more homogeneous over time. Broadly speaking, how have the words great, awesome, terrific, and fantastic changed in meaning over time?

To study the change over time for this set of near-synonyms, there are a number of factors to take into account. The field of semantic change itself is rather complex and research in the field can be subjective, but people can search corpora to find words' contexts and common collocates over time. In addition, dictionaries like the Oxford English Dictionary have a wealth of information about different definitions of polysemic words throughout history as well as their etymologies. To study the semantic change of these words, after taking existing research into account, I performed searches in corpora such as the Corpus of Historical American English and analyzed notable noun collocates for each adjective in said corpus; I then checked my findings by referring to each word's historical information and listed definitions in the Oxford English Dictionary. By doing this, the semantic change of each word and its uses throughout history can be described.

The results of the study show that each of these words are near-synonyms for each other in today's world, but they all have distinct prior meanings that have faded. Great had a similar meaning to grand and important; awesome meant awe-inspiring; terrific was closer to terrifying and horrific; and fantastic had implications of fantasy and imagination. The group of near-synonyms studied are polysemic and have undergone semantic change over the course of their lives. At the present time, the four words are as closely linked semantically as they have ever been, with a common definition of good.
Abstract:

On January 9 2018, Montecito CA experienced 30 square miles of a catastrophic debris flow/mudslide destroying over 400 homes, and taking over 20 lives. With new advances in technology, including social media and warning mobile apps, disaster warning information can be disseminated more than ever before. Using a mixed methods explanatory sequential research design, this study is assessing the warning process in alerting California citizens of the Montecito debris flow/mudslide. The study gathers both qualitative and quantitative information, informing weather-messaging systems on the role mobile apps, and other notification systems play in alerting its citizens of impending natural disasters. Potential implications formed from this study may improve the weather-warning process for mudslides and other flash flood events. The miscommunication between the citizens and the weather-warning process is in need of improvement, and this study will improve such systems. This presentation will focus on preliminary data from the California Mudslide 2018 Weather Warning Assessment.
Abstract:

Internal combustion engine efficiency can be increased by raising the volumetric compression ratio, which is calculated by dividing the volume in the cylinder when the piston is at its lowest point (known as bottom dead-center (BDC), which results in the maximum cylinder volume) by the volume when it is at its highest point (known as top dead center (TDC), which results in the minimum volume). The engine size, or displacement volume, is determined by the difference between the maximum and minimum volume. For a given displacement volume, increasing the compression ratio necessitates reducing the volume at TDC. This can be done by reducing the volume in the cylinder head combustion chamber or adding a dome to the piston. The latter is required when major changes to the engine design are not possible. In this work, a high compression piston for a pre-existing engine using direct fuel injection is being designed and will be evaluated for use in an alternative fuel engine. This design features all specifications required to be compatible with the preexisting engine with the addition of the aforementioned dome. This part is being designed using Siemens NX and is being used for research regarding the results of the high compression direct injection combustion strategy, the plausibility of 3D printed pistons using an additive friction stir solid-based printer, and the capability of a magnesium alloy to serve as the primary material for the piston. This project is part of the efforts of the University of Alabama EcoCar Innovation Team.
Abstract:
Throughout the late-nineteenth and early-twentieth century, millions of Europeans filled crowded ports and embarked upon a journey to a new world. Men, women, and children hauled trunks filled with their belongings to steamships that would grant them passage to a new life in the United States. From 1825 to 1928, approximately 850,000 Norwegians emigrated to the United States in search of land, employment, and economic opportunity. In 1906, a young woman by the name of Mary C. Havig (b.1891-1977) traveled to the United States from her home country of Norway, accompanied by her mother, grandmother, and two younger sisters. Mary brought a large painted wooden trunk with her on this voyage, filled with items that she and the family would need upon their arrival. The trunk she brought, created in 1738, features fine examples of Norwegian folk painting, wood joining, and metalwork. Trunks like this, now referred to as the Hallquist trunk, were considered valuable family heirlooms and were traditionally handed down over generations. They have a long history of importance in Norwegian culture and played key roles in marriage dowries, wedding traditions, and indigenous art movements throughout the course of several hundred years. Although the history of Norwegian folk art and painting has been addressed by a number of scholars, the specific role of the trunk in Norwegian and Norwegian-American folk art and culture has yet to be the focus of an independent study. This project aims to fill this gap in scholarship through research into their use over time in both Norway and America. This presentation traces the history and significance of painted trunks in both Norway and America through the specific study of the Hallquist trunk, whose history has, over the past 279 years, narrated the story of both a significant folk painting movement in Norway, as well as a single Norwegian family’s immigration to the United States.
Abstract:
The project aimed to increase the 3D printing capability of the Alabama Innovation and Mentorship of Entrepreneurs (AIME) prototyping lab. 3D Printing is constrained by certain aspects of the printer itself. The build volume, print speed, print quality, and types of materials a given printer can use are all determined by hardware. Similarly, the capabilities of the AIME prototyping lab were constrained by the lack of machines, size of machines, resolution of available machines and the variety of materials the machines can print. The lab's capabilities drastically impede quality, lead time, price, reputation and client retention. The team identified ways to address each constraint through a 3D printing design project. The constraint presented by build size creates a two-fold issue. A small build volume requires large single part projects to be broken into multi part designs. This increases the overall number of prints required to complete the project, adds extra finishing work to ensure quality, and sometimes causes AIME to be unable to meet a client's request. Increasing total build volume, then, could decrease print time, increase quality, and increase customer satisfaction. Material, speed, and quality constraints are also directly created by the machine’s hardware. Creating a printer with individual pieces of hardware aimed at decreasing specific restraints could result in greater capability. The team’s solution to increasing lab capability involved two steps. First, a broken 3D Printer, a CubeX Duo, was retrofitted with entirely new hardware taken from a Folger Tech FT-5 build kit. Then, using only the I-Rails and drive screws from the FT-5 kit, a novel printer was constructed using a combination of hardware components intended to increase capability of the printer. The first step increased the total build volume available at AIME; thus, decreasing build time and increasing the number of projects the lab can handle at a given time. The second step addressed single-project speed, material capability, and print quality. The results were analyzed on both a quantitative and qualitative basis. Single print speed and total project duration were assessed by comparing durations from before and after the implementation of the new printers. Print quality was assessed by comparing the number of imperfections on prints using the new printer to the number of imperfections in prints using the old printer. Material capability was assessed by attempting to print new materials that the old printer was incapable of printing (due to the nature of this assessment any successful build not made of standard ABS or PLA filament yields a positive result). Total build volume and single-print build volume were assessed by a simple comparison of values from the previous lab to the lab created. Upon completion of the project, it seems that all goals were successfully accomplished.
Abstract:

Before its unification in 1871, Germany was a loose confederation of self-governing territories. The unification of 1871, led by Prussia, one of Germany's largest states, finally forged these heterogeneous territories into a singular political entity. My senior honors thesis for the History Department, a paper entitled "Nationalist Sentiment in the Era of German Unification," analyzes the dissemination of nationalist expressions in Germany from a small but influential class of bourgeois intellectuals and artists to broader populations at the time of unification in the early 1870s. With support from two University of Alabama Research Scholarships, I conducted research with German and French documents over the course of two months at the Staatsbibliothek zu Berlin, one of Europe's largest libraries.

The project examines why German nationalists in the 1870s disseminated their narratives, the characteristics of these views, and how these messages might have reached citizens beyond the bourgeoisie. I argue that in response to certain intellectuals' critiques and doubts of the new Prussian-dominated Reich, nationalists strove to propagate patriotic mythology in the forms of new German identity and founding legends through a variety of means to as broad a population base as possible. I have utilized published poems, newspaper articles, memoirs, history texts, images, songs, and monuments of the era in making my argument. Current scholarship focuses on the fact that these ideas were generated by a small segment of the population but leaves room for exploration as to where and how these ideas traveled. My argument builds upon current scholarly conversation in its recognition that although these nationalists messages were generated by few, they had the potential to impact broad swaths of the German population's collective consciousness.
Student Presenter: Kyle Hornbuckle
Title: Dependence of Bioimpedance Measurements on Phantom Surface Temperature

Abstract:

Purpose: Bioimpedance commonly refers to a biological tissue's opposition to an applied electrical stimulus. It is commonly utilized to determine body composition but has various other healthcare applications. Testing instruments for collecting bioimpedance data is challenging because different tissues have different electrical properties which are not known before their measurement. This makes using tissues as a measurement standard extremely challenging. Also, external factors such as movement, temperature, electrode placement, etc. can impact measurements. Some of these factors can be minimized by the application of phantoms. An electrical impedance phantom is an artificial model created to mimic the impedance characteristics of a tissue. Under consistent conditions, phantoms theoretically retain the same properties and can be tested for extended time periods, enabling accurate results for benchmark testing.

