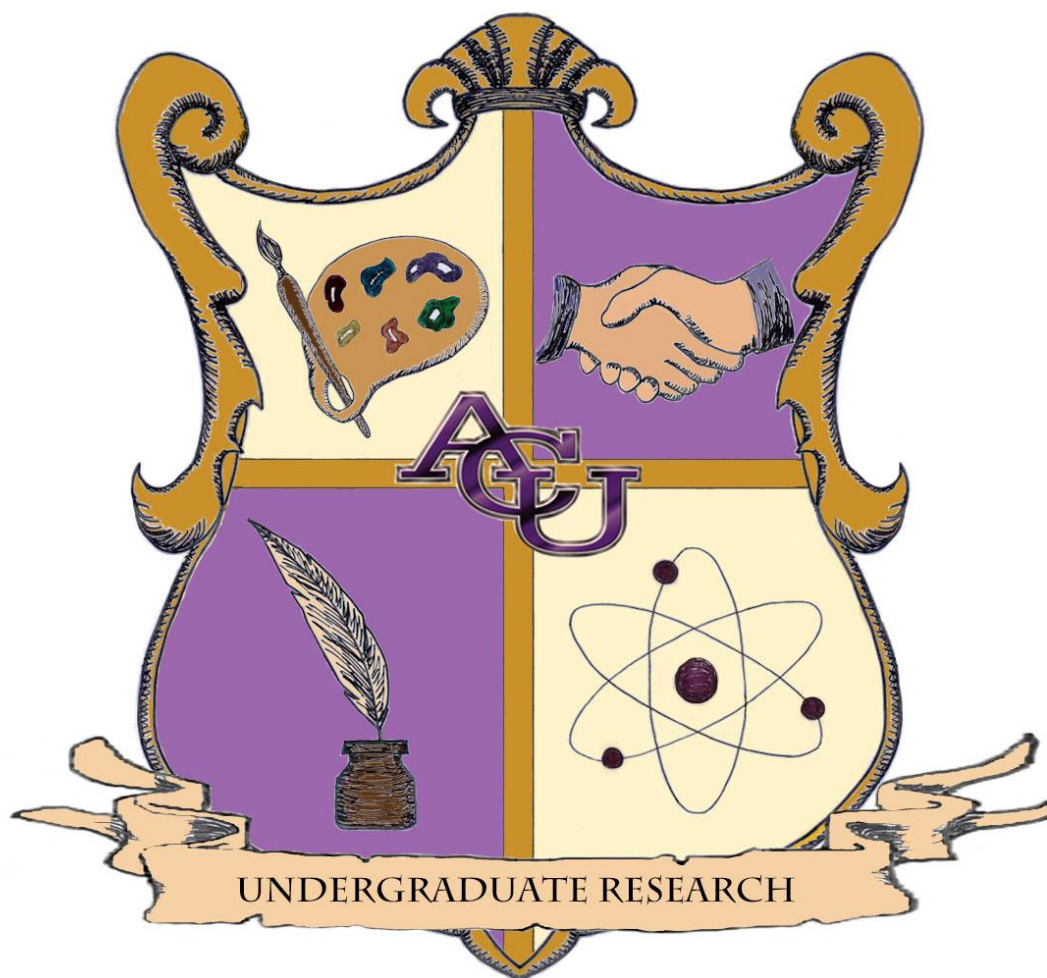


2015 ACU Undergraduate Research Festival



Abstracts

SESSIONS

Tuesday, March 31, 8:30 – 9:20 AM

Session A1: Ethics and Scriptures - McCaleb Room Zone A

The Higher Ethics: Utilitarianism and Freedom in Three Dystopian Novels

James Churchill

The Origin and Impact of United States' Geo-Political Military Aid In The World.

Coleton Spruill

In the newly polarized world of the late 1940s, the United States established policies for the containment of communism. These policies were carried out in two ways. First: the United States supplied economic stimulus to the countries of Western Europe; second: the United States supported democratic governments and armies with military support and funding. This presentation will explain the origins of Geo-Political Military Aid and show that aid extended in later conflicts such as the Korean and Vietnam Wars followed naturally from American policy decisions made while aiding Europe in the late 1940s.

Transactional Reading and the Bible: What Does It Mean for Us?

Ashley Towe and Katlin Sehres

During this session, the presenters will share multiple applications of Louise Rosenblatt's transactional theory of reading for biblical interpretation. Rosenblatt's theory states that meaning is made in the transaction between a reader and a text, which diverges from theorists who claim that meaning is found solely in the text or solely within the reader. Rosenblatt emphasizes a number of factors that a reader brings to a text at any given time and in any given setting. Through in-depth reading, journaling, and discussion of Rosenblatt's major works and those of related scholars, the researchers identified major themes in her theory and applied them to reading the Bible. According to Rosenblatt, community aids a reader in determining the validity of his or her own personal interpretations based upon certain criteria, agreed upon by the group. These criteria are that nothing is added to the text that is not present in the text, that nothing in the text is ignored, and that undue emphasis is not given on any particular aspect of the text. Community also helps readers solidify their own interpretations and widens their perspective. Rosenblatt stresses the importance of a teacher's role in creating an atmosphere that allows for explorative interpretation while also serving as a guide and facilitator for discussion. These implications for teaching Scripture and valuing community help provide useful tools for church and small group leaders as they address and celebrate the differences readers bring to and take from the Bible.

Session A2: Culture and Crises - McCaleb Room Zone B

The Moore, Oklahoma tornado crisis

Audrey Gonzalez

This paper will analyze the response of Governor Mary Fallin during the Moore, Oklahoma tornado crisis in 2013 according to the theory of Discourse of Renewal. The tornado that occurred on May 20, 2013 devastated the people of Moore and Governor Fallin had to be quick with a response. This paper will argue that Governor Fallin was effective in her response and successful at uniting the community. She reduced uncertainty with her responses to the public

and utilized the four objectives from the Discourse of Renewal in order to be an effective leader. This paper will further analyze Governor Fallin's press conference and Twitter updates as she inspired stakeholders to rebuild the community of Moore.

Keywords: Discourse of Renewal, stakeholder, renewal, organization learning, ethical communication, organizational rhetoric, optimism, prospective vision.

Toyota Gas Pedal Recall

Naomi Johnson

This paper analyzes the image restoration strategies of the Toyota gas pedal recall. In late 2009 Toyota began to get reports of their cars having cases of unintended acceleration. After hearing about this, Toyota released numerous articles and ads that informed consumers of what was going on and how they could protect themselves if they experience unintended acceleration. Toyota made recalls on a wide selection of vehicles that they felt were not safe for their customers. Two of the major strategies Toyota used to save their reputation were corrective action and bolstering. This paper argues that the image restoration strategy chosen by Toyota was not as effective as it could have been due to the mix of strategies used.

Keywords: image restoration, Toyota, bolstering, corrective action

Cultural Synthesis in Sir Gawain and the Green Knight

McKinley Terry

This study examines the historical significance of the poem *Sir Gawain and the Green Knight* by examining its role in synthesizing different cultures, primarily the Celtic and French traditions present in England in the fourteenth century. The goal of this paper is to demonstrate, through analysis of the poem's text, as well as examples of Celtic and French Arthurian literature, that Sir Gawain represents the possibility of bridging two conflicting cultures. It also seeks to highlight the timely significance of the poem's creation by looking at the conflicts that took place between Wales and England during this time period.

In addition to scholarly research already published about the *Sir Gawain* text, three main texts have been utilized for this study. This includes the original poem itself, as well as *The Mabinogion*, a collection of Welsh tales, and Chrétien's *Arthurian Romances*, French Arthurian legends. These texts are used to demonstrate cultural differences between the Celtic traditions of Britain and the French aristocracy that arrived in England with the coming of the Normans. Contrasts within the literature, as well as the cultures themselves, are juxtaposed against the Welsh rebellions that took place against the English monarchy around the time of the *Sir Gawain* poem's composition. The text of the poem itself is then analyzed to examine the apparent syntheses of these two disparate cultures, especially in the characters of the Green Knight and Sir Gawain.

The syntheses of Celtic and French cultures in these characters is next demonstrated to show the significance of the *Sir Gawain* poem as a call for peace between two traditions that faced great conflict in the late fourteenth century. Special attention is paid to the rebellion of Owain Glyndwr against King Henry IV of England, an ongoing conflict that took place around the time of the poem's composition. In this context, Sir Gawain calls for reconciliation between the Celtic and French traditions, using the shared legends of King Arthur and his court to make this call. Such an analysis of these texts places the *Sir Gawain* poem in its proper historical context as a text of social commentary and a call for cultural synthesis. In this sense, Sir Gawain's quest is

not only a test of his own personal virtue, but a quest to discover the soul of Britain itself. Not only does the poem serve as a window into the past of British literature; it demonstrates a significant and turbulent time in that nation's history as well.

Session A3: Health: Food, Aquaponics, and Smoking Cessation – Alumni Conference Room

Children's Fruit & Vegetable Consumption

Priscilla Clayton

The dramatic increase in the obesity epidemic has become a public health crisis. The obesity epidemic has doubled in the last 20 years, though individuals in today's society are unaware. The aim of this study is to analyze two quantitative tables from two pre-existing articles qualitatively, using data from the USDA and the American Dietetic Association. We observed the difference in children and adolescent's fruit and vegetable consumption based on their socioeconomic status (SES). Both pre-existing data sets were from the National Health and Nutrition Examination Survey (NHANES), and used the following dietary standards—Healthy Eating Index from 2005 (HEI-2005) and MyPyramid. There was not a significant difference in fruit and vegetable consumption between high and low socioeconomic groups. However, one study showed that the higher income had greater intake of fruit and vegetables while the other study showed that those of low income had higher intake of fruits and vegetables. As of 2011 the current dietary standard is MyPlate, in which further research is needed to observe whether the current dietary standard will help reverse the obesity crisis in children. Likewise if certain underlying factors still contribute to the obesity epidemic today and if the current dietary standards such as MyPlate is effective as well as educating children and adolescents as of 2014.

Nurses' Role in Tobacco Counseling: Ending the Epidemic

Dulce Mancine

More than 480,000 deaths and \$193 billion in medical expenses each year are attributed to smoking tobacco (U.S. Department of Health 2014). Smoking tobacco is an epidemic that burdens the United States health care system. Nurses are in a unique position to provide tobacco cessation interventions to patients in the clinical and community setting. The objective of this study was to measure how frequently nurses provide tobacco cessation interventions to patients and determine factors associated with the delivery of those interventions. The Helping Smokers Quit Survey was utilized to conduct a cross-sectional survey study. Permission to use the survey was granted by Dr. Linda Sarna and colleagues. Descriptive statistics and independent t-tests were used to analyze the data gathered from the survey. The sample included 237 nurses. The results showed a low frequency of nurse-led tobacco cessation interventions among nurses. Also, previous tobacco cessation training and familiarity with the 5A's of tobacco cessation had a significant association with a higher frequency of tobacco cessation interventions. The findings suggest more education for nurses may increase nurse-led tobacco cessation interventions.

Design Considerations for West Texas Aquaponics Systems

Francisco Teran

Aquaponics is a modern agricultural production practice applications that can be applied in many forms across a wide range of environments both rural and urban. The practice is a combination of freshwater aquaculture and hydroponic vegetable production. Recirculating aquaponics systems, utilize the hydroponics system to continuously mechanically and biologically treat the water from the aquaculture system. To maintain a healthy and productive production system

animal and plant systems must be balanced. The balancing of the system can also include additional mechanical and biological water treatment process to maintain water quality. Monitoring the system's dissolved oxygen concentration, nutrient concentrations, electrical conductivity, suspended solids, pH and temperature provides the basic operational parameters for a health system. The goal of an engineered aquaponics system is to provide a continuously operational system that can be operated economically and sustainably. By using a closed loop mass balance approach to the design the inputs; feed, electricity, water, seed, and fish fingerlings balanced with the outputs; fish, vegetables, water losses, heat generation, and waste products. Each of the inputs and outputs can be quantified and given monetary value. One of the most difficult of these is water. Evaluating the real value of water is often difficult. In the design process for the aquaponics system the comparison value is not so much the cost of water by the amount of water per pound of food which then can be compared to more traditional cropping systems. The long term goal of researching aquaponics is to determine if and where this practice can be implemented as an sustainable and economical alternative food production system.

Session A4: Teaching and Learning - LYNAY Classroom

Effectiveness of Speech Therapy Utilizing Music for the Development of Specific Communication Skills in Children with Autism
Christina Wise

An estimated 1 in 68 children have a diagnosis of autism spectrum disorder (ASD). Because language, communication, and social skills deficits are among the defining characteristics of ASDs, professionals and caregivers are seeking the best intervention strategies to help these individuals communicate as effectively as possible. Using music in speech therapy has become an increasingly popular tool for the treatment of communication disorders for those with ASDs. Although the use of music in speech therapy in the treatment of social skills disorders is a relatively novel concept, its use has proven beneficial with this population. A critical and systematic analysis of seven studies, which investigated the use of music in speech therapy for deficits in joint attention, social skills, and social responsiveness, revealed a broad spectrum of outcomes and ideologies about music as a social skills intervention instrument. Results of the present study are indicative of the fact that using music as a therapy tool for specific communication skills needs to continuously be explored and researched in a variety of populations exhibiting ASDs.

Choice is a tricky thing: Learning to choose in an uncertain world
Allison Phillips

Introduction

Decision-making has traditionally been studied using two paradigms: the descriptive paradigm, in which decision-makers receive information describing available options and their possible outcomes, and the experiential paradigm, in which participants learn payoffs through trial-to-trial experience. Because of these methodological differences, results differ and contrasting theories have emerged. Tversky (1972) proved that "simple scalable models" must satisfy several principles that people reliably violate (Rieskamp, Busemeyer, & Mellers, 2006). However, while decision theorists have worked within the description-based paradigm to develop more sophisticated choice behavior models, they have ignored the issue of learning.

Choice models within the experiential paradigm require a learning mechanism and a choice mechanism, so the effects of learning yield dramatic differences between the paradigms. This difference renders theories developed in the descriptive paradigm ineffective in the experiential

paradigm (Barron & Erev, 2003; Jessup, Bishara, & Busemeyer, 2008). To bridge this discrepancy, a learning version of decision field theory was recently developed (DFT; Busemeyer & Townsend, 1993). This experiment combined elements of both paradigms to test which model could best fit the data: DFT (descriptive paradigm), reinforcement learning (experiential paradigm), or DFT with learning (new model).

Method

Participants completed 300 trials of a decision-making task, choosing between two options in which they knew the possible outcomes but not their probabilities of occurrence. After each decision, participants learned how much money they had earned from their choices. One option stochastically dominated the other, meaning that there was a clear “better” option. Participants encountered two conditions: in the positive condition, payoffs between the options positively correlated and in the negative condition they negatively correlated. The expected values were equal between conditions. Choices were analyzed using a 2x2 repeated measures ANOVA, with condition (positive or negative) and block (first or last) as the factors. Diederich and Busemeyer (1999) demonstrated that DFT but not simple scalable choice models can accurately predict increased violations of stochastic dominance when payoffs are negatively rather than positively correlated. Consequently, a significant main effect of payoff condition would indicate support for the two DFT models. A significant main effect of block would indicate support for the two learning models. Two significant main effects – or a significant interaction – would support only DFT with learning.

Results

Repeated measures analyses yielded multiple significant effects, including payoff condition ($F(1,19)=10.57, p<.05$), block ($F(1,19)=3.57, p<.05$), and their interaction ($F(1,19)=18.97, p<.05$). Mean purchasing for the dominant option when payoffs were positively correlated was 0.61 (first block) and 0.92 (last block) and when negatively correlated 0.63 (first block) and 0.57 (last block).

Discussion

Ultimately, neither traditional reinforcement learning models nor DFT without learning can effectively explain this type of choice behavior. DFT with learning is the only model that can effectively predict all observed effects.

Politics in Eurovision Song Contest?

Richard Elmore

The Eurovision Song Contest was created by the European Broadcasting Union in 1956 with the purpose of bringing together a continent torn apart by the Second World War. Participant countries within the EBU participate in the contest by submitting one song for performance. On the day of the contest, following the performance of each qualifying nation’s song, countries proceed to cast votes for other countries’ songs. The issue of “bloc voting,” where countries with interlinked history and culture vote for each other, rather than voting on the basis of merit, is widespread and has been well studied. Despite the purpose of ESC being to transcend politics and connect the continent through music, this song contest has come to reflect the political and social complexities of Europe and its broadcasting union. Notable examples include the public opposition to Azerbaijan hosting the 2012 ESC as a result of its human rights violations and conflicts with Armenia, in addition to the former Soviet Republics’ recent history of political statements - usually targeted at Russia - through song messages and representatives at ESC. This research analyzes the voting trends and patterns as a result of such political issues, in addition to

public reaction and reception, and the politically-inspired entries and messages made by each participating nation.

Session A5: Health and Wellness – AT&T Theater

A Comparative Analysis of Satisfaction Among Post Hospital Birth and Non-Hospital Birth Mothers

Christina Brown

Background/Specific Aim: Numerous women debate the topic of whether it is healthier to have a hospital or a non-hospital birth. The research conducted on this topic should determine if a hospital or a home birth is healthier based on the happiness and comfort of the mother after giving birth in those settings. This study aims to identify the factors of satisfaction among post hospital birth and non-hospital birth mothers as well as identifying the levels of satisfaction among those mothers. Methods: This was a quantitative, non-experimental, exploratory study that utilizes a standardized measure. The sample that was used was of 121 women who responded to the survey who had given birth within the last five years. The survey used was the Birth Satisfaction Scale and was distributed using a snowball method online via Facebook and e-mail. The tools used to collect and analyze the data were Google Forms and SPSS. A T-test and a One-Way ANOVA were used within SPSS to fully understand the data collected. Results: There were 121 total responses, with only 111 usable/completed surveys. On average, most women had given birth in 2013 at the time of this survey. At a significance level of $p = .05$ it was found that non-hospital birth mothers were significantly more satisfied with their birthing experiences. The mean satisfaction scores for hospital birth mothers were 60.20%, and 62.92% for non-hospital birth mothers. Narrative comments from participants yielded consistent themes as that of the current literature, such as control, support, safety and better outcomes, and lack of intervention. Discussion: The results of this study line up with the results of other studies concerned with addressing the overall satisfaction women have with childbirth, whether hospital or non-hospital. The results also show that the satisfaction of the mother in either setting is not adequate. While non-hospital birth mothers were still more satisfied on average than hospital birth mothers, they were only satisfied at 62 percent. Physicians and midwives should make it their goal that their patients are fully satisfied with their birth so that they feel safe and better prepared to give birth. Support, control, and PPD all played a role in the satisfaction scores of the women in this study, which is backed by other studies as well. Conclusion: Birth satisfaction among post-birth mothers is a critical issue that needs to be addressed. While non-hospital birth mothers are significantly more satisfied than hospital birth mothers, the fact that both groups are only 60 percent satisfied on average is alarming. Finding ways to make birth a more satisfying experience for the mother could be conducive to a healthier mother.

Are Wellness Programs Beneficial for the Workplace?

— John Daily

Controversy of Economic, Religious and Domestic Slum Life in Dharavi, India

Kelsey Kotara

According to Cities Alliance, around one-third of the urban population in developing countries lives in slums.

The presence of slums in third world countries is a topic that involves multiple factors, which must be considered. How did individual slums come to be? What issues concerning poverty are present in slums? Are residents within slums giving back to their community? A cycle seems to

exist within and around many of these “neighborhoods” that prevents residents living in them from finding more prosperous opportunities outside the slum, and slum populations are even growing.

I chose to narrow my research on slums in on the Dharavi slum in India. Dharavi is home to more than 1 million people and is located in the center of Mumbai.

The cultural tradition of the caste system, the poor infrastructure within Dharavi and the lack of access to necessary sanitation, are all issues I will be touching on in my paper. I will give some insight into the economy of Mumbai and in it’s inner city by analyzing current residents and their jobs in Dharavi.

More attention needs to be given to this part of the world and to this group of people that desperately need changes to take place. Human rights are necessary for everyone and there is no exception among the lives of those in Dharavi, India.

My knowledge of entrepreneurial success and my passion for speaking up about human rights will contribute to the message in this paper. I will include references from those such as world-renown scholar Amartya Sen, as well as multiple scholarly journals and powerful articles from Time Magazine and the British Broadcasting Company.

Session A6: Cultural Concerns – McCaleb Room Zone C

Cultural Awareness in Study Abroad

Annie Bailey

With the greater accessibility, interest, and growth in Study Abroad, it has become imperative to investigate the impact that studying abroad in a foreign country makes on student participants and their understanding of the cultures they encounter during and after their travels. As a participant in ACU’s Study Abroad Program in the fall semester of 2014, the researcher became curious about the subject of the influence intercultural competence has over the experience as a whole. The researcher conducted an investigation with ACU students studying abroad in order to determine whether or not they felt more interculturally competent after living and studying in a foreign country for one semester. This study used a survey to examine attitudes and feelings about students’ home culture as compared to the cultures that they explored in their international travels. Results suggested that, overall, students found that they were able to look at US culture more critically, and after returning to the US, they had gained a more informed perspective of the world.

Tolerance in Toledo, Spain between Muslims, Christians, and Jews in 711-1031

Kendra Oregon

This paper discusses the tolerance exhibited in Toledo, Spain from 711-1031 a time where Muslims, Christians, and Jews were living amongst themselves in a state of tolerance that led to immense prosperity economically and culturally. In order to fully grasp the concept of tolerance throughout the span of these years the areas of focus were: the willingness to partake in the different cultures, the role of physical proximity within the walls of Toledo, and the importance of language as it evolved due to the interaction amongst the three groups of people. By understanding the peace that was executed in our past by the most unlikely of neighbors leaves us with a better understanding of what is required to have such a time of tolerance as was seen in Toledo, Spain. Peaceful coexistence is not something that is beyond our reach, the first step is

coming to the realization that peace is not a myth but something that has been done and is being done today.

Conservation or Cultural Dominance?: Ecotourism in the Himalayas
Brooks Mendenhall

Ecotourism is any activity or experience that involves learning, nature, and culture with a focus on sustainability and local economies; mountain climbing, visiting national parks, and hiking are all examples of ecotourism. While it sounds wonderful in theory, in most places ecotourism represents an ideal more than an actuality. The industry of ecotourism in the Himalayas, for example, is not sustainable and it robs local communities of autonomy and traditional ways of life. This is seen clearly through the examination of a variety of secondary sources which assess various aspects of the Himalayan ecotourism industry: waste management, preservation of resources, and exclusion/inclusion of local communities. Two of the intended components of ecotourism are sustainability and promotion of local economy. In its current state in the Himalayas ecotourism is failing in both regards as these secondary sources point out. The solution proposed in this paper is to give autonomy back to local communities and put them in control of the future of their land. Through the examination of historical primary source documents it is evident that these communities have deep religious and cultural ties to the land that are rooted in a sense of place and an understanding of and respect for the power of nature. Locals should be trusted to act on their love of the Himalayas. In fact, local communities are already making efforts to preserve on their own and if given more control they could make their own autonomous decisions about land use and ecotourism.

Tuesday, March 31, 9:30 – 10:50 AM

Session B1: Drama and Music - McCaleb Room Zone A

ACU Theatre Spring 2015 Season Dramaturgy

Diego Gonzalez, Sarah Yarbrough, and Braden Clark

The dramaturgy practicum at ACU Theatre operates with the current seasonal productions to provide comprehensive knowledge and perspective on the elements of a play—playwright, time period, location, historical/cultural background, thematic elements, and pertinent research—to connect the production team of directors, designers, and cast members with the heart of a play. This task aids the overall execution of a production by revealing truth, meaning, and encouraging cast members to dive fully into the world of the story. Our research includes the ACU Theatre winter and spring 2015 productions: *The Marvelous Wonderettes* (directed by Dawne Meeks), *V is for Violin* (directed by junior Directing major David Porter), and *Ghost: The Musical* (directed by Adam Hester). *Wonderettes* invites you to a High School prom and introduces the song leader squad girls who are on the search for big dreams and love, featuring ‘50s and 60’s hit songs such as “Lollipop,” “Stupid Cupid,” “It’s my Party” and many more. *V is for Violin* delves into the topics of photojournalism ethics and the human struggles of guilt and PTSD through the story of 1994 Pulitzer Prize winning photographer Kevin Carter. *Ghost* relates the popular Oscar-winning 90’s movie about the power of love through a new musical interpretation. Our research will also be utilized as we command talkbacks following the performances, which will reach out to connect the cast and crew to the audience and discuss thoughts on the productions. We will include our research and findings during the talkbacks in a poster and digital format presentation.