Methods: In this experiment, the effects of temperature on the electrical impedance of a gelatin phantom were quantified. The phantom consisted of 20 grams of Great Lakes Unflavored Gelatin and 400 mL of water. This gelatin was characterized using a Keysight E4990A impedance analyzer connected to the material using surface Ag/AgCl and a 16089D alligator clip interface. The electrodes were placed in linear configuration on the phantom with leads measuring voltage on the inside and leads responsible for delivering the excitation current on the outside. An excitation current of 1 mA was applied to collect 201 data point measurements from 1 kHz to 1 MHz at five minute intervals over 80 minutes after the phantom was placed at room temperature after being initially stored at 8.5°C.

Results: From the collected data, both real and imaginary impedance components varied with temperature. With the resistance showing greater variation at low frequencies and the reactance showing greater variation at high frequencies. As the temperature of the gelatin began to stabilize around room temperature, each measurement became more consistent compared to the previous measurement. Both the resistance and reactance showed a greater variation from their measured values at 1 kHz to their measured values at 1 MHz as temperature decreased. At 1 kHz, the resistance decreased from 256 Ω to 200 Ω while the reactance was consistently -0.2 Ω. At 1 MHz, the resistance was consistent at approximately 172 Ω while the reactance varied from -131 Ω to -73 Ω.

Conclusion: This experiment highlights the temperature dependence of a gelatin, which should be controlled to reduce impedance fluctuations during testing. Fluctuations ranging as large as 52 Ω were noted in the initial measurements which are believed to have been attributed to rapidly changing temperatures of the gelatin.
Abstract:

"In creating my senior collection titled, "grace." I demonstrated my style aesthetic which is dominated by feminine flare and stylistic elements from the past. My collection is influenced by vintage elements from the twenties and thirties, the Art Deco Movement, and how these elements work to construct femininity. "Grace." is comprised of five looks that include: a mid-calf, deep back chiffon dress, a brocade two-piece shorts set with lace up back detail, a brocade drop-waist dress with chiffon skirt, a corseted fit and flare dress with lace up back detail, and a hot pink princess seam two-piece. The fabric selected for the creation of "grace." was significant to my concept and inspiration with fabric playing a large role in the development of my collection. With the use of detailed brocades symbolizing the Art Deco Movement, floral chiffons expressing femininity, and bright silks it was important that my fabric brought to life the aesthetic of my collection. Stylistic elements such as drop waists, flowy sleeves, deep-V backs, and lace-up closures are depictive of the 1920's-30's and are expressed in the garment construction of my senior collection. The target customer for the collection is someone that embodies a nostalgia for vintage clothes while having a lifestyle that allows them to dress up often, mainly targeted to 20-30 age group. The formation of my collection was approximately a three-month process where I was responsible for forming my creative concept, designing and composing my own patterns, and finally constructing my garments by hand and machine. The process was very time consuming but well worth the final product. In all, I find it important for women to feel both beautiful and powerful, and I hope my designs and my collection, "grace." will help women to do so.
Abstract:

Limitations on wind load analysis have resulted in a limited understanding of building performance due to extreme wind events. Performance-based wind engineering needs to consider the non-linear interactions between wind and structures in extreme wind events, including the change in wind load under the change of building conditions. This project aims to study the effects of sudden failure of building envelope, doors, or windows to the internal pressure in residential buildings. By observing the effects of high wind loads causing component failure on a building prototype, the results can be extrapolated to the full-scale model and provide the insight necessary to consider the non-linear interactions of wind and building components. Using AutoCAD and 3D printing, a realistic prototype can be printed and installed in a wind-tunnel for testing. Pressure taps monitor the changes in internal and external pressure, and a simulated garage door provides the point of failure for study. This allows for structure component failure under high wind pressures to be studied and the changes in pressures to be analyzed.
Abstract:

Radiolocation, which is the process of identifying the location of transmitters through wireless signals, is commonly used in emergency tracking, cellular telephony, and real-time location systems (RTLS). Many radiolocation techniques use multiple receivers to determine a transmitter's location, such as the trilateration technique used in cellular telephony. However, a portable single-receiver radiolocation system is needed in applications like Search and Rescue, where portability and versatility are required. One solution is the Pseudo-Doppler Antenna Array (PDAA), which is a system that switches between antenna elements in a circular pattern at a high speed in order to act like the rotation of a single antenna. The rotation generates a Doppler shift in the received signal, which is measured to determine the location of the transmitter. However, like many single receiver radiolocation systems, the accuracy of the PDAA is decreased by multipath effect. To address these issues, we applied polarization diversity to the PDAA, therefore improving channel capacity and mitigating multipath effects and polarization mismatch. The designed dual-polarization antenna was characterized using a Vector Network Analyzer (VNA: Agilent N5320A) and Anechoic Chamber (Raymond EMC QuietBox AVS 700). The measured results show good port isolation and omnidirectional radiation patterns. Additionally, to create a portable and versatile radio receiver for the system, we utilized software-defined radio (SDR). By using a HackRF device and GNU software, we have created an SDR receiver capable of monitoring the constellation plots, frequency domain graphs, and time domain graphs of the channel. To conclude, the designed system utilizes a PDAA and SDR receiver to recover the original transmitted signal and determine the location of a transmitter while maintaining portability.
Session 4: 2:30-4:00 | Arts & Humanities; Engineering
Category 1: Work in Progress
Poster Number: 47

Student Presenter: Triston Jones
Title: Glycerol as a Source of Green Solvents for CO2 Capture

Abstract:
Propane-1,2,3-triol, or glycerol, has recently been found to be able to form derivatives such as 1,2,3-Trimethoxypropane, 1,2,3-Triethoxypropane and certain fluorine containing molecules. Early reports of these derivatives show that they may represent a "green" and nontoxic alternative to currently utilized CO2 solvents, such as diglyme. However, since successful synthesis of these glycerol derivatives has only recently been reported, many of the derivatives' thermophysical properties have yet to be reported. Furthermore, the structure of some of the derivatives is analogous to polyether solvents used in the Selexol process for removal of CO2 and other "acid" gases from CH4, H2, etc. With this, examining the solubility of CO2 in these derivatives is also of interest. This research seeks to characterize these glycerol derivatives as a physical solvent for CO2 absorption, as well as record their densities, viscosities, and vapor pressures with respect to temperature. Due to their favorable properties, glycerol-derived triethers warrant a greater consideration as new physical CO2 solvents and functioning in other gas treating situations.
Abstract:

Not Publishable
Student Presenter: W. Colton Knight, Claire - Wen Walsh
Title: Reducing Thermoacoustic Oscillations in LDI Combustors

Abstract:

Lean Direct Injection (LDI) is a form of combustion that is revolutionizing the jet engine industry by its ability to emit a smaller carbon footprint as well as increase fuel efficiency. In an LDI combustor, liquid fuel is supplied directly downstream into the combustion section where it will undergo vaporization, mixing, and burning simultaneously. A major concern with the LDI combustion processes is the presence of thermoacoustic oscillations that occur largely during lean operation. These oscillations occur due to turbulent corner recirculation interacting with the flame and causing fluctuations in heat release rate. Inserting a porous medium into the combustion chamber can alter the flow field and thus hinder the formation of thermoacoustic instabilities. We will be exploring different materials and additive manufacturing processes to create the porous insert. The additive manufacturing process will give us more geometric design freedoms as well as allow us to make prototypes to test different designs to produce the best results.
Abstract:
The Forget-Me-Not collection is focused around clean lines, unique details, and machine embroidery. This collection is inspired by nature, as seen in the colors and embroidery on various pieces. The fabrics used include silk chiffon, silk jacquard and cotton twills. This collection is designed for women in their 20’s that like to keep up with current trends.
Abstract:

Ionic liquids (ILs) are organic salts with a melting point below 100 °C. They are a relatively modern technology that have seen a significant increase in scientific interest since the 1990s that cover a wide variety of chemical process applications, including production of plastics, recycling of metals, and processing of cellulose. Their industrial appeal is based largely on reduction of environmental effects due to their low volatility, which nearly eliminates concerns for atmospheric release. However, the commercial use of ILs poses a concern for biological safety considering the potential of interaction of organisms with ionic liquids used in materials or found in pollution streams that can result in ecological or human exposure. This study investigates the toxic effects of various ILs on Chinese Hamster Ovary (CHO) cells, a common mammalian cell line used to model mammalian conditions. The purpose of this study is to expand upon a toxicity database for industries seeking application of ILs to subsequently mitigate the risk of adverse biological effects. Range finding studies were developed to ascertain the lethal concentrations of the ILs needed to kill 50% of a cell population exposed to each IL (LC50 values). This toxicology parameter is a standard marker for evaluating the relative toxicity of different and will provide guidance for selection of ionic liquids that are both useful and minimally toxic for further development.
Abstract:
In the mid-1960s, the Chinese Cultural Revolution brought about massive educational changes for students at all age levels. This movement, which is known as the "Educational Revolution," was marked by the heavy revision of textbooks. In previous years, textbooks had concentrated on teaching fundamental scientific principles with little attention paid to political slogans and indoctrination. The textbooks that accompanied the Educational Revolution provided students with pragmatic and military-related knowledge. Mao's quotations and political slogans permeated these books, which were characterized by anti-bourgeoisie, anti-capitalist, anti-Soviet, and nationalist ideologies. Why high school textbooks underwent such changes during the early 1970s? What did this transformation look like for ordinary high school who were suddenly directed to learn practical skills and political propaganda instead of the curricula that their predecessors had studied?

This research studies this transition of textbooks used before and during the Educational Revolution and ties the transition to the background of the Cold War. This paper argues that Chinese high school educators and policy makers sought to teach practical skills--such as industrial, agricultural, and military skills--and political propaganda, in order to prepare them for their perceived impending conflict, and to help Mao's ideal of socialism and to eliminate the influence of his political enemies. This study compares Knowledge of Industry textbooks used during the Educational Revolution with a physics textbook that was used before the Educational Revolution, and also examines Mao's speeches, letters, governmental announcements, and newspapers from the 1950s to the 1960s.
Student Presenter: Annemarie Lisko
Title: Representations of Memory in Percy Shelley's Italian-Period Poetry

Abstract:

Not Publishable
Abstract:

The goals of my project are to showcase my experience as a member of the most competitive diving team in the world. The five years I spent on that team, from age ten to age fifteen, showed me a world of different perspectives in a foreign land. The opportunity allowed me to not only to learn the official language and cultural mores in China, but to experience how the political structures operate and some of the consequences that individuals face in the Republic's athletic programs. Because of the intimate nature of my experience, I am using personal field diaries, naturalistic observations, memories, and unstructured interviews from former teammates for more perspectives. Through research, my auto-ethnography explores the friendships and power dynamics in the system, alongside the complicated nature of growing up in a strict team environment instead of with family. It depicts a system that is notorious for producing numerous Olympic 'disposable empty champions'. They are 'disposable' because despite their accomplishments, even on an Olympic scale, there are many prodigies of the same level desperately waiting to replace them. They are also 'empty' because education is deprioritized and emotional connections are banned. In time, this information will be included in a book that I am working on, titled Grey and White Platforms. Shedding light on this experience is valuable for a number of reasons. First, it defines a system that is invisible, even to non-athletic outsiders living in the same nation. But most importantly, it will also depict a world where imperfect social conditions have the potential to lead to both the worst nightmares and deepest friendships.
Student Presenter: Christina Lu
Title: Little Children in My Heart: Examining the Many Meanings of Personal "Growth" in Beijing, China

Abstract:
This poster focuses on the ways in which individuals who are active in contemporary psychotherapeutic workshops at a Beijing "mind-body-spirit center" come to understand the meaning of personal "growth" (chengzhang). This center exists as part of the burgeoning psychological industry in contemporary China (Kleinman et al. 2011, Huang 2014, Kuan 2015, Zhang 2017) and includes workshops on developing one's "inner child" (Pritzker 2016), resolving long-standing energetic blockages in the inherited family system (Duncan 2015, Pritzker 2017), or connecting with one's "higher self." Based on participant observation, interviews, and focused qualitative analysis collected over three years, the poster examines how individuals variably draw upon the term chengzhang to describe both their experience in the community as well as their goals with regards to continued participation. Generally speaking, individuals who attend the workshops are seeking deeper meaning in life, more extensive self-understanding, increased financial success, and/or improved relationships with children, spouses, and friends—all of which are seen to be evidence of personal development or maturity (chengzhang). When they speak about growth, participants thus refer consistently to themes of spirituality, self-acceptance or confidence, parenting, romance, family relationships, and emotion management. After a brief background section, this poster provides direct quotes related to these themes, derived from participant interviews and introductory remarks shared at various workshops. We then discuss the ways in which the examples demonstrate two main things: (1) the diversity and multiplicity in ways of defining chengzhang for various individuals, and (2) The ways in which chengzhang comes to mean very different things for people depending on where they are in their individual "journey" in the personal growth community. Together, these results suggest that when we as scholars seek to understand a "cultural idiom" (Kirmayer 2013) such as chengzhang, a close ethnographic inquiry into the meaning-making of individuals....
Session 4: 2:30-4:00 | Arts & Humanities; Engineering
Category 1: Work in Progress
Poster Number: 43

Student Presenter: Annsley Mace, Melisa Montalvo
Title: Production of Three-Dimensional Porous Graphene for Energy Storage

Abstract:

Not Publishable
Student Presenter: Alexandra Mannings, Alexia Acebo
Title: Mixed Reality: A Dual Exploration

Abstract:
Mixed Reality is an exploration of the nature of dance-making and performance, led by Creative Campus Fellows Alexia Acebo and Alexandra Mannings. Through employing virtual reality technology and immersion into the dance performance, the research duo seeks to highlight the differences between live and recorded performance in 360 degrees. The project presents a series of modules that explore different movement and spatial ideas as well as a non-traditional relationship between performer and audience. The ultimate questions of Mixed Reality revolve around the different methods of immersion and how they change the experience of creation and reception.
Student Presenter: Jacob Martin
Title: Observe and Control: The Surveillant Gaze in Contemporary Spanish Cinema

Abstract:

The modern history of Spain presents a peculiar case for the study of the role of surveillance in society. From the Franco regime (the fascist dictatorship that controlled Spain from 1939-1975) to the current democracy, some form of disciplinary observation has played a role in all of Spanish society, be it politics, prison, or school. Technological innovation at the end of the twentieth century allowed a massive expansion of digital monitoring worldwide, and although Spain has been slower to adopt measures of video and electronic supervision, it is now a participant in a system of global surveillance.

For the last 50 years, academic study of the history and effects of surveillance has emerged across disciplines, with the majority being concentrated in the social sciences. With the proliferation of digital monitoring technologies, a surge of surveillance narratives has influenced modern culture as well as works of fiction, especially in film and television. While a rich literature commenting on the role of surveillant narration in (mostly American) films has begun to develop, there is little that analyzes it in Spanish cinema.

Drawing from the theoretical framework developed by Michel Foucault analyzing and critiquing the role of observation and disciplinary techniques in society, I analyze two contemporary Spanish films, Tesis (1996) and Celda 211 (2009), and provide an account of the role of the surveillant gaze in their narratives, as well as the representation of disciplinary mechanisms through cinematic techniques. Furthermore, I give historical context to the films using empirical data by recounting the emergence of CCTV (remote video cameras in public places) and the public debate concerning it in Spain, and I posit that the films serve as social commentaries about the expanding role of digital vigilance in both Spain and the entire world.

While this project is largely focused on the analysis of film and culture in Spain, it is of special relevance to the culture of the United States. Following the attacks of September 11th, the role of digital monitoring has expanded into everyday life, and accelerating technological advancement has allowed for a more complex and ubiquitous system of observation to be put in place by both public and private entities. The world is now at a unique moment in time in which the classical mechanisms of control and supervision are being realized at an unprecedented scale. Cinema, be it Spanish or American, serves as a cultural diary of its impact.
Category 2: Completed Work
Poster Number: 80

Student Presenter: Nate McCoun, Abram Aguilar
Title: Remote Sensing of Earth, Moon, and Mars: Investigating Orbits and Constellation of CubeSats

Abstract:

The research project focuses on exploring the orbital parameters for a satellite or a constellation of satellites that best cover a desired area by employing commercially available astrodynamics software. The topics explored in this project vary from investigating spacecraft trajectories for cloud coverage, the U.S. Gulf coast, and the icy poles on Mars. Given the desired target area that requires adequate coverage for science investigation, suitable orbits are found and run through numerous simulations. After running a large number of iterations, a suitable solution with specific orbital parameters for the satellite/constellation of satellites are established that meet the maximum mission requirements. Through this process, an arbitrary area on Earth, Moon, Mars, or any celestial body can be investigated and evaluated by designing a set of orbital parameters that best describes the type of orbit configuration required to meet the science goals.
Abstract:
This research project looks at the ongoing impact of colonization on native communities in the United States, specifically through the lens of climate change. The evolution of colonization has spanned from invasion and occupation to violent involuntary removal after the creation of reservations, to forced migration because of toxic mining or waste. By coercing native people off of their lands, the US is committing an environmental injustice that has been perpetuated for hundreds of years. Colonized environmental racism against Native Americans has resulted in native groups becoming the United States' first internal climate change refugees. This project looks into several examples of native communities that have already been forced to migrate, or will be forced to in the near future, because of climate change.

Native communities leaving their lands because of environmental problems, specifically those relating to climate change, is a continued consequence of colonization. It is the United States and other major international powers in the world who contribute most to carbon and other emissions and thereby climate change. These are the same powers who colonized most of the world. Yet, it is often the colonized and globally oppressed who face the consequences. Those most affected today are groups like small Pacific Island communities being forced to abandon their country in search of new homes and Native Americans who must uproot their cultures to find safety.

This research project looks to examine not only the connection between indigenous communities in the U.S. and the disproportionate impact the changing climate has on those communities, but also how colonization and climate change has directly disrupted native ties to the land. This project also attempts to review how the U.S. federal government has responded to these issues and the potential to change and improve on those responses.
Session 4: 2:30-4:00 | Arts & Humanities; Engineering
Category 2: Completed Work
Poster Number: 72

Student Presenter: Sydney Morales
Title: Relationship between mechanical properties and microstructures of high pressure die casting AA383 alloy

Abstract:

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Abstract:

Graphic design is one of the most subtly influential facets of everyday life. From the book jackets we pick up to the instructions on the side of our pill bottles to the textbooks we pour over, every piece of print and digital media has some sort of connection to graphic design, be it a carefully analyzed or a careless one.

In the same way that graphic design can take many forms, its major characters and players differ enormously. Over time, software developments have slowly democratized the potential to learn and practice graphic design. Consider the example of the printing press: prior to the 1450s, graphic design was a small field, as a small group of people created print materials either through simple transcription or with the aid of rudimentary stamps. These products still showed clear evidence of design—the incorporation of columns demonstrates thought about maximizing spatial efficiency and decorative margins both increase the aesthetic beauty of the product and reinforce and represent the content of any given page ("Books Before Gutenberg"). However, Gutenberg’s printing press simplified the logistical aspects of transcribing text to the point where printmakers had the luxury of devoting more energy to covers, bindings, and the print design of each individual page. Suddenly, individuals both could afford carefully designed items, and some could purchase the technology to create as well. This trend has continued ever since as new technologies (examples include the steam powered press, the web press, and the Xerox machine) boost the availability of graphic design production and products (Novin). The invention of the computer expedited this process enormously, not only ushering in the webpage as a critical medium for graphic design, but also paid software like the Adobe Creative Suite and eventually the free online programs like Pixlr, Canva, and PiktoChart that creates space for the production of graphic design at a price range available to all.

Just as the group of people able to create graphic design has enlarged, so too have the people influenced and affected by it. Though individuals consuming high amounts of media will be most exposed, everything from bathroom signs to flags to SNAP applications represent forms of graphic design. All of this content intersects with several facets of modern life, but as this essay continues, it will specifically examine how graphic design impacts social change. How does the look of official documents like tax returns and ballots impact their use and understanding? How does this negatively affect low income people? Where has graphic design moved people to promote change? What does a future filled with motivated and dedicated graphic designers look like?
Student Presenter: Dennis Parnell Jr.
Title: Demonstrating a direct-injection constant-volume combustion chamber as a validation tool for chemical kinetic modeling of liquid fuels

Abstract:
Development of chemical kinetic models for combustion depends heavily on the ability to provide experimental data at conditions that are easily simulated on the computer. For most cases this means a zero-dimensional model with no mixing captured (i.e. the entire volume is perfectly mixed fuel and air). For heavy liquid fuels (i.e. not propane, methane, etc.) it is a challenge to prepare this quasi-zero-dimensional system in an experimental apparatus. A direct-injection constant-volume combustion chamber is a promising device that can reasonably approximate this 0-D system under some conditions and is thus suitable for comparison with model results and thus for model validation. The present study examines the injection process of the Cetane Ignition Delay (CID) 510 system. This constant volume system uses bottled air, electric heaters, and a modern diesel fuel injector to quickly (<5 ms) introduce fuel into the hot, high pressure system. The fuel subsequently ignites, and a fast response pressure measurement is used to quantify the delay between injection and ignition. Ignition delay and combustion duration were measured for iso-octane and compared to the model data at temperatures ranging from 650K to 1000K for global equivalence ratios of 0.5 and 0.7 at an injection pressure of 1000 bar. The results demonstrate that the CID can separate the kinetic and spray effects in the injection process, suggesting that this platform can be used to validate chemical kinetics.
Abstract:
Humans tend to create identities for themselves, or find others to which they may assimilate. Similar identities come together to form groups, and these groups take on specific roles. Roles work together to create a functioning environment, ranging from a small-scale household to a large functioning government. Although identities seem to function well overall, some are highly limiting. Oftentimes within society, individuals fit in on the basis of their phenotype. However, identities can vary over time and by culture. Seemingly unrelated, defining moments of dance are created in this way. Specifically, modern dance was born and revolutionized dance on the basis of breaking identities. One of the key purposes behind modern dance was to break free from the confinements of ballet. Not only was this category being broken, but societal constraints were broken as well. This paper will explore the revolution of modern dance in two main ideas through dance artists' work and manifestos. The first main idea focuses on how dance artists like Pearl Primus and Katherine Dunham broke out of the confinements of their identity based on race. Isadora Duncan, Loie Fuller, Ted Shawn, and Martha Graham broke out of the confinement that society placed on a gender. Although these dancers changed physical types of movement, they also rejected limits placed on them by their defaulted identity.
Student Presenter: Emma Pepperman  
Title: Where Legends Were Forgotten: Enslaved Workers at the University of Alabama, 1831-1865

Abstract:

On the University of Alabama's home webpage is a link explaining the Capstone's slogan: "WHERE LEGENDS ARE MADE is about the past, present and future of The University of Alabama. It speaks to the aspirations of our students and their parents, to the pride of our alumni and donors, and to the devotion of our legions of fans in our state, across the nation and around the globe. It highlights our successes and the legacy we will continue to build upon." With almost 200 years of history in Tuscaloosa, The University of Alabama has a large number of great legends in its history. Among those legends are the enslaved workers who built and served on campus but their contribution to UA's success is often overlooked. UA, which opened in 1831, owned some slaves and hired many others from local slaveowners between the time that campus opened and the end of the Civil War. Enslaved workers served faculty members and students, made repairs on buildings and the grounds of the campus, built furniture, and assisted professors with teaching and research. This paper will explore sources written by white men to tell stories of the enslaved workers who lived and labored on UA's campus. By looking at diaries, receipts, notes from faculty meetings, and other sources for and about the leaders of the school, found at the Hoole Special Collections Library, this paper will piece together what enslaved workers on campus did, why they were so often hired by the university, and how certain skills were monetarily valued over others. It will also paint a picture of what daily life looked like for slaves on campus.
Student Presenter: James Pezent

Title: Mission Architecture to Explore Multiple Near-Earth Asteroids: An Extension to NASA's NEA Scout Mission

Abstract:

As a part of NASA’s Exploration Mission One (EM-1), thirteen low-cost CubeSats were selected as secondary payloads to be launched with the Orion Multi-Purpose Crew Vehicle. One such spacecraft, NEA Scout, is a 6U CubeSat that employs a solar sail as a low-thrust propulsion system to perform a close flyby of a small near-Earth asteroid. In this study, targets for NEA Scout are reassessed for assumed launch dates in December of 2019 and June of 2020. Emphasis is placed on constructing trajectories that can enhance the mission’s scientific return by visiting one more additional Near-Earth Asteroids in addition to the primary rendezvous target.

To accurately model the behavior of the NEA Scout under the multiple gravitational and non-gravitational forces, a high fidelity dynamical model was developed. The system model employs ephemeris data for the inertial time-dependent position history for all bodies under mutual gravitational influence. Additionally, a non-ideal square sail model, which accounts for the optical properties associated with the NEA Scout solar sail, is incorporated to accurately simulate the thrust generated by solar radiation.

A range of potential target asteroids exist that warrant further feasibility investigation. Candidate asteroids for rendezvous were identified based on an analytical estimate for the time necessary for the NEA Scout to leverage the sail, thus, the solar radiation pressure, to match the orbital plane of the target asteroid. Furthermore, the tour order was constructed from the targets that exhibit small relative inclinations and phase angles, thus allowing fast and efficient transfers between subsequent target asteroids.

As a test case for the current December 2019 launch date, a low speed flyby of one asteroid is performed, following which, NEA Scout continues its trajectory to perform a high-speed flyby with the next target asteroid. In this example, asteroids 2008 EA9 and 2007 UN 12 were selected for low and high-speed flyby, respectively. Owing to the small initial phase angle relative to Earth and the orbit being at a low inclination, asteroid 2008 EA 9 was chosen as the initial target. Whereas, asteroid 2007 UN 12 was selected as the follow-up target due to its small negative phase angle with respect to the potential flyby location of the first leg along the trajectory. The initial leg fulfills NEA Scout’s primary mission objectives of performing a low speed flyby with 2008 EA9 with time of flight (TOF) of 426 days (flyby distance 130m, flyby speed 8 m/s). The spacecraft then departs for 2007 UN12 and performs a high-speed flyby at 2.3 km/s 636 days later from an altitude of 1.9 km.

Solar radiation pressure from the Sun can potentially offer unique maneuvering capabilities to a spacecraft equipped with a solar sail. In case of NEA Scout, CubeSat technology, in conjunction with a solar sail, can be leveraged to perform close flybys and encounters with multiple Near-Earth Asteroids, thus, enhancing the cost-effective nature of the technology for scientific exploration.
Student Presenter: Matthew Pilus
Title: Software Gyroscope: Data Acquisition for Angular Velocity Estimation using MEMS Accelerometers

Abstract:
Microelectromechanical (MEMS) sensors are often used to measure body positioning, and are popular components in design and manufacturing requiring position measurements. Traditional navigation gyroscopes have commonly been used to measure angular velocity, but can be expensive, mechanically complex and often experience drifting, which often requires a high amount of maintenance. MEMS accelerometers, however, use passive sensors to measure acceleration, and have many advantages over traditional gyroscopes including compactness, very little drift, and little maintenance. This study seeks to investigate a more precise and low maintenance angular velocity estimator through improved data acquisition of a "software gyroscope", which is composed of four or more MEMS accelerometers mounted on a cube such that all accelerometers are non-coplanar. The data acquisition system will be modified from a microcontroller with analog accelerometers to the implementation of a single-board computer with digital accelerometers to provide faster sampling rates, as slower sampling can lead to imprecision in measurements as high-frequency data fluctuations can be missed by the data acquisition system. The single-board computer will also allow for the ability to directly store .CSV files and calculate angular velocity from the raw measurements while remaining completely wireless. This improved data acquisition system will be investigated for potential use in powered prosthetics and robotics, where compact and low-maintenance sensors are of critical importance.
Abstract:

Study: This project involves developing a logo for Public Relations Society of America/Alabama Chapter's campaign in partnership with Capstone Agency and Peritus Public Relations. The objective was to create a visual identity that conveys the ethical nature with the aid of qualitative and quantitative research.

Public Relations Society of America (PRSA) Alabama Chapter faces the challenge of promoting ethical practices among public relations students and educators. While PRSA Alabama has a thoroughly developed code of ethics, the organization can improve strategies for spreading awareness and action. Our goal is to most effectively integrate these ethical practices in the everyday lives of public relations students, educators and professionals.

Our team conducted three focus groups and a survey to gain insight from our target audience into the colors and imagery to use on a logo. All groups and individuals who took our survey are in the public relations field and have varying comprehension levels of PRSA's code of ethics.

The preliminary focus group was held during a senior-level public relations class of only Capstone Agency members. These students did not have prior knowledge of the campaign. The results from this focus group acted as the foundation of our survey. We prompted participants from the second focus group to take the survey before discussing. These participants were upper-level PR students in the nonprofit specialization who were previously tested on ethical standards. The final focus group consisted of PRSA Alabama Chapter members. These participants were professionals in the PR field who have to understand PRSA's code of ethics to join.

Results: We used our research as a foundation for the campaign's visual identity. From the results, the team developed eight logo options before narrowing it down to the official logo. We adjusted all deliverables to match the logo and maintain consistency for the rest of our campaign. The primary outlets of our implementation will include social media ideation and implementation, printable and electronic deliverables for the student chapters of PRSA Alabama Chapter, in-person information dissemination, and weekly ethical newsletters and case studies.
Abstract:

SMILES (Simplified Molecular-Input Line-Entry System) identifiers provide a method of representing chemical structures as line notations. Within these line notations, different text, numeric, or symbolic characters represent the structure of each molecule. We extracted out these structural descriptors, and wrote custom analysis scripts to characterize the SMILES for the frequency of various structural characteristics. From the resulting information, we produced various statistics and charts characterizing the open PubChem database containing over 90 million chemical structures. We are currently working on using the same SMILES identifiers to analyze how the structure of chemical compounds may relate to market prices. For this, we used data from https://pubchem.ncbi.nlm.nih.gov/ and http://www.tcichemicals.com/en/us/. This research expands upon previous studies on using computer software to work with SMILES without the use of cheminformatics toolkits. Our objective now is to derive correlational data from the basic statistics we already gathered, aiming to answer questions like "Do molecules with more double bonds also tend to have more branching?" In addition to that, we will gather price data for a significant number of chemical compounds and pair it with our structural data to determine any correlations.
Abstract:

Gas separation data for polymer membranes has traditionally been shared in the form of Robeson Plots within journal articles. Robeson Plots depict the relationship between gas selectivity and permeability for a given gas pair of interest (e.g., CO2/N2). For the past two decades, the membrane community has relied on Robeson Plots to benchmark and compare membrane selectivity/permeability data. Unfortunately, the current format of publishing Robeson Plots within journal articles as static figures makes it difficult to compare and share data. We are seeking to overcome these challenges by compiling and creating online repositories for Robeson Plots where researchers can interact with membrane data in new ways including enhanced visualizations, downloading machine-readable datasets, and contributing their own data via crowdsourcing. This poster will explain our initial efforts and how we have incorporated this project into our undergraduate curriculum at The University of Alabama.
Abstract:

Many 3D printers make use of a print head which travels in horizontal x and y movements and deposits a thin layer of material. To move to a new layer, a small height movement is made in the z-direction. The Spherical Additive Manufacturing (SAM) project aims to create a 3D printer which operates via rotations and radial adjustments about a fixed point rather than in an x-y direction. By using the spherical coordinates (theta, phi, and z), the print head moves in an arc motion. This allows for objects, composed by traditional methods as a series of vertical layers, to be created natively spherical. To construct this printer, an overall frame was assembled from aluminum V-slot rails. To achieve rotational motion, a half-ring assembly was built and attached to two NEMA 17 motors about a central axis. At the center of the half-ring, an arm extends, and it can be rotated by way of an exclusive motor. A spherical ball is attached to the end of the arm. This ball acts as the printer’s build surface, and material is deposited onto it by a print head suspended above. The print head is supported by an elevator, which allows for radial motion in the z-direction.