Change You Fate: A Rhetorical Analysis of Disney's Pixar's Brave
Allison White

Disney Pixar's 2012 film *Brave* tells the tale of "mothers and daughters, [and] the battles they fight, both against each other and united together." The close relationship between Elinor and Merida developed throughout the movie is one of the tightest parent/child bonds Disney has created, leading many audience members to consider the importance of relationships between mothers and daughters. In light of this development, this paper addresses the question: How do rhetors use children's movies to argue that family relationships are strongest when the family accepts each individual's true identity? My analysis uses fantasy themes, visual symbols, parallel imagery, and public memory to draw two conclusions. First, Chapman uses family relationships to show children they do not have to follow the status quo, but can dance to their own beat. And secondly, the bond between Merida and Elinor illustrates that accepting each individual's true identity is essential to forming strong family ties.

An Examination of Gender Roles and Suicide in Shakespeare's Plays
Alyssa Johnson

This research paper is a qualitative analysis of Shakespeare's subversion of traditional gender roles in the suicides of many of his main characters. In his plays, he often shows a link between death and love, and there is an even deeper connection between these deaths and traditional gender roles. In his lovers especially, Shakespeare utilizes differing methods of suicide and character understandings of suicide to depict female characters such as Cleopatra or Juliet as powerful and masculine and to show some of his male characters such as Antony or Hamlet as effeminate. Although many think of Shakespeare's plays as sexist, a deeper analysis of these characters shows that in the worlds he created, gender was not the only defining quality a person had. I used intensive readings of the plays *Romeo and Juliet*, *Antony and Cleopatra*, and *Hamlet* aided with Julia Kristeva's essay, "On the Melancholic Imaginary," to analyze these characters in the contexts of their respective plays and to understand them on a psychological level to better understand their motivations for suicide and whether or not these motivations are linked to their genders. I examined in depth the title characters in *Romeo and Juliet*, looking at the inevitability of their suicides and contrasting Juliet's more traditionally masculine suicide with Rome's effeminate one. I analyzed the title characters in *Antony and Cleopatra* as well, noting that again Shakespeare uses their approaches to suicide to show Antony as an effeminate character contrasted with Cleopatra as a masculine, powerful one. Here, like in *Romeo and Juliet*, the characters are motivated in part by their love for one another, but Shakespeare takes the inversion of gender roles further by having Antony completely fail in dispatching of himself. The third play I used in my analysis is *Hamlet*, taking an in-depth look at the suicidal ideologies of Hamlet and Ophelia. Hamlet dwells on suicide almost constantly in the beginning of the play, but he lacks the guts to go through with it. Ophelia, on the other hand, hears him speaking of suicide and eventually goes through with it after he has planted the seeds of doubt in her mind. Her chosen method of suicide drowning is not sexually charged like the deaths of Juliet or Cleopatra, but it leads to how dishonorable (and feminine) her suicide is considered, which contrasts with the earlier plays. Shakespeare inverts traditional gender roles throughout these plays, and through the suicides of major characters he shows that even in death, gender roles are not fixed.

A Comparison and Analysis of "Come away, death" from Twelfth Night as set to music by Roger Quilter and Gerald Finzi
Marc Gutierrez

The lecture recital focuses on an analysis and comparison of Come away, death from Twelfth Night as set to music by Roger Quilter and Gerald Finzi. Shakespeare's poetry is discussed from the perspective of setting it to music. I discuss why it is a good candidate to set to music by identifying the significance of different words and symbols in the poetry. Next, I thoroughly discuss my analysis of Roger Quilter's musical setting by highlighting the musical choices made by the composer. These include rhythmic, melodic and harmonic motivic ideas. I analyze Gerald Finzi's musical setting with the same approach. I focus on similarities and differences in his treatment of the text. Although both composers are using the same set of symbols, they yield different successful works of art. After the discussion of the complete analysis of each song, I will then perform them as a reflection of my research. This enables the audience to have the full experience and enjoyment of hearing the research in the context of a performance.

Session B2: Biology Cluster: Aeromonas, Mammals, and More - McCaleb Room Zone B

Inhibition of ER Ca²⁺ release or the p38 SAPK inhibits UPR signaling and apoptosis activation during moderate ER stress
Tina Johnson

When unfolded proteins accumulate in the endoplasmic reticulum (ER), stress signaling pathways collectively called the Unfolded Protein Response (UPR) are induced. Modeling of ER stress in cultured cells is often performed with high doses of poisons that arrest essential functions within the ER. In examining the potential implications of chronic ER stress signaling in organismal models, a modest ER stress would be anticipated as clinically appropriate. In this study, the ER was challenged with a 50-fold range of tunicamycin, an inhibitor of N-linked glycosylation. Tunicamycin induced cellular apoptosis and stress signaling over a range of concentrations from 20 nM to 1000 nM. Increasing doses of tunicamycin resulted in similar increases in activation of signaling from the ER-localized IRE1 transmembrane protein, expression of UPR transcriptional targets, and activation of the p38 stress activated protein kinase. High doses of tunicamycin were shown to cause an elevation in cytosolic Ca²⁺, while modest doses showed no significant changes in cytosolic Ca²⁺ levels. Interestingly, inhibition of Ca²⁺ release from the inositol triphosphate receptor was found to inhibit ER stress signaling and apoptosis only at modest doses of ER stress (20-40 nM). During moderate ER stress, p38 inhibition was sufficient to inhibit UPR-based increases of GRP78 expression and the activation of cellular apoptosis. This work supports a model in which moderate ER stress uses Ca²⁺ release and p38 signaling as a central component of both UPR activation and a subsequent ER stress-induced apoptosis

Isolating Aeromonas from Precipitation and the Atmosphere
Kathryn Preston

Background/Specific Aim: Aeromonas is a ubiquitous, Gram-negative, rod-shaped, oxidase-positive anaerobe. Members of this genus can cause disease in fish and other cold-blooded species. Aeromonads are also emerging pathogens associated with extra-intestinal infections in humans after coming into contact with or consuming contaminated water or food. Though there are various biological particles that are known to be in the atmosphere, microbial communities are poorly characterized at high altitudes and in air masses over marine/oceanic regions. Bacteria have the ability to remain suspended in the air for prolonged periods of time and transmit

diseases through both aerosolized “airborne” and “droplet” means. It is important to study *Aeromonas* and how it moves throughout the environment.

Methods: Various precipitation samples were taken in Abilene, TX with a sterile sampling jar and plated onto *Aeromonas* blue medium plates with and without ampicillin. Colonies were subcultured onto plates and then tested for the presence of oxidase. 16S rRNA DNA sequences were amplified from oxidase-positive gram-negative rods then sequenced at Yale DNA analysis facility. After receiving results, sequences were analyzed using two online databases: NCBI BLAST and RDP.

Results: The study began with 34 purified PCR products, and 28 samples were sent to Yale to be sequenced. After analyzing the sequences of the 28 samples, only 26 of the samples had usable sequences. Among 26 usable sequences, no samples appeared to belong to the genus *Aeromonas*. There were various other bacteria found among the samples.

Discussion: There are many reasons why *Aeromonas* was not found in the samples: 1) the lack of a proximal lake or stream as an initial source of *Aeromonas* prevents detection of these types of cells, 2) *Aeromonas* may not be able to survive in the atmospheric or wind conditions of the study, 3) *Aeromonas* may be present in the precipitation but the methods were not sensitive enough to detect them, and 4) the genus may not be present at all in precipitation.

Conclusion: Though *Aeromonas* was not found, many other genera of rod-shaped bacteria were. Future research for this study include expanding the collection site to sites near aquatic environments and other areas outside of Texas, collecting different forms of precipitation and at different seasons of the year.

The purpose of my project is to make collections of various forms of precipitation (e.g. rainwater and snow) and attempt to isolate *Aeromonas* through the use of *Aeromonas* blue media with and without ampicillin. By isolating *Aeromonas* from precipitation, I will be able to investigate how *Aeromonas* moves throughout the atmosphere.

Determining the effect of clpA in the Natural Transformation ability of Aeromonas salmonicida
Kristen Clemons

The genus *Aeromonas* is ubiquitous in water and can be identified as Gram negative, rod-shaped, facultatively anaerobic bacteria. These bacteria are opportunistic extraintestinal and intrainestinal pathogens that can cause disease year-round with varying severity.

Aeromonas salmonicida is a naturally transformable species. Natural transformation is a six-part process that results in a bacterium incorporating free DNA into its genome. It is possible that aeromonads can become antibiotic resistant through this mechanism.

The proteolytic molecular chaperone ClpA has been indicated as affecting the natural transformation process in the genus *Aeromonas*. In this investigation, the effect of ClpA on the natural transformation ability of *Aeromonas* was studied through the creation of a *clpA* mutant fragment in which *clpA* was replaced with a gentamycin resistance cassette. This fragment was assembled by using PCR and SOE-PCR.

Having constructed the mutant fragment, the project is now focusing on the gene replacement in the wild-type *Aeromonas* with the intention of making a comparison between the wild-type and mutant strains which will enable the determination of the effect of ClpA on the natural transformation ability of *Aeromonas salmonicida*.

In July and August of 2014, a mammal survey was conducted in an ecotone region (including páramo and temperate forest) on the Eastern Versant of the Andes in Carchi Province, Ecuador. Sherman traps, Tomahawk traps, pitfall traps, and mist nets were used to collect mammal specimens at two sites (3,340 m elevation and 3,650 m elevation). A total of 142 specimens representing 14 species were collected from the survey area. The species collected include: *Didelphis pernigra*, *Microrhizomys altissimus*, *M. minutus*, *Nephelomys albigularis*, *Neusticomys monticolus*, *Reithrodontomys soderstromi*, *Thomasomys baeops*, *T. cinnameus*, *T. rhoadsi*, *T. ucucha*, *Sturnira bidens*, *S. bogotensis*, and a *Myotis* species. One additional species (*Mazama rufina*) was salvaged as a partial skull only from the forest near the biological station. A comparison of effect of elevation on Ecuadorian rodents can be made by looking at past studies. These studies reveal an ecological gradient and turnover of Cricetid rodent diversity (at the taxonomic level of tribe) that occurs between 2,070 m and 2,500 m.

Patterns of D-Loop Sequence Variation in Thomasomys (RODENTIA: CRICETIDAE)
John Iragena, Nathan Dougherty, and Amberly Grothe

Thomasomys is a genus of 30 – 40 rodent species distributed primarily in northwestern South America. Previous investigations based on the mitochondrial cytochrome b gene and the nuclear RAG1 gene provided well resolved nodes at the species level. In contrast, most deep nodes joining multiple species had short branches and low bootstrap values, suggesting a rapid radiation early in the diversification of *Thomasomys*. Furthermore, these data resulted in reconstructions that rendered one common species, *T. baeops*, paraphyletic with respect to the more narrowly distributed Peruvian species: *T. taczanowskii*. In order to further test these hypotheses, we have obtained sequences from the noncoding mitochondrial D-loop region. We extracted DNA and performed PCR to amplify the D-loop using the L0702 and H0702 primers. We quantified DNA from PCR products, sent samples to be sequenced, and edited and aligned sequences using Sequencher 5.2.4 and SE-AL v2.0. Early results suggest that the D-loop is highly variable. Due to substantial length polymorphism, D-loop sequences have proven difficult to compare across species but may provide informative characters to resolve species boundaries

Session B3: SeaQuest and COMPASS – Alumni Conference Room

The monitoring of environmental conditions for SeaQuest
Zhaojia Xi

The SeaQuest/E906 experiment uses the 120 GeV Main Injector at Fermi National Accelerator Lab (FNAL) is to measure the quark and antiquark structure of the nucleon using Drell-Yan scattering. The spectrometer acceptance emphasizes valence quarks in the beam protons annihilating with anti-quarks in the hydrogen, deuterium and heavy nuclear targets. The SeaQuest spectrometer was built in the New Muon 4 (NM4) Hall, which can have 5-7 degrees C temperature gradients and humidity gradients between the bottom and top of the detectors. These gradients can affect detector performance. Thus conditions in the NM4 area such as pressure, humidity and temperature need to be monitored since they can impact detector performance and high voltage leakage currents. The system developed to record these data has the capability to be

checked independently of the rest of the slow control system, allowing for studies independent of the main data acquisition system. The setup, programming, and expandability of this system will be presented.

SeaQuest / E906 Shift Alarm System

Noah Kitts

SeaQuest is an experiment at Fermilab, located near Chicago Illinois. It is a fixed target experiment whose main purpose is to learn more about what is inside the proton. The continuously running experiment is always being monitored. Those on shift must keep track of all of the detector readouts in order to make sure the experiment is running correctly. As an experiment that is still in its early stages of running, an alarm system for people on shift is being created to provide warnings, such as a plot showing a detector's performance is sufficiently different to need attention. This plan involves programs that track live data. When the data shows a problem within the experiment, a corresponding alarm ID is sent to a database which then sets off an alarm. These alarms, which will alert the person on shift through both an audible and visual response, are important for ensuring that issues do not go unnoticed, and to help make sure the experiment is recording good data.

Design of Drift Chamber 05 for the COMPASS II experiment

James Mallon

The COMPASS project is a fixed-target nuclear physics experiment at CERN which explores the internal structure of the proton, and COMPASS II's experiments will be exploring the quark angular momentum contribution to the spin of the proton. As a part of this process, Drift Chamber 5 (DC5), based on DC4 built by CEA-Saclay must be constructed to replace an older, faulty straw chamber. The 23 total frames of DC5 have an outside measurement of 2.94m by 2.54m, which is the same as DC4. However, DC5 improves on DC4 in many different ways- while DC4 has a detection area of about 4m², DC5 has an extra 256 wires, giving a total of 4616 >2m-long wires and a detection region of 4.19m². DC5 also has an updated front end electronics setup, using a new pre-amplifier-discriminator chip, in order to allow the recording of more events per second. These updates improve tracking of particles, but have led to interesting challenges, which were solved in varying ways.

Building a new Drift Chamber for COMPASS

Megan Cromis

COMPASS (Common Muon Proton Apparatus for Structure and Spectroscopy) is a nuclear physics experiment at the European supercollider CERN investigating the internal structure of the proton. The origin of the proton spin is still a mystery in the world of physics. Never before conducted experiments at COMPASS will explore how quark movement contributes to the proton spin. In order to make these revolutionary measurements, several of the experiment's malfunctioning straw tubes will be replaced with a state of the art particle detector, Drift Chamber Five.

A drift chamber is a charged particle detector consisting of eight different planes with over 500 wires each. Each of the planes are strung at different angles to provide more precise measurements. Drift Chamber Five was constructed at Old Dominion University's cleanroom in Norfolk, Virginia in collaboration with COMPASS and the University of Illinois. This

presentation will discuss the work environment, building techniques, and the construction of the new chamber.

Wiring the new COMPASS Drift Chamber
Lacey Medlock

COMPASS, a fixed-target experiment at CERN, will examine rare quark-antiquark annihilations that may illuminate how the quark angular momentum contributes to the spin of the proton. A new drift chamber, a tool for measuring the position of charged particles, must be constructed to upgrade the experiment. In order to construct the drift chamber 4616 gold-plated tungsten wires are used, half are 100 micron (field wires) which provide an electrical field and half are 20 micron (sense wires) which measure position. Because of the difference in wire width, two very different stringing techniques had to be developed. The 20 micron sense wire was too fragile and thin to be handled in the same manner as the 100 micron field wire, so different tools had to be used in order to ensure the stability and efficacy of the chamber. Additionally, different soldering techniques had to be used for the two different types of wires to guarantee both that the field wires did not slip out of their solder joints during the process of stringing the sense wires and that both types of wires had smooth, even solder joints that would not require repair. This presentation will detail several aspects of wire stringing, including how to string different widths of wire and how to overcome difficulties arising from using two different types of wire during the stringing process.

Session B4: Perspectives in History and Literature – LYNAY Classroom

The Views of Blood in Renaissance Europe
Adam Lubbers

Medicine in early modern European has been a topic of research for me before, and that research led to discoveries of large-scale cultural cannibalism explained with pharmacological methodology. Their reasoning seemed to be disgustingly logical, and I wanted to see what exactly was causing such bizarre medicinal practices. I looked at mostly sources written by physicians, along with some philosophers and clergymen. Primary sources were quite limited because of the five hundred year gap between now and the Early Modern Era, along with a lack of access to published sources, or a lack of English sources. This led to a slightly heavy reliance on secondary sources commentating on primary sources that could not be accessed. However, there was enough information to create a reliable paper that explores some reasons behind medicinal cannibalism of the Early Modern Era. A combination of the beliefs of the circulation and physiology of blood along with superstitious theology ultimately led to a belief that the soul was flowing throughout the body. Since the time of Galen, many physicians had believed that spirits had been flowing throughout the body with the aid of the blood to provide nourishment to the organs. This belief was passed throughout the ages and combined with Christian theology to create (what I call) the Bloody Soul Theory--which means the soul is moving inside the body through the blood. This theory seems to be a major reason Europeans drank the blood of others to heal themselves.

Milky White Ink and the Black Cloven Hoof: Écriture féminine in Abdellab Taïa's Un mélancolie arabe
Spence Horner

This research paper will address and investigate the essence of the male "écriture feminine" by applying the theoretical paradigms concerning "feminine writing" as presented in the work of Helene Cixous to the work of the gay Moroccan novelist Abdellah Taia, an important emerging voice in French/North African letters. Originally, this paper would provide analysis of Taia's novel "An Arab Melancholy" only, but I would like to extend analysis to his novel "Salvation Army" as well. By comparing and contrasting the essential aspects of Taia and Cixous' work, I wish to furthermore develop my own conclusions which include the notion of "penetration" - the necessary consequence of self-othering as facilitated in authorship. I also want to investigate the contrasts between the white ink of women's writing and the black cloven hoof that marks the Devil in literature. Research methodology consists of critical perspectives on Cixous (especially from Derrida), deep reading of fiction and nonfiction authored by Cixous, deep reading of the fiction of Taia, and the incorporation of other relevant writers including but not limited to Jean Genet, Clarice Lispector, Yukio Mishima, Paul Celan, Heinrich von Kleist, Assia Djebar and Paul Bowles.

Prophet, Poet, or Madman an evaluation of William Blake
Daniel Edwards

So there has been an argument surrounding the poet William Blake for centuries. However, the question of whether or not this eccentric man was actually mad has been lost in contemporary discussion. Using contemporary diagnostic criteria established in the DSM V a psychological evaluation of William Blake's life using biographies, his own works, and letters a new understanding of the man emerges. The findings of my research show that Blake was a man who in all probability did suffer from psychosis but in a truly miraculous fashion, nearly unheard of by modern understanding, his disillusionment with reality did not negatively affect his life or work. This paper and presentation is an evaluation of what Blake called his "fancy" or the driving creative forces of Blake's poetry, art, and epics.

The Boxer Rebellion: A Holistic Approach
David Wall

By the summer of 1900 China's autonomy was at a low. Foreign colonial powers encroached on the Qing Dynasty until it could no longer make a stand against them. Their military had neither the strength nor the manpower to face European military technology. In the face of such oppression the Chinese peasants of the Shandong Province rose up against the colonial invaders in a conflict that would come to be known as the Boxer Rebellion. It was a revolution from the very bottom of society and it took the western powers by surprise. However, the Chinese advantage did not last long and retribution on the Chinese by the colonial powers was swift and harsh.

Many try to frame the history of the Boxer Rebellion from the perspective of a single country, but to do this is to miss out on so much of the nature of the Boxer Rebellion. This paper covers the involvement of Great Britain, Russia, Germany, France, Japan, and the United States along with the Chinese perspective to give a holistic approach. Each of these nations had their own nuanced motivations for their involvement in the Boxer Rebellion. By learning the many perspectives one is able to not only understand China at the turn of the century but also colonialism and the state of international relations as the world approached modernity. Additionally, the concise analysis of these different views brings fresh perspective on the causes

of and the actual conflict of the Boxer Rebellion. Instead of viewing it as a colonial or Asian conflict this paper sees it as a global conflict and treats it as such.

The Boxer Rebellion is significant because of the many nations involved and its place in colonial history. This paper takes encompassing perspective in order to gain a broader yet more nuanced view of the nations and peoples who fought in the Boxer Rebellion.

The Sleeping Giant of Monotheism
Richard Elmore

Chinese natives generally believe monotheism is not suitable for China. To the Middle Kingdom, the ideology is a foreigner and this foreigner is best kept where it belongs: in the Western world. The influence of the two most prevalent systems of belief on Chinese culture - including folk religion and atheism - has been well studied and documented throughout history. However, the influence of monotheism has not been well studied, despite the evidence indicating a widespread monotheistic religious culture in ancient China during the Shang and Zhou Dynasties. This research reveals the evidence of monotheism in ancient China through the study of etymology and historical linguistics, the relationship between the ancient concepts for God: Shàngdi and Tian, in addition to observations from Christian missionaries to China.

Session B5: Law, Politics, and Peacemaking - AT&T Theater

Various Federal Laws and Their Effects on Identity Theft and Data Breaches in the United States
Tyler Salter

Since 2006, the Consumer Sentinel Network report has put identity theft as the leading consumer complaint in the United States (FTC, 2014). According to Javelin Research Strategy, database breaches are one of the main contributors to these thefts. Each individual state has adopted their respective database breach disclosure laws or other identity theft reduction laws, but the federal laws that have been passed in attempt to reduce identity theft can sometimes be overlooked. Now that the U.S. has enacted certain federal legislative approaches to combat not only identity theft, but also data breaches, we look at the crimes more closely. Using data from the U.S. Federal Trade Commission and the Privacy Rights Clearinghouse, this paper will analyze the trends of identity theft complaints and database breaches from 2006-2013.

Keywords: data breach, identity theft

The Effect of Cultures on Management Styles
Judith Morales

This paper looks into the impact that culture has on management styles. It is focused on comparing Latin American countries and the United States, because although they may be close geographically, they are very different cultural wise. It discusses some management and leadership styles and why both are needed in an efficient workplace. Some of these management styles are theory X, theory Y, and different leadership styles. In this paper the reader will gain a better understanding as to how they themselves can apply it to their lives as well as gain a better understanding of other's cultural differences.

The Solid South: Campaign Issue Strategies in the 2014 Southern Senate Races
Caleb Orr

The 2014 senate race was full of speculation on who would win and how campaigns would be run. Which issues would Democrats focus on in order to save their Senate majority? How would Republicans position themselves in order to take control? The proposed research seeks to evaluate the strategies used by both Republicans and Democrats in contested senate seats in five Southern states. The campaigns analyzed took place in Georgia, Arkansas, Louisiana, North Carolina and Kentucky. A quantitative content analysis of campaign materials put out by the candidates official campaign are analyzed for themes of state issues, national issues, distancing from the president, etc. Multiple coders will be used to establish intercoder reliability. Data were collected during the month leading up to the election from the official websites for each candidate. Data include press releases as well as TV commercials posted on the candidates site. Demographic data such as racial composition, partisan composition, and presidential approval rating in the state are also taken into consideration in the analysis.

The Weight of Identity in Peacemaking
Nicole Ramos

Self-perception and identity plays a huge role in mediation and peace building efforts. How one perceives him or herself in dialogue and interaction with the other, both in political and community based conflict resolution, influences the progress, or lack thereof, of realistic and sustainable solutions. In this paper, I will analyze the weight of identity, narratives, and reality in relation to people to people peace building efforts between Israelis and Palestinians. How does each side perceive their social status and role? Are roles, status, and self being influenced, changed, or reinforced? Are strides actually being made towards sustainable peace solutions? I will use as a primary model and case study the well- known and funded Parents Circle-Families Forum, a grassroots organization of Israelis and Palestinians who have lost family members to the violence and who join together in dialogue and community projects. I will also engage the presented work and discourse on the organization with a review of analytical research on how identity and self-perception affects the efficacy of such diplomatic, peace building efforts.