By using these three motions, material from the print head is deposited onto the rotating ball, and layers resembling shells are created. As an object is created, the elevator slowly raises upward, and the print expands radially. To control the motors and other components, the printer uses a RAMPS 1.7 board paired with an Arduino, a commonly used arrangement in hobby 3D printers. Mechanical endstops are used to report when the printer has reached its movement capacities. Other components include a power supply and a Titan Aero combined print head and extruder. Operating a 3D printer in spherical coordinates calls for a novel approach to the software. The main challenges are adapting conventional 3D printing techniques to the new coordinate system and being able to move the axes reliably. In order to move each axis with enough precision, microstepping and gear reduction are utilized on the motors coupled with them. With the help of open-source software like Printrun, experimentation of actual printing technique can be performed once a fully-functional prototype is obtained. By creating a proof of concept, the SAM project aims to promote further innovation into novel additive manufacturing processes.
Abstract:
Lithium-ion batteries are found everywhere nowadays from laptops and cell phones to hybrids and electric cars, this technology is growing in popularity due to its lightweight, high energy density, and ability to recharge. These batteries have the ability to recharge based on the lithium ions movement from a positive electrode (cathode) to a negative electrode (anode) during the charging and vice versa during discharging. One of the most common used cathode materials is LiCoO2 with a two-dimensional layer α-NaFeO2 type, which has a high theoretical capacity of 274 mAh g⁻¹ and high energy density.

However, its actual capacity in commercial Li-ion batteries is typically limited to approximately 140 mAh g⁻¹, while it’s charging voltage is no more than 4.2 V (vs. Li+/Li). This is because the LiCoO2 electrodes rapidly degrade at higher charging voltages, which is caused by many reasons such as phase transitions involve rearranging the atomic stacking, dissolution of Co, formation of the spinel phase, attack by HF, and reduction of Co. It is known that the charge/discharge performance of the LiCoO2 electrode can be improved with surface modification. Recently, metal oxides coating (Al2O3, TiO2 and Fe2O3) has been reported to suppress the capacity fading in LiCoO2 even at above 4.5 V. In this work, 1, 5, and 10 wt.% of Al2O3 was deposited on the surface of the LiCoO2 particles by precipitation method to determine the most efficient amount of Al2O3 needed for improving the cyclic performance of the LiCoO2 electrode.
Abstract:

Ultrahigh temperature ceramics (UHTCs) are a distinct class of materials that have melting temperatures in excess of 3000°C. Though ceramics are often thought of being hard and brittle, specific phases of UHTC transition metal carbides can exhibit significant plasticity, with the extent of plasticity increasing with temperature. Here, we have applied a new method of thermo-mechanically testing materials at extreme temperatures using a novel non-contact method. By passing an electrical current through a material, it is resistively heated, and in the presence of a magnetic field, this current will exert a non-contact Lorentz force. Using these two properties, a thermo-mechanical testing set-up, referred to as the Electro-Magnetic Mechanical Apparatus (EMMA), was constructed. We have measured the deflection of HfC and TaC in EMMA over a variety of loads to temperatures up to 2900°C. It was found that HfC deflected significantly more than TaC which has been contributed to its smaller grain sizes making it more susceptible to Coble creep responses.
Student Presenter: Qinfeng Ruan
Title: Influence of Thermo Hydrogen Treatment on Microstructural Evolution and Hydrogen Desorption Behavior of Titanium Alloys

Abstract:
Not Publishable
Student Presenter: Nicole Sempertegui
Title: A combined compression molding, heating, and leaching process for fabrication of micro-porous poly(ε-caprolactone) scaffolds

Abstract:

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Abstract:

The chaotic nature of the Earth-Moon system is leveraged to design spacecraft trajectories. To investigate the underlying dynamics that govern the motion of a spacecraft, the two celestial bodies (Earth and Moon) along with the spacecraft are studied as the circular restricted three body problem (CRTBP). The CRTBP is a reduced form of the N-body problem, accounting for only the gravitational influences of two primary bodies on a third body (spacecraft). The increase in modern computing power allows for faster, more accurate investigation of mission design scenarios, as the CRTBP continues to see widespread use in preliminary trajectory design. The presented research attempts to bridge the gap between computational analysis and intuitive data visualization by employing new visual tools, such as 3-D visualization and virtual reality (VR).

The visualization is accomplished using the commercially-available game engine, Unity, and the HTC Vive VR headset. Models depicting the Earth-Moon dynamics are derived from the numerical data computed at the beginning of the investigation and are employed as three-dimensional objects within the VR simulation. This allows for greater interaction within the system and the ability to view changes in real time. Programming languages such as C++ and Python are used to carry out numerical investigation and collect information which is later utilized in assessing the dynamical environment around the Earth-Moon system. Zero velocity curves and surfaces that bound the motion of a spacecraft are analyzed, along with families of periodic orbits around the equilibrium points, known as the Lagrange points. These structures will later be employed for analysis of minimal energy transfers within the CRTBP while designing spacecraft trajectories.
Student Presenter: Zach Smith

Title: Discrepancy Between Contemporary World Literature and English Translation

Abstract:

It is estimated that approximately three percent of international literature is translated into English, meaning that a typical monolingual American only has access to three percent of the rest of the world's literature. Writing and literature have been one of the most basic forms of mass communication for thousands of years, allowing individuals from different backgrounds or cultures to express varying thoughts, opinions, and ideas. A limited understanding of contemporary world literature leaves Americans at a distinct disadvantage. Aside from limiting the learning of students and scholars, this cultural disconnect can contribute to feelings of ethnocentrism, xenophobia, and appropriation. After studying a number of translated novels that achieved varying levels of success in the United States, I have concluded there is a clear relationship between the likelihood a text will get translated into English and the levels of non-normative sexuality that it contains. In the context of this research, the term "non-normative sexuality" is used to define any sexual actions or preferences other than a heterosexual, monogamous marriage between a woman and a man of no hereditary relation. Books that offer numerous instances or opportunities for non-normative sexuality have a higher likelihood of being published in the U.S. due to the rapidly changing and increasingly accepting social landscape. Furthermore, authors also have a higher likelihood of translation if their works repeatedly receive recognition from their own country, which adds a degree of difficulty to their task. It is challenging enough to write something that will be successful in one's own culture, but to create a piece of work that also meets the changing sexual constructs of the U.S. is another obstacle entirely. "The Discrepancy Between Contemporary World Literature and English Translation" proves the correlation between non-normative sexuality and translation through the analysis of literature and data, in the hopes of bringing attention to a critical issue facing modern literature.
Abstract:

Not Publishable
Student Presenter: Samantha Thomas, Pablo Ramos Ferrer
Title: Water Processable Polypyrrole:Poly(2-acrylamido-2-methylpropane sulfonic acid) Electrode for Energy Storage Applications

Abstract:

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Abstract:

The importance of creativity in developing children has been deemed paramount, however very little is known concerning how creativity is affected by a child’s environment. In addition, the social contexts of an adolescent’s life are thought to influence their ideas of hopefulness and subsequently, their risk factors for crime and addictive behaviors. Therefore, this study aims to investigate how the social and physical environment of a child can affect their conceptions of hopefulness. This study will utilize the Substance Use Decision Study data (SUDS) which presents a unique sample both in its participants and in that the data have never been used. The SUDS project presents an interesting data set because it is comprised mostly of low socioeconomic African-Americans. SUDS data were collected from students who had participated in the Mobile Youth and Poverty Study and who were between the ages of ten and twelve. Approximately 500 students and their parent(s) or guardian(s) participated in this study. The parent or guardian were asked questions about their family structure, income, and demographic factors (i.e. questions concerning number of parental figures in the home, number of children supported by the parent/guardian, and the education of the parent/guardian). Then the students were asked to illustrate what 'Hope' signified to them, and write a brief explanation. Students were not guided in the drawing process outside of this one prompter. This data was collected to look for risk factors of crime and addictive behavior in the students. The hope drawings will be categorized by theme and evaluated qualitatively. Then, they will be coded using the four descriptors of creativity as described by Guilford’s creativity model for a more quantitative measurement. As such, their drawings will be evaluated based on the number of items drawn (fluency), the different types of items drawn (flexibility), the uniqueness of the items drawn (originality) and the detail of the drawings (elaboration). Some of these factors can be seen in the number of colors used, the number of objects drawn, the detail of design given to objects, and the variability in items drawn. By coding overt behavior, we hope to find notable connections between aspects of a child’s environment and how they depict hope. Once all drawings have been evaluated we will use correlation and regression models to determine if the social constructs can be used to predict certain themes and see how these predictions correlate with creativity. This study looks for connections between the social context of where a child lives - their social environment, demographics, family structure, income, hopefulness - and the themes and creativity of their drawings of hopefulness.
Abstract:
Enzymes are used in a variety of ways in several industries. Several important concerns for their use are the prevention of enzymes from breaking down during a process and the ability to recover them afterwards for reuse. The immobilization of enzymes is a process used in industry to prevent enzymes from aggregating or being damaged; however, immobilized enzymes can not achieve the same reaction rate reached by free enzymes for two reasons. The first reason is that immobilized enzymes are not able to move and can not diffuse throughout the solution, which means that free enzymes react over a larger amount of volume than their immobilized counterparts. The second reason is that the substrates of the enzymes must navigate through the pores of the material to reach the enzymes, which makes pore size directly related to reaction rate. The Metal-organic Framework (MOF) is one immobilization method that has been particularly successful in both stability and reaction rate, but reaction rate of MOF's still can not reach the same level as free enzymes. To achieve the optimum stability offered by immobilization and a reaction rate close to free enzymes, I propose the attachment of enzymes on the surface of 2-Dimensional MOF's.
Abstract:

Upon its debut as a new medium of communication, Vine, a platform developed to record and share videos of six seconds or less, presented a distinct set of characteristics that burgeoned its success, but by offering services that utilize the same characteristics, Vine's competitors, namely Instagram and Snapchat, diminished Vine's user base, giving insight as to how some mediums may prove unsustainable. My research specifically explores the three main characteristics that distinguished Vine: its six second video restriction, its automated looping of content, and its built in social media platform. These three qualities enabled Vine to become popular, but other platforms appropriated Vine's distinct features. By analyzing exactly how these characteristics were appropriated, my research explores the qualities these characteristics bring to new mediums of communication and how they may be best utilized to increase the sustainability of new media platforms. Vine is a perfect case study of new media within medium studies because of its rapid ascension to popularity, which in itself lends validity to the medium's value, and its equally quick descent to obscurity, which draws major questions about the volatile nature of new mediums. This research deconstructs Vine's medium and its competitors' to find out exactly what made it wither on the Vine.
Abstract:

Internal is a sonic project created by Jared Tubbs, a Creative Campus Arts Research Fellow under the mentorship of Dr. Andrew Raffo Dewar, Dr. Todd Freeborn, and Holland Hopson. Drawing inspiration from Alvin Lucier's "Music for Solo Performer" and its use of brain waves as generators of sound, this project aims to explore further the musical creations that can be made from the human body by creating additional variables based on biological signals. Internal does this by combining the use of a survey system in the Max media programming environment with electroencephalogram and electromyogram sensors detecting brain and muscle activity as well as heart rate to create a system capable of creating unique sounds from each individual when they partake in the project. This project is intended to emphasize the uniqueness within each individual, as well as encourage continued exploration and collaboration between the arts and engineering.
Abstract:

This paper examines the correlation between segregation in Huntsville, Alabama and the arrival of the National Aeronautics and Space Administration (NASA) in the city in 1958. Using various newspaper articles from the time period, it argues that the economic prosperity brought to the city from the new government agency contributed to the process of integration. Based on previous literature in the field, historians have analyzed the federal investment in education and housing in the South. How government programs, such as NASA, affected the segregation issue in the South remains minimal in analysis. Segregation played a strong role in Alabama society and politics during the early and mid-twentieth century. Also during this time, Huntsville experienced varying degrees of prosperity. Placing NASA in Huntsville brought economic profit similar to prior experiences of success in the city. Not wanting to lose financial opportunities, city leaders looked for a way to continue the success. Because of threats leaders received about removing NASA from Huntsville if segregation continued, integration was required. The paper looks at the impact of the government using agencies to develop different areas and cultures. The government used NASA to promote their agenda in the American South. The success of this attempt demonstrates how the federal government can increase spending in one area of society to develop another. By funneling money into the economy of Alabama, the federal government solved a culture issue. This paper also examines the ways the federal government can sway state governments. Segregation was an issue of states' rights versus federal rights. The triumph of the federal government in convincing Huntsville leaders (then Alabama leaders) to end segregation shows the influence the federal government exercises over individual states. This study held limitations that impacted research. Most of this research was completed in Tuscaloosa, Alabama. The availability of data online provided enough evidence and data to conduct thorough research, but if it had been completed in or near Huntsville, more newspaper articles and oral histories could have been obtained. Another limitation was the time allotted to complete research. This paper was researched and written within approximately three months. A greater amount of time to devote to this project would have yielded more results, but making sure the conclusions drawn were detailed reduced the number of findings for this paper.
Abstract:

This essay explores the history of Native American dances and the influences on Modern Dance. This essay will address the many functions of dance in Native American culture, from ceremonious to social, with an in-depth look at a few specific dances including the Ghost Dance, the War Dance, the Rain Dance, the Sun Dance, and the Hoop Dance. Additionally, the effects of American Colonization on Native American dances and culture are explored. Various Native American movement styles and themes will be explored. As many tribes have their own dances, the differences between tribes as well as the differences between specific dances within those tribes will be analyzed. The technical aspects of these dances and how that technique serves the purpose of the dance is also addressed. The author then examines the influences and effect Native American Dances had on Modern Dance and the similarities between the two. Finally the essay concludes with the role of Native American Dances in today's society, both within their respective tribes and without.
Session 4: 2:30-4:00 | Arts & Humanities; Engineering
Category 1: Work in Progress
Poster Number: 71

Student Presenter: Cole Wagenhals
Title: Analyzing NiAlZrSi as an advanced thermal protective coating for jet engine blades.