Tuesday, March 31, 12:00 – 12:40 PM

Poster Session I: Hunter Welcome Center Atrium

The Power of "Charge": Lessons in Leadership at the Goodspeed
Lauren Fertig

This study attempts to distinguish between what factors are involved with being hired as a Scenic Artist (a member of the scenic artistic team) and the factors involved with being hired as a Charge Scenic Artist (the leader of said team). There is, of course, a specific, standard skill set necessary for one to be considered "adequate" for hire within the scenic theatrical realm. However, beyond that, there is frequent debate concerning which leadership and painterly skills ought to be required for one to have in order to be hired as a Charge Artist. This study will examine the experiences and opinions of what are considered successful and currently active charge artists and scenic designers. In this, the one universal, conclusive element a Charge must exemplify is the ability to continuously rise to artistic challenges presented to them by the designer. Additionally, this study will take these conclusions and implement them through the creation of various samples of work that are the result of given artistically challenging scenarios within an assigned team of artists. By analyzing the findings of this experiment, this project will

illustrate the necessary skill set a Charge Scenic Artist must have in order to effectively do their job, emphasizing the infectious air of unity a Charge must be able to inspire.

Caught in the Crossfires: The Effect of the Israeli-Palestinian Conflict on the Nations' Children
Bethany Richardson

This research presentation will delve into the Israeli-Palestinian conflict and its' effect on the current generation of children of both Israeli and Palestinian nationalities. The methodology is primarily a literature review and analysis of surveys, news, research articles, and other relevant sources from the past 15 years.

By analyzing research over the past 15 years, my research will show that living in a war-stricken area significantly effects the development of the children involved. The constant fear of attack, the inhuman acts committed by soldiers on both sides of the conflict, and the uprooting of people and relocating on a regular basis all serve as factors in diminishing the development of the children, and putting them at fear for their lives.

The presentation of my research will break down into three categories: education, development, and living conditions. These three subject matters will be compared through both Israeli and Palestinian children. It will give hard numbers for why the conflict is a negative effect on children, and any possible long-term issues that could arise.

The final section of the research will focus on ways that humanitarian and social workers can provide aid to the children involved in this conflict, on each of the three topics mentioned before. The research is still in process, but will be completed by early March.

Social Media Jealousy

Kylie Richter, Alexandra Gartley, BrieAnna Hawkins, and Brandon Clements

Problem

Social media is often used for the purposes of relationship enhancement and maintenance for those in romantic relationships. However, there are temptations here as well. Specifically, social media has created another space where feelings of romantic jealousy can occur as we observe and monitor, often in unhealthy ways, the online interactions of our romantic partners. To date, there has been little empirical work on the phenomenon of social media-related jealousy and its relationship to established measures of romantic trust and jealousy.

Method

Participants were 142 undergraduate and volunteers. The sample was 75.4% female. The mean age was 29.38 (SD = 15.06). The relationship status breakdown was: 43.6% Single, 27.1% In a Romantic Relationship, 29.3% Married.

Participants completed the Multidimensional Jealousy Scale (Pfeiffer & Wong, 1989), which assesses behavioral (e.g., "I look through X's drawers, handbag, or pockets.") and emotional jealousy (e.g., "I get very upset when X hugs and kisses someone of the opposite sex."), and the Trust Inventory Scale (Adams, Couch, & Jones 1996). Participants also completed the Rosenberg Self-Esteem Scale (Rosenberg, 1965). Finally, the participants completed the Social Media Jealousy Scale (SMJS), an eight-item scale developed for this research. Example items of the SMJS included "I get upset when my partner is looking at or interacting on social media with somebody I think he/she might be attracted to" and "I frequently look at my partner's social media accounts to see who he/she has been talking to".

Results

Overall, unmarried participants reported greater ($p < .05$) jealousy ($M = 49.91$, $SD = 9.55$) and social media jealousy ($M = 23.03$, $SD = 7.35$) when compared to the married participants (jealousy $M = 41.58$, $SD = 9.72$; social media jealousy $M = 17.51$, $SD = 6.14$).

Among romantically involved but unmarried participants social media jealousy was positively correlated with jealousy ($r = .72$, $p < .01$), negatively correlated with trust ($r = -.64$, $p < .01$) and negatively correlated with self-esteem ($r = -.65$, $p < .01$). These associations were also observed among the married participants: social media jealousy was positively correlated with jealousy ($r = .62$, $p < .01$), negatively correlated with trust ($r = -.53$, $p < .01$) and negatively correlated with self-esteem ($r = -.38$, $p < .05$).

Conclusions

Overall, among both married and romantically involved participants, jealousy was positively associated with jealousy on social media. Lack of trust in a relationship was also associated with increased ratings of social media jealousy. Self-esteem was negatively associated with social media jealousy. Finally, social media jealousy (and jealousy generally) was higher among romantically involved but unmarried participants, suggesting that jealousy may be most acute in the early stages of romantic relationships where longer-term commitments are tentative and provisional.

This Avoidance is Stressing Me Out! How Avoidance Contributes to Test Anxiety in a College Population

Hannah Anderson, Mackenzie Harrington, and Morgan Watten

Introduction and Problem

It is widely accepted that test anxiety has a negative impact on academic performance (Hembree, 1988). Zeidner's (1998) leading theory about how test anxiety is maintained has purported that it is the behavioral and physiological responses during testing which result in poor outcomes (Tse and Pu, 2008). Cognitive factors such as worry and rumination have shown to be involved in maintaining test anxiety (Sparfeldt, Rost, Baumeister, & Christ, 2013). However, recent research suggests that avoidance plays a key role in sustaining the negative behaviors caused by test anxiety. Ottenbreit and Dobson (2004) broadly define avoidance as refraining from an action as a defensive response involving the ignoring, distorting, or escaping from stimuli that are considered to be threatening (Stemmet, Roger, Kuntz, & Borrill, 2014). In fact, increased use of avoidance as a coping mechanism predicts higher levels of test anxiety and lower levels of performance (Cohen, Ben-Zur, & Rosenfeld, 2008). This study examines the role of avoidance in test anxiety. Our aim is to study the factors that maintain test anxiety in order to reduce the debilitating effects on students. Our hypothesis was that high levels of avoidance would be associated with high levels of test anxiety.

Method

Two instruments were developed to measure both test anxiety and avoidance in a college population with author developed scales which demonstrated excellent reliability, Cronbach's $\alpha = 0.93$ (Test Anxiety); Cronbach's $\alpha = .90$ (Avoidance). Additionally, adapted versions of the mental and behavioral disengagement sub-scales of the COPE scale (Carver, Scheier, & Weintraub, 1989) were used. Participants were 195 college students. The sample was 73.3% female. Classification of the participants was 9.2% Freshmen, 26.7% Sophomore, 29.7% Junior, 22.6% Senior, and 5.6% Graduate. Ethnicity was 79% White, 32% diverse ethnicities.

Results

The hypothesis that high levels of test anxiety would correlate with high levels of avoidance was supported ($r = .409, p < .01$). Mean results suggest that women experience greater amounts of test anxiety ($M = 55.37$) than men ($M = 47.82$). Also, means were greatest for freshmen ($M = 60.44$) and went down for sophomores and juniors ($M = 52.80, M = 50.39$, respectively), but rose again for the seniors in our sample ($M = 54.95$).

Conclusion

These results confirm that avoidance is a contributor to test anxiety. This is important because avoidance can be studied independently from the cognitive factors. This study is limited in that the sample was largely female students from the same university. Additionally, the survey was distributed online. Future studies should examine treatment for test anxiety where the avoidance factor is addressed. Further, understanding that avoidance is a maintaining factor of test anxiety can serve to guide education and treatment in university settings.

Child Life Specialist Impact on Family Stress Resilience: A Parent's Perspective
Katie Bell

A child life specialist is an advocate for children and families in hospital settings. Their role is to utilize play to encourage developmental growth of hospitalized children. They also educate children and their families in order to bring the familial unit together as partners in the healthcare experience. These programs strive to promote patient- and family-centered care. This is not only used for hospitalized children, but can also be used to help children with ill siblings or parents. The need to better serve families has been addressed by child life, but now the need for research in this field has also occurred. Since the inception of the child life profession over the past 40-50 years, there has been a limited number of research studies focusing on the field. LeBlanc, Naugler, Morrison, Parker, and Chambers (2014) recently conducted a study on parental perceptions of child life specialists and found that 86.7% had no previous knowledge of child life specialists or their roles, but after the parents' experience with a child life specialist, 85-99% were highly satisfied with the interventions received. Based on research, child life specialists provide a great service to hospitalized children, but there is a need to further the work and increase awareness of their services.

This study aims to fill a void in current research on how parents believe child life specialists aid in stress resiliency, and how they aid the whole familial unit, rather than simply the child. The purpose of this qualitative study is to explore how parents perceive child life specialists impacting family stress resilience as they face medical stressors associated with their children. The phenomenological study will be guided by the primary question: What impact do child life specialists have on family stress resilience, as told from the perspective of parents with children experiencing medical events? Through interviews of parents who have experienced child life services, this study will contribute to the limited research on the parents' perspective of the value of child life specialists, specifically related to strengthening family stress resilience; and promote rationale for hospital funding of child life programs through this study's evidence of the value child life specialists have in strengthening family stress resilience. This project is unique in that it records child life experiences from a parental perspective and combines research on benefits of child life and experiences of families. The evidence found in this research can be used by hospitals to advocate for child life funding. By this study seeking to provide additional evidence that child life specialists provide a service that parents value, hospitals can see the value in supporting and funding child life programs.

Shame is universal, however the causes and expressions of this emotion vary between individuals. This study sought to explore the various causes and expressions of shame as affected by mental disorders and history of abuse. Hypotheses included: (1) Individuals who report a history of physical, verbal/emotional, or sexual abuse will express higher levels of shame than those who do not; and (2) individuals who report receiving an official diagnosis of a mental health problem by a mental health professional, counselor, or doctor will express higher levels of shame than those who do not.

Method

An author-developed survey ($n=854$) was used to measure shame in those who report a mental health issue compared to those who do not. There were 160 students from a medium-sized, private religiously affiliated-university who participated in this survey. 89 % of participants were female. Classification of participants were 7 % Freshman, 25 % Sophomore, 27 % Junior, 21 % Senior, 3 % Second Year Senior, 6 % Graduate Student, 2 % not currently a student. Ethnicity was 81 % Caucasian, 14 % Hispanic/Latino, 4% African American, and 7% "other". Participants were offered extra credit as an incentive.

Results

There was a positive correlation between shame and emotional abuse $r(160) = .236, p > .01$, as well as between shame and sexual abuse $r(160) = .218, p > .01$, as predicted. Respondents who reported no abuse showed a negative correlation with shame $r(160) = -.217, p > .01$, which supports the hypothesis that when there is a lack of abuse, there is less shame. Emotional and physical abuse were positively correlated $r(160) = .252, p > .01$, while emotional and sexual abuse were also positively correlated $r(160) = .189, p < .01$. However, those who reported a mental health diagnosis had a negative correlation with shame $r(160) = -.190, p > .05$, which was opposite than predicted.

Discussion

The fact that shame and emotional and sexual abuse are correlated has implications for the treatment of those who have experienced abuse. Additionally, the diagnosis of a mental illness and shame are negatively correlated raising the question of whether or not this is because of treatment or something else. While it was hypothesized shame to be associated with the diagnosis of a mental illness, it is possible that certain therapeutic or prescriptive treatments may be the cause of this negative correlation. Future studies should focus on broadening demographics and determining treatment type for the reported mental illness. Finally, a study more focused on measuring treatment would be important to further understanding the construct of shame within relationships.

Ever since the formation of the Jewish state in 1948, there has been a constant conflict between Israel and Islamic nations, which has included several wars. On a broader scale, water has been a central motivator of conflict throughout history. From November 1964 to May 1967, Syria and Lebanon engaged in an armed-conflict over the Jordan River drainage basin. Recently, water has been used to achieve peace in the region. For example, in December 2013, Israel, Jordan and Palestinian governments signed a history water deal in order to establish desalination plants and

water trading in the region. Therefore, our group has set out to research the risks and rewards of using water as a tool for the ongoing conflicts between Israel and its Islamic neighbors. At a closer look, our team will be analyzing the affects of desalination plants on a nation. This includes how such a plant will affect a nation's economy, environment and political standpoint in the region. Historically, our team wants to know the roots of the conflict between Israel and its Islamic neighbors and how it might affect future deals. This will bring a cultural aspect to our research, which will help us identify underlying issues that could prove to be a detriment to peace. Finally, could water deals be used to gain influence over a nation that could threaten a nation's sovereignty? Ultimately, our group hopes to better identify the possible outcomes that these water deals could form.

Selfies: Evidence of Narcissism, Sociability or Insecurity?
Savannah Hipes

Problem

Ever since cameras became a ubiquitous feature of cellphones and smartphones the “selfie” (a picture you take of yourself when alone) has become a regular feature of social media. Interestingly, many national media outlets have linked the selfie (and the posting of selfies on Facebook, Instagram and Twitter) to the narcissism of Millennials. The selfie is purported to be the quintessential symptom of narcissism in these accounts and the fact that Millennials post so many selfies is taken as evidence of self-absorption. But is narcissism associated with the taking and posting of selfies? The goal of the study was to assess that connection.

Method

Three-hundred and fifty-five participants (71.8% female; Mean age = 26.97; 74.6% Caucasian) completed measures assessing self-esteem, extraversion, excessive reassurance seeking and narcissism. In addition, participants were asked about the frequency of their taking and posting selfies. For example: “On average how many selfies do you post a week?”.

Results

Overall, 67.6% of the sample reported having posted a selfie. The average number of selfies posted per week was 1.45 (SD = 1.24).

Both extraversion ($r = .03$) and narcissism ($r = -.04$) were unrelated to number of selfies posted in a week. By contrast, self-esteem was negatively associated with weekly selfie posting ($r = -.19$, $p < .01$). That is, those with lower self-esteem posted more selfies. Excessive reassurance seeking was also observed to be positively correlated with posting selfies ($r = .13$, $p < .05$).

Conclusion

Overall, posting selfies was not found to be associated with narcissism. In fact, the opposite was observed. Those with lower self-esteem were more likely to post selfies. Excessive reassurance seeking was also predictive of posting selfies. Tentatively, it is concluded that low self-esteem might prompt posting selfies as a means to garner attention on social media (seek reassurances from others) and thus bolster self-concept.

GMOs: Europe vs. North America
Imani Morris, Hannah Carter, and Savannah Johnson

Genetically modified organisms (GMOs) were first seen in European and North American retail stores in 1994. Since their introduction into these continents’ respective food economies, public

opinions and differing views on GMOs between Europeans and North Americans have led to dissimilar government food policies. GMOs are one of the most rigorously tested crops in the world's food economy. This includes the effects of GMOs on health and the environment. The effects of GMOs on the political, economic, and social relations between Europe and North America, however, have not been as rigorously studied. This research will analyze the political differences through studying current and future regulation of GMOs, the economic effects through international trade and trade regulations, and social aspects by analyzing trends in European and North American media.

Assimilation of Chin-Burmese Refugees in the U.S.

Deanna Romero, Rachel Williams, and Nicole Ramos

Topic: Chin-Burmese Refugees.

Primary Question: What assimilation challenges do Chin-Burmese refugees face when resettling in Midland, Texas?

Secondary Questions: What historical, political, and cultural climate exists within Burma and the surrounding refugee camps? What processes do these refugees face when trying to find a new home? What are the major cultural differences between Midland, Texas and the culture of the Chin-Burmese? What are the major hardships do these refugees face when first settling in Midland, Texas? What tools can be given to the Chin-Burmese to help them with assimilation while retaining their dignity and culture? How can we integrate this research into an accessible tool for the International Rescue Committee to immediately use with Chin-Burmese refugees? We are going to approach this research question from three main facets of globalization: Culture, Ideology, and History. By focusing our research in these three areas and conducting participant interviews of Chin-Burmese refugees currently residing in West Texas, we think we can isolate assimilation challenges faced by this specific culture group in a unique setting such as Midland, Texas. These three facets are overlapping while being separate enough to give us a wide scope of how this people group functions, within their own country, within their own communities, within a new country, and in the context of a new home. We think by identifying the main facets of their culture, ideology, and history, and comparing them to those of Midland, Texas, we can create an interactive learning tool that will serve as a cultural orientation to aid in making the assimilation process a smoother transition for these people.

Annotated Source:

Scarlis, Christine A. "Chin Cultural Profile." EthnoMED. University of Washington, 06 June 2010. Web. 27 Jan. 2015.

This article consists of an overall, fairly broad overview of the Chin culture it still allows us to catch a glimpse of what these people are like and how their culture may differ from ours. It talks about the Geography, History/Politics, and language. It talks a lot about the culture of the Chin people, for example, how they name people, greetings, ways of respect towards other people, family construction, and many other topics. Also a lot of the information comes from different interviews, which adds a little bit more depth to our research on the Chin people. The hardest change that the Chin people are going to have to adapt to is the culture of America compared to the Chin culture. The basis of our research is to make them feel connected, informed, and confident enough to go out into America and be accepted into American society.

The Correlation Between Education and Child Marriage in Bangladesh

Kelsey Kotara, Valerie Kocsis, Brooke Crisp, Jill Baker, and Traci Bricka

According to research by the United Nations Children's Fund, 74% of women in Bangladesh between the ages of 20 and 49 were married before the age of 18. The prevalence of child marriage in Bangladesh is a problem because it diminishes the cultural perception, economic standing, physical health, and legislation concerning the rights of Bangladeshi women. When researching this topic through a cultural lens, we will look at the role that religion and tradition play in child marriage and the way women are perceived--devalued and subordinated--by themselves and by men. Through an economic lens, we will research the way this practice dehumanizes women by turning them into economic assets and liabilities, and we will investigate the tradition of dowry as it further encourages child marriage. In the dimension of physical health, we will consider the ways in which child marriage leads to high maternal mortality, malnutrition for both mother and children, and violence against women. In the legal aspect, we will look at legislation that has been proposed to decrease the legal marriage age, which will inevitably decrease the rights of women by extension.

Through all of these dimensions, we will focus our research on the effects of education regarding the issue of child marriage. We will research the ways that a lack of education leads to a greater prevalence of child marriage, as well as the ways in which improved quality, proximity, and access to education can help to eradicate child marriage by improving women's rights. We will propose solutions for the issue of child marriage regarding improvements that can be made to the education of both men and women in Bangladesh. We plan to investigate the ways in which improved education can empower women and alleviate child marriage by preparing women to be economically independent and preparing men and women alike to combat issues like dowry, poor health, abuse, unfair legislation, and overall gender inequality.

Requirement for the SWR1 complex and Nap1 chaperone after TBP association in Saccharomyces cerevisiae

Julia Taylor and Tim Kang

The regulation of gene expression is a complicated process that involves hundreds of proteins. Control of gene expression first occurs at the transcriptional level. Many key players in transcription are necessary for remodeling chromatin, in vivo template of transcription. Chromatin remodeling affects availability of the promoter region as well as the open reading frame to general transcription factors such as TATA Binding Protein (TBP) and RNA polymerase II (RNAPII). At some genes, TBP and RNAPII associate with promoter DNA long before transcription ensues. The mechanisms controlling these "postrecruitment regulated" genes are largely unknown, even though this method of gene regulation is seen across the evolutionary spectrum. Here, our goal was to assess the role of chromatin remodeling proteins in driving transcription at these postrecruitment regulated genes. To identify a potential function of chromatin remodelers in this process, we utilized a plasmid-based screen that tethers TBP to a reporter gene. The screen was performed in *Saccharomyces cerevisiae*, a eukaryotic organism. The screen revealed that removing the Nap1 histone chaperone and proteins that are part of the SWR1 complex results in poor reporter gene activity. Poor reporter activity occurs despite expression of TBP in these strains. Further, poor reporter activity is not due to inappropriate RNA formation, as the start site did not change when these proteins were missing. This indicates that stimulation of transcription after TBP binds is dependent on the Nap1 protein and SWR1

complex, and this dependence is largely specific within the group of chromatin remodelers tested.

*Investigating the Intraspecific Genetic Variation of *Mentzelia hirsutisima* (Loasaceae)*

Abigail Rogers and Angela Adhikari

Mentzelia hirsutisima is an annual wildflower native to far southern California and northwestern Mexico. *Mentzelia hirsutisima* is a member of a small monophyletic group of plants called *Mentzelia* section *Bicuspidaria* that is limited to the southern Mojave Desert and the western Sonoran Desert. Species boundaries in section *Bicuspidaria* have not been thoroughly investigated, and *M. hirsutisima* remains poorly understood in part due to its remote distribution. Preliminary work using chloroplast DNA sequences has suggested that previously unanticipated genetic variation exists in *M. hirsutisima*. In order to thoroughly characterize this species, we gathered herbarium specimens of *M. hirsutisima* representing the entire known range. We extracted DNA and performed PCR to amplify the *ndhF-rpL32* intergenic spacer. We quantified the DNA and sent samples to be sequenced. In this study we compare sequences DNA sequences from *ndhF-rpL32* to investigate patterns of geographic distribution of this genetic variation in order to better understand whether populations previously described as *M. hirsutisima* consist of two or more cryptic species.

An animal biodiversity survey in Runnels County, a preliminary study

Darby Thornton, Leslie Morrell, and Anthony Kocher

Biodiversity is the variation in plants and animals and their interactions with each other. Studying the biodiversity of different bioregions can provide useful information on the relationships between these organisms and how to improve land management to prevent the destruction of species diversity in similar regions. The study, conducted on a ranch in Runnels County, provided knowledge on a variety of species in a previously uninvestigated area. The ranch, located where three different ecosystems converge, includes the Cross Timbers, the Rolling Plains, and the Edwards Plateau. A survey was conducted to identify various animal species inhabiting the area using camera traps, box traps, and visual observation. The results from the survey included the identification of various animal species.

*Reconstructing the Paleoniche of *Prosopis glandulosa* (Honey Mesquite)*

Mike Keenan

With the current struggle land managers face with the control of *Prosopis glandulosa*, it is important to understand where this species has lived (paleoniches), currently lives (niches), and where it has the potential to live in the future. The purpose of this study was to evaluate paleoniches and current niches of *Prosopis glandulosa* to identify areas that will become vulnerable to invasive spread as climate warming trends continue. Current species distribution data was consolidated from various databases, including the Global Biodiversity Information Facility and USDA databases. This data was then compared with current and historical climate data from the WorldClim database. With aid of GIS and species habitat modeling software we were able to make predictions of current and past niches. This comparison revealed a correlation between global warming and expansion of the possible *Prosopis glandulosa* range. Through this study we were able to demonstrate that *Prosopis glandulosa* had a paleoniche range further south during the last glacial maximum. This range has moved north as the climate has become warmer.

Our analysis shows that this range has noticeably continued north since Little's 1970 documented range. The most important finding, however, is that our model shows that there are currently non-invaded areas that possess suitable climate and are, therefore, vulnerable to introduction and spread of *Prosopis glandulosa*.