Abstract:

Not Publishable
Student Presenter: Minda Wagenmaker  
Title: Optimization of gain parameters for transient heavy duty testing

Abstract:

This research is the beginning of a staged effort to implement control system gain optimization to several internal combustion engine testing and operation applications. The first stage consists of developing a simple dynamic system model to evaluate various gain-scheduling and self-adjusting control strategies in software. The first hardware application for these strategies will be to optimize engine dynamometer control to improve EPA heavy-duty transient test validity success rates. Such tests are performed to quantify heavy-duty engine emissions and compare them to maximum allowable certification values. During these tests, an engine is operated through a prescribed speed and load schedule that lasts approximately twenty minutes. The actual engine speed and load must remain within a specified tolerance of the prescribed schedule for the test to be considered valid. Therefore, it is crucial that the engine can quickly and accurately adjust to match the requested speeds and loads or else the test results cannot be used. These adjustments are made through the engine and dynamometer control systems which typically use a proportional-integral-differential (PID) strategy. This research looks to evaluate PID gain scheduling and neural networks to change and optimize the PID parameters as the test proceeds. Applications reserved for later stages of the research include turbocharge and exhaust-gas recirculation system control.
Student Presenter: Maxwell Ware, Adam Alturaiki
Title: Self-Healable Polyelectrolyte Films Through a Layer-by-Layer Assembly Process

Abstract:
Self-healable materials can greatly enhance reliability and lifetime of materials used in various applications. Recently, it was reported that some polyelectrolyte multilayer films can self-heal their mechanical damages when water is added. Our research aims are to create these self-healable multilayer films using a layer-by-layer assembly and study the effect of assembly parameters such as solution pH and salts. We build up three different films using strongly charged polyelectrolytes and weakly charged polyelectrolytes: polyethylenimine/poly(acrylic acid), poly(diallyldimethylammonium chloride)/poly(acrylic acid), and polyethylenimine/poly(styrenesulfonate). The film thickness was measure using profilometry, and optical microscopy was used to evaluate their self-healing capability. It was shown that the weak-weak polyelectrolyte pair, polyethylenimine/poly(acrylic acid), exhibits most efficient self-healing capability.
Abstract:

The inspiration for this collection started with an examination of Analytic Cubism and the works of Picasso and Braque. I wanted to examine the way Cubism fractures the picture plane in order to look at all components of its real life subjects. Taking all that information and attempting to visually portray it, I wanted to attempt to such a look but with gender, in its relation to clothing. I used the geometric splintering in Cubist works to form initial silhouettes and seaming. I based my primary color pallet off of Analytic Cubism's neutral brown tones, picking an array of creams, beiges, and browns. I wanted to add a punch of energy with a strong blue and burnt orange. I was drawn to textiles with varying surface textures to layer and contrast. This was reminiscent to me of the texture surfaces of Synthetic Cubist works using multimedia and found objects. With the tones and nature of my textiles, the collection formed organic shapes and a softness juxtaposed by more structured construction oriented pieces. This collection is my interpretation of gender neutrality through a Cubist lense.
Student Presenter: Lauryn Woodyard  
Title: MATLAB software tool towards automated analysis of surface electromyography data to support clinical research of musculature activity during swallowing

Abstract:

Background: Surface Electromyography (sEMG), has been identified to assist in dysphagia (disordered swallowing) rehabilitation in pediatric and adult populations. Noninvasive, electrodes attached to the skin external to a targeted muscle capture the sEMG signals related to the muscle activation, which can be displayed graphically as swallowing events occur to provide immediate feedback to clinicians. To date, normative sEMG values for swallowing have not been widely established in healthy adult populations, nor has a tool been developed to efficiently provide in depth analysis of swallowing data. This work aims to provide automated analysis tools to clinician driven studies seeking to establish normative sEMG values in young, healthy adults.

Purpose: The aim of this project was to create and evaluate a software tool that organizes the overwhelming amount of sEMG data generated from swallowing studies, to support clinicians in extracting sEMG features [average swallow duration, peak muscle activity] from collected datasets. sEMG data can be sampled hundreds of times per second, resulting in files containing thousands of data points (approximately 106,700 data points per file in one instance). When considering multiple swallowing sessions per participant across multiple participants enrolled in a study, the amount of generated data builds up quickly. While tools exist to plot this data in real time during data collection, there is not an existing tool that allows clinicians to efficiently and easily conduct post-processing analysis on the raw sEMG data without additional technical software coding expertise; providing the motivation for this work.

Methods: A MATLAB script was developed to create an inventory of de-identified participant raw sEMG data collected from pharyngeal and oral muscle groups using a Synchrony sEMG device. A text-based interface allowed user selection of data sets for viewing or analysis. Based on user selection all specified data sets were post-processed by applying a root square mean smoothing process and peak detection algorithm to extract peak muscle activities and swallowing durations. Visualizations of the post-processed data were generated with the quantitative features and were organized and output to support further statistical analysis.

Result(s): The MATLAB tool was applied to clinician collected swallowing data from 14 healthy, adult participants during a protocol requiring spontaneous and on-command swallowing of 5 mL, 15 mL, and 25 mL amounts of water. The tool generated duration values, peak oral muscle activity values, and peak pharyngeal muscle activity values for all identified swallows from each participant. To validate the post-processing, the MATLAB processed data was visually compared to the Synchrony graphical data and swallow markers documented during data collection; which showed very good agreement.

Conclusion: The MATLAB tool was developed and applied to extract sEMG features from clinician generated swallowing data to support further statistical analysis, without requiring manual processing by the clinicians. The program is scalable and modular, so it can be further developed to increase the level of automation while also being applied to an increasing number of data sets as the study progresses.
Abstract:
"Tracing Heath," written by Moon Yang under the guidance of the Director of Undergraduate Creative Writing, John Estes, is a novella in which Heath, a foundling from East Asia adopted and raised by a privileged British family, struggles with various forms of social exclusion and personal alienation, developing a complex concerning his heritage and identity. A promising poet with many enviable advantages, Heath nevertheless experiences himself as a hopeless exile-unable to define himself in relation to the life he has known, to those who love him, or to the work he so longs to do-pushed by fate to confront this ultimate, irresolvable conflict. Arranged in a non-linear order to resemble the disordered nature of memory, the chapters are composed, like sonnets, following strict formal rules, yet attempt to lyrically evoke the feel of a dream.
Abstract:

The Millennium Development Goals (MDGs) target for sanitation used a binary (pass-fail) indicator: proportion of the population using "improved" sanitation that is not shared between households. Pass-fail targets are simple to evaluate but provide no credit for many efforts that protect human health like shared latrines to eliminate open defecation (OD). The WaSH community has long called for an approach to sanitation progress that gives credit for improving service levels (e.g., Bartram, 2007). Typically, these are termed "ladder" approaches, wherein the progress of a population up from the bottom "rung" (OD) and all progress to higher rungs (e.g., from unimproved facility to improved shared) contribute to progress. Visualization of the ladder is common, most notably in the WHO/UNICEF Joint Monitoring Programme (JMP) reports. However, changes in the population on the middle rungs of the ladder (e.g., improved shared) are ambiguous; changes can represent progress or regression. Therefore, a method was needed to quantify ladder progress in a clear and concise way.

We will present the following: (1) the first global analysis of progress on the sanitation ladder during the MDGs; and (2) ladder progress vs. progress using the MDG criterion

We used public JMP data and gap-filling methods to estimate missing values and maximize the included population for this analysis. We used a four "rung" ladder and developed a simple "ladder score" metric with a multiplier for each ladder rung: OD (0.0), Unimproved sanitation facilities (0.33), Improved shared facilities (0.67), and Improved facilities not shared (1.0). Ladder score is calculated by multiplying the % population on each rung by the multiplier for that rung, then summing those four values. A country with all persons on the top rung would score 100%.

Using public JMP data and filling gaps, we built a database with complete data for 190 countries with 99.8% of global population. We fit separate urban and rural regressions in each country to account for the differing challenges.

We found no evidence that pass-fail MDG targets discouraged progress lower down the ladder. In fact, progress was greatest further down the ladder. Using the standard "proportion of population without X" formulation: Global progress toward elimination of OD (45% of gap closed) exceeded Ladder Progress (38%) which exceeded MDG progress (30%).

Country-level results and projections varied widely. Some countries that made "limited or no progress" on the MDGs made major ladder progress through diverse means. Most MDG regions are held back by one or a few countries where progress has stalled; some few large countries are well off-track or regressing on OD.

The SDGs on OD and universal coverage are unlikely to be met based on current trends. Many countries eliminated OD by 2015 (60 of 190 countries) or are on-track for 2030 (31 more countries). Most countries are on track to eliminate OD in urban (116 of 190 countries) and/or rural (103 countries) areas by 2030. A quantitative ladder-based approach can yield simple and understandable targets while also providing credit for diverse approaches to provision of sanitation.