Pre-Prandial Vinegar Ingestion Improves Two-Hour Glucose Control in Older, Type II Diabetics More Than Post-Prandial Walking

Sarah Taylor

Background: Exercise engagement benefits diabetic patients through an insulin-like effect on muscle. Literature indicates that vinegar consumption may lower blood glucose levels. It is not currently clarified whether pre-prandial vinegar ingestion or post-prandial walking is more effective at controlling glucose in older, Type II diabetics during the acute phase following a meal. **Purpose:** The aim was to directly compare the impact of exercise (15 min of post-prandial walking at a preferred pace) versus ingestion of a relative quantity of vinegar (0.3 g per kg of body weight) on two-hour glucose control. **Methods:** The two arms of the trial were completed in a randomized, crossover manner. Subjects were free of physician-diagnosed damage to the microvasculature and capable of completing exercise safely. Six Type II diabetic patients (Females = 5; Males = 1; Age = 70.5 ± 9.0 yrs.) enrolled and underwent baseline finger pricks to establish glucose levels (measured in duplicate). The test meal consisted of an 85 g bagel, up to 13 g of butter, and 237 mL of orange juice. On the respective days, the vinegar was diluted into 59 mL of orange juice and ingested before the meal or the subject completed a 15-min walk at 15 min post-meal. For both trials, glucose was checked in duplicate every 30 min following the test meal. **Results:** One subject was removed from all present analysis due to medication-related non-compliance. For the vinegar trial, the resting heart rate was $72.0 (\pm 9.5)$ and baseline, 30-, 60-, 90-, and 120-min average blood glucose levels were: $117 (\pm 12)$, $149 (\pm 39)$, $172 (\pm 49)$, $185 (\pm 49)$, and $180 (\pm 44)$ mg/dl. For the preferred walking speed phase, the resting heart rate was $75.5 (\pm 15.6)$ and baseline, 30-, 60-, 90-, and 120-min average glucose levels were: $113 (\pm 10)$, $147 (\pm 53)$, $180 (\pm 53)$, $208 (\pm 72)$, and $206 (\pm 71)$ mg/dl. Preferred walking speed was found to be $3.1 (\pm 1.5)$ kph, total steps were $1418 (\pm 376)$, and average intensity according to percent of predicted maximal HR (utilized $207 - 0.7 * \text{Age}$) was 70% (designated as moderate intensity exercise). The between-arm comparison of glucose at 120-min trended towards significance ($p = 0.081$). **Conclusions:** Compared with a bout of walking, a relative quantity of vinegar may serve as a more suitable mechanism for older Type II diabetics to control acute spikes in glucose after a high carbohydrate meal. With an adequately-powered analysis, between-arm comparisons at multiple time-points would likely have achieved statistical significance. Nevertheless, the meaningfulness of the glucose control exhibited should not be lost due to the lack of statistical significance. Finally, the slow absolute preferred walking pace of many older adults may undermine the ability for walking to result in sufficient energy expenditure capable of subsequent glucose control.

Wire Tension Measurements and Analysis for the New COMPASS Drift Chamber
Vicente Rojas Aguirre

In 2010, the COMPASS experiment, located at the CERN Super Proton Synchrotron, approved the further investigation of the nucleon spin structure. The incorporation of the new drift chamber (DC5) into the COMPASS spectrometer at CERN will facilitate the measurements of trajectories of particles with much improved precision. With an outside measurement of 2.94m by 2.54m, DC5 consists of 8 layers of anode planes and 21 layers of G10 cathode planes. Anode planes are composed of wires oriented in vertical x-direction, horizontal y-direction and $\pm 10^\circ$ from vertical x-direction. Upon assembling the anode planes of DC5 at Old Dominion University (Norfolk, VA), gravitational and electrostatic sag simulations indicated that 20 μm diameter (sense) wires should have a tension of 0.67 N and 100 μm diameter (field) wires a tension of 3.92 N. It was predicted that when a voltage of 1750 V was applied to the field wires, they would be displaced by 135 μm and the sense wires by 85 μm . To avoid further wire displacements that could cause ambiguity in the detected paths, each wire had to be strung at these ideal tensions. Data was collected from more than 3600 wire tension tests. The analysis of these data yielded an improved understanding on the wire tension tendencies. 3% of the wires had to be re-strung given that tension was lost due to friction between the wire and the alignment board. The tension measurement methods, analysis, and results will be presented.

Inspection of anode and field wires for the COMPASS drift chamber, DC5, with Environmental Scanning Electron Microscope
Sonia Cyuzuzo

The COMPASS is an experiment at CERN that uses a secondary pion beam from the Super Proton Synchrotron (SPS) to explore the spin structure of nucleons. A new drift chamber, DC5, will be integrated into the COMPASS spectrometer to replace an aging straw tube detector. DC5 will detect muon pairs from Drell-Yan scattering of a pion-beam off a transversely polarized proton target. This data will be used to determine the correlation between transverse proton spin and the intrinsic transverse momentum of up-quarks inside the proton, the Sivers effect. DC5 is a large area planar drift chamber with 8 layers of anode-frames made of G10 fiberglass-epoxy. The G10 frames support printed circuit boards for soldering 20 μm diameter anode and 100 μm diameter field wires. The anode planes are sandwiched by 13 graphite coated Mylar cathode planes. To ensure a well-functioning of DC5, the wires were carefully tested. An optical inspection and a spectral analysis was performed with an Environmental Scanning Electron Microscope (ESEM) to verify the composition and dimensions and the integrity of the gold plating on the surface of these wires. The spectra of the wires were studied at 10 and 30 keV.

Time-Clamped, RPE-Matched Treadmill Activity and Interactive Video Game Dancing Differ in Step Count But Not Heart Rate Response
Cara Loveland

Background: Task enjoyment is known to promote regular activity engagement. In recent years, participation in interactive video gaming (VGD) has increased and one underlying factor might be enjoyment. Participation in regular moderate or vigorous physical activity (MVPA) results in numerous health benefits. If interactive VGD is capable of meeting the MVPA designation, it could be used as a way to supplement conventional physical activity programs for health purposes. Purpose: The aims of the present investigation were to: 1) determine heart rate (HR)

and step count outcomes of time-clamped and RPE-matched VGD and treadmill activity; 2) characterize the suitability of VGD to achieve MVPA designation; 3) investigate step count outcomes recorded by pedometry and accelerometry. Methods: Subjects underwent three testing sessions with the latter two randomized. During the familiarization visit, the perceived exertion (Borg RPE) of an interactive VGD activity was determined. In addition, a treadmill speed that resulted in an RPE-matched exertion level was identified through incremental increases in treadmill speed. On two subsequent visits, subjects completed 15 minutes of VGD or RPE-matched treadmill activity. HR and step count were measured during both sessions. Results: Nine participants (Age 19.8 ± 1.6 ; 5 males; 4 females) volunteered. With time-clamped and RPE-matched, the average HR for dancing $154.7 (\pm 21.8)$ and treadmill activity $157.8 (\pm 25.1)$ were not different ($p = 0.698$). The selected dances for the VGD activity resulted in 8/9 subjects exercising at MVPA intensity according to percent of predicted maximal HR (threshold of 64% maximal HR; equation: $207 - 0.7 * \text{Age}$). Steps completed during dancing and treadmill activity according to pedometry were $1510 (\pm 488)$ and $2066 (\pm 247)$, respectively, with the difference being significant ($p = 0.001$). Steps completed during dancing and the treadmill activity according to accelerometry were $988 (\pm 256)$ and $1938 (\pm 119)$, respectively, with the difference again significant ($p < 0.001$). The within-mode, between-device step count (pedometer vs. accelerometer, respectively) was also of interest. For dancing, a significant difference ($p < 0.001$) was noted as $1510 (\pm 488)$ vs. $988 (\pm 256)$ steps. For treadmill activity, the disparity between $2066 (\pm 247)$ vs. $1938 (\pm 119)$ was also different ($p = 0.042$). Discussion: The HR response of a VGD activity was not different than a time-clamped, RPE-matched treadmill activity. Furthermore, VGD achieved designation as MVPA intensity in 8/9 subjects with the lone subject failing to achieve moderate designation by a single beat. Of note, objectively determined step count varied by mode and measuring device illustrating the need to employ prudence when selecting measuring technique for step count during rhythmic vs. non-rhythmic PA.

Phylogenetic Species Analyses In Thomasomys (Rodentia : Cricetidae)

Bryan Lim Yew Tian, Ian Gunn, Denise Naude, and Joseph Ayunde

This study incorporates recently sampled taxa into an ongoing study of phylogenetic relationships in the genus *Thomasomys*. New samples from the species *T. baeops*, *T. cinnameus*, *T. rhoadsi*, and *T. ucucha* were collected in the summer of 2014 from the Carchi Province, Ecuador. These were analyzed based on sequences for the mitochondrial cytochrome b (Cytb) gene to test previous taxon descriptions for species of *Thomasomys* and facilitate creation of an updated key for the mammals of Ecuador. We extracted DNA and performed PCR to amplify the Cytb gene using the P484 and P485 primers. We quantified DNA from PCR products, sent samples to be sequenced, and edited and aligned sequences using Sequencher 5.2.4 and SE-AL v2.0. Maximum likelihood (ML) searches will be performed with gaps treated as missing data and each codon position treated as a separate partition in order to test whether currently recognized taxa represent monophyletic species.

The Role of the tapY1 Gene and Natural Transformation in Aeromonas

Christina Lee

Transformation is the ability for a cell to genetically alter its genetic information from the direct uptake and incorporation of exogenous genetic material from its surroundings. *Aeromonas* is a gram negative, rod shaped bacteria that has the ability to naturally transform which accounts for both the gaining and losing of certain characteristics. The tapY1 gene is found within the genome

of *Aeromonas* and encodes for a type IV pili that is believed to have adherence properties that allows the cell to stick to neighboring cells and surfaces. This gene is thought to play a role in natural transformation because it allows the cell to take up DNA. This gene was located within the genome and using primers and polymerase chain reaction, the gene was amplified. This allows for the construction of a mutant strain in which the *tapY1* gene is knocked out and a gentamicin resistant cassette was put in its place. This mutant is currently under construction. When the mutant is successfully obtained, the mutant strain will be tested for differences in natural transformation ability in comparison to the *Aeromonas* wild type containing that *tapY1* gene.

Tuesday, March 31, 12:45 – 1:20 PM

Poster Session II: Hunter Welcome Center Atrium

Biopsychosocial factors impacting positivity and resilience in individuals undergoing cancer treatment

Kaitlin Pegoda

The purpose of this project is to explore the concept of emotional resiliency as it relates to adults with cancer who are currently involved with a palliative care program. Due to the lack of literature that currently exists on this subject, this study aims to begin the process of establishing a plan for future inquiry. Based on the question, “What are the biopsychosocial factors associated with emotional resilience in adults currently undergoing cancer treatment who are involved in a palliative care program”, the study aims to establish an initial knowledgebase about common factors that point to resilience in adults undergoing treatment for cancer, point to future studies based on the knowledge gained, and establish initial guidelines for social work practice for those working with adult cancer patients, primarily in palliative care or medical settings to increase resiliency.

This study utilizes data gathered from patients undergoing cancer treatment while enrolled in a palliative care program at a hospital (both in and out patient). After initial IRB approval (from both the university and the hospital involved in the study), a series of face-to-face interviews with the participants (approximately 40) were conducted where the 14-item resiliency scale, paired with questions aimed at identifying biopsychosocial factors was given. Data was analyzed to look for themes and commonalities of biopsychosocial factors in those with differing resiliency scores of resiliency, as well as factors including inpatient vs. outpatient care, diagnoses, length of illness, and age.

Influence of Religious Upbringing on Views of Women in Leadership

Cara Buenz

Due to a prevalence of discussion over women’s roles within religious circles, as well as society at large, the researcher was prompted to explore the seeming disconnect between idealized equality of gender and disproportionate leadership by women that currently exists in the United States. Students at a southwestern faith-based university were administered a survey measuring influence of religious upbringing on attitudes toward women in leadership. A significant relationship was found between self-assessed conservatism of religious upbringing and comfort with women in leadership ($p = .001$). This study also found that there is a strong association between gender and comfort with women in leadership ($p < .001$), suggesting that men are less comfortable with women in leadership than their female counterparts. These results support the view that conservative faith backgrounds influence a negative view of non-traditional gender roles for women. This study utilized a researcher-generated tool to assess participants

specifically over comfort with women in leadership in non-religious settings. This tool was found to have good internal reliability ($\alpha = .89$).

Patterns of Conflict and Disaffiliation in Churches Among Traditionalists and Egalitarians
Megan Brackenbury, Matthew Hoard, and Allison Lamberth

Introduction and Problem

Gender roles in the secular world have evolved to include a more equal playing field for women in recent years. Women's roles have continued to expand within churches as well but patriarchy continues to characterize evangelical circles (Franklin, 2008). Although women have fewer limitations when it comes to occupational opportunity (Lundin, 2013), many churches have been slow to adapt to an egalitarian stance (Thompson, 2013). The purpose of this study was to investigate how attitudes about gender roles impact conflict and patterns of disaffiliation among traditionalists and egalitarians in churches.

Method

This study utilized an adapted version of the Gender Roles Attitude Scale to measure gender roles in churches (Sharp-Penya, 2012). The items were developed to measure egalitarian and traditional attitudes towards the roles that women fulfill in churches ($\alpha = .95$). A short scale was constructed to measure level of conflict and disaffiliation ($\alpha = .86$). Participants were 603 individuals recruited using social media. The sample was 68% female, aged 18 to 80; Ethnicity was 85% Caucasian; 73% married. Church affiliation was characterized as 62% traditional.

Results

Results suggest that persons with egalitarian views experience more conflict regarding gender roles within church settings than traditionalists, $r(471) = .377, p = .01$. Patterns of disaffiliation, or leaving the church, are consistent with these results. There was a significant correlation between those who stopped attending church because of their attitudes about gender and levels of egalitarianism, $r(471) = .219, p = .01$. Additionally, results suggested that people reporting higher levels of egalitarianism change churches within their denomination based on their gender attitudes, $r(471) = .218, p = .01$, as well as changed denominations $r(471) = .268, p = .01$.

Discussion

These findings reveal that individuals holding more egalitarian views of gender experience more conflict and display more church mobility and disaffiliation than their more conservative counterparts. Further, this was largely true across gender, age, and denomination. This confirms recent research which found disaffiliation trends due to lack of inclusive practices (Sharp-Penya & Macaluso & Taraba, 2013). It is unclear in the present study whether it is the (1) actual attitudes regarding gender or (2) conflict in church and/or family because of these attitudes that is responsible for the mobility.

Limitations of this study include the word-of-mouth strategy via social media which may have resulted in a self-selected bias and unequal groups of denominations. However, even within denominations, conflict was present and was related to people leaving or changing church affiliation. Future research may collect data in such a way that trends within and between denominations can be better compared. Finally, future research should evaluate the overall patterns of conflict and disaffiliation within churches in a manner that the factors can be disentangled.

Physiological Response to "Wicked" Problems Under High or Low Need for Closure

Taylor Munden, Daniel Edwards, Caleb Carr, Jesse J. Luna, Nathan W. Daniels, and Zachary Shakelford

Researchers have begun to recognize that emotional factors also play a major role in the learning process (D’Mello & Graesser, 2014). One of the problems in studying the role of emotions in learning has been the difficulty of measuring complex emotions during the learning process (D’Mello, Dale, & Graesser, 2011).

This study was intended to answer two questions. First, can physiological measures be used to detect emotion generated while attempting to solve difficult or “wicked” cognitive problems? Second, can an individual cognitive variable — Need for Closure (NFC) — heighten the emotional response to a wicked problem (Kruglanski & Webster, 1996)?

Methods

Participants. Twenty five undergraduate students were recruited from psychology classes.

Measurement. Participants completed the “Need for Closure Inventory” (Roets & Van Hiel (2007).

Physiological assessment was performed with a Biopac MP100 or MP150 system. Galvanic Skin Conductance (GSC) heart rate, and facial electromyography were measured.

Procedure. The control task consisted of reading and answering a question about Lincoln’s Second Inaugural Address, an emotionally neutral text matched for reading difficulty and length with the “wicked” problem. The experimental task involved reading and answering questions about a “wicked” problem — a problem that has multiple perspectives and for which no one correct answer can be plausible. The source for wicked problems was King and Kitchener (1994).

Analysis and results

Paired t-tests were used to test whether the three physiological measures of emotion could distinguish between the control task and the wicked problem task. No significant differences were found in the physiological responses to the wicked problem compared to the control task.

Pearson correlation coefficients were computed to determine whether the Need for Closure variable was related to the physiological measures in either the control task or the wicked problem. No significant correlations were found between NFC and the physiological measures.

Discussion

Regarding the first question of this study, can physiological measures be used to detect emotion generated while attempting to solve difficult or “wicked” cognitive problems? The finding allow two possible answers. First, perhaps the physiological measures did not detect emotional differences between the participants response to the control task and the wicked problem. Second, perhaps the wicked problem used in this study did not generate a measurable difference in emotional response.

Regarding the second question, can Need for Closure heighten the emotional response to a wicked problem, the answer is not clear. In the absence of measurable emotional response to the wicked problem, the relevance of the NFC cannot be established.

Further research should be designed which will generate a more pronounced emotional response. Also, a self-report of emotional response would help validate the physiological measures.

Humor can have a dark aspect. Analyses of humor throughout history have long noted that humor can be an expression of power and dominance. Used in this fashion, humor can be a form of aggression, a means of teasing, demeaning or humiliating others. To date, however, little work has been done on the personality correlates of those who use humor aggressively as an expression of power. The present study sought to examine the personality correlates of aggressive humor usage. Specifically, in related to humor styles the personality constructs of “the Dark Triad”—Machiavellianism, narcissism and psychopathy—were examined along with agency and communion.

Participants completed the Humor Styles Questionnaire (Martin & Doris, 2003), which assesses affiliative, self-enhancing, aggressive and self-defeating uses of humor. Participants also completed measures of Machiavellianism, narcissism and psychopathy (Jonason & Webster, 2010). In addition to the Dark Triad constructs participants also completed a measure of agency and communion (Spence, Helmrich, & Stapp, 1973).

Among the Dark Triad constructs only narcissism was positively correlated with affiliative humor styles ($r = .26, p < .05$). By contrast, all three Dark Triad measures were positively associated with aggressive humor styles: Machiavellianism ($r = .50, p < .01$), narcissism ($r = .34, p < .01$) and psychopathy ($r = .48, p < .01$). Agency was positively correlated with affiliative humor styles ($r = .28, p < .05$) and was unrelated to aggressive humor styles ($r = .01$). Communion was observed to be negatively correlated with aggressive humor styles ($r = -.31, p < .05$).

Overall, evidence was found for what might be called a “dark humor” style. Specifically, all three Dark Triad variables were positively associated with the use of an aggressive humor style, the use of humor to tease, demean or humiliate others. Such a pattern of results is consistent with theory that humor can be used as an expression of power, superiority and dominance.

Don't Feed the Trolls: Correlating the Dark Triad and Internet Trolling
Sarah Kirby and Kyle Levenick

Introduction and Problem

With the growing prominence and influence of the Internet, and the convenience of anonymity, Internet trolls are a growing problem for society. Generally speaking, trolling means “to allure, to fish, to entice, or to bait” other individuals (“Troll”). Internet trolling “is the practice of behaving in a deceptive, destructive, or disruptive manner in a social setting on the Internet with no apparent instrumental purpose” (Buckels, 2014). A study entitled “Trolls Just Want to Have Fun” suggests that “trolls operate as agents of chaos on the Internet” for their own “merciless amusement” (Buckels, 2014). These descriptions sound similar to the pathological traits embodied by the Dark Triad – narcissism, psychopathy, and Machiavellianism (Paulhus & Williams, 2002). We were interested in examining the correlations between these traits and Internet trolling. We hypothesized that possessing one or more of the Dark Triad traits would predict Internet trolling behavior.

Method

Two scales were used to study the relationship between the Dark Triad and Internet trolling. The Dirty Dozen was a 12-item scale used to measure the Dark Triad traits ($\alpha = .83$) (Jonason & Webster, 2010). The Global Assessment of Internet Trolling (GAIT) consisted of 4 items and was used to measure online trolling behavior ($\alpha = .82$) (Buckels, 2014). Example items include: “The more beautiful and pure a thing is, the more satisfying it is to corrupt” and “I like to troll people in forums or the comments section of websites”.

The survey was published online and there was no incentive for participation. Participants were 64 people from around the world with a mean age of 22 years old. The sample was 51.6% female, 45.3% male, and 3.1% other. Ethnicity was 82.8% Caucasian, 6.3% Asian or Pacific Islander, and 4.7% American Indian or Alaskan Native, and the remaining 6.2% split among other ethnicities.

Results

Each domain of the Dirty Dozen scale was individually correlated with the sum of the GAIT scale. Narcissism, $r(64) .073$, $p > .05$, and Machiavellianism, $r(64) .135$, $p > .05$, were not significantly correlated to Internet trolling. Psychopathy was a moderate predictor of Internet trolling, $r(64) .376$, $p < .01$.

Conclusions and Discussion

Findings suggest that psychopathy is the only significant predictor of Internet trolling. However, the strong correlation between psychopathy and Machiavellianism, $r(64) .474$, $p < .01$, may suggest a stronger relationship between Machiavellianism and Internet trolling than is initially apparent. Additionally, further research is needed to refine and expand upon the Internet trolling domain. It is possible that with an improved scale for Internet trolling, there will be a stronger correlation with each of the Dark Triad traits. Further studies should include a larger and more varied sample size, and a more thorough grasp on what it means to be an Internet troll.

Do You Like Me?: Affirmation Sensitivity on Social Media

Mackenzie Harrington and Jesse Luna

Problem

Social media has greatly increased our ability to share our lives with others. Social media has also increased the amount of social feedback we can receive from others. When we post updates or pictures on social media we can monitor the number of likes, shares, and comments we receive. And the amount and nature of this feedback can affect our self-concept. For example, a photo of a new haircut that receives few “likes” or affirmative comments on Facebook or Instagram can make us self-conscious and fretful, worried that the new haircut isn’t flattering. But to date, however, little empirical attention has been given to assessing and examining the correlates of how emotionally reactive persons are to social media feedback.

Method

Participants were 137 undergraduate and community volunteers. The sample was 68.8% female. The mean age was 21.95 (SD = 9.04). The ethnicity breakdown was: 46.0% Caucasian, 41% Hispanic/Latino, 2.3% Asian, 1.5% African American.

To assess degree of social media usage participants completed the Social Media Use Integration Scale (Jenkins-Guarnieri, Wright, & Johnson, 2012). Participants also completed measures of Big Five Neuroticism and Extraversion (John, Donahue, & Kentle, 1991). Regarding self-concept, participants completed measures of narcissism (Jonason & Webster, 2010) and self-esteem (Rosenberg, 1965). Finally, participants completed the Reaction to Social Media Feedback scale (RSMF), a seven-item inventory developed for the purposes of this study aimed as assessing emotional reactivity (positive and negative) to social media feedback. Example items on the RSMF include “It makes me feel good when I get a lot of positive feedback (liking, commenting, favoriting, retweeting, etc.) on things I post on social media” and “I worry if no one notices something I put on social media”.

Results

Social media usage was positively associated with being emotionally reactive to social media feedback and affirmation ($r = .61, p < .001$). Regarding Big Five constructs, being emotionally reactive to social media feedback and affirmation was positively associated with neuroticism ($r = .27, p < .01$) and unrelated to Extraversion ($r = .04$). Regarding self-concept, being emotionally reactive to social media feedback and affirmation was negatively associated with self-esteem ($r = -.24, p < .05$) and positively associated with narcissism ($r = .58, p < .01$).

Conclusions

Overall, emotional reactivity to social media feedback was associated with increased social media usage. While causality is impossible to determine, this trend suggests that social media usage may be, at least partly, driven less by sociability than a need to garner attention and solicit affirming feedback to bolster the self-concept. For example, ratings of emotional reactivity to social media feedback were unrelated to extraversion but were associated with increased and decreased self-concept (higher narcissism or lower self-esteem).

Finding Food: Venezuela's Severe Shortages

Chandler Gum, Katy Escott, and Meagan Songer

As a team of five we will be researching as a group the problem of food shortages in Venezuela. We will be specifically focusing on the time period beginning with the presidency of Hugo Chavez to the present time period with Nicolas Maduro as president. This problem began to develop and accelerate when Chavez was in office, and now that Maduro has taken over the issue has only worsened. People queue up for hours in hopes of obtaining products such as flour and butter, as well as items like shampoo and toilet paper. As a result, people have begun hoarding and selling products in the black market. Little land is being utilized in agriculture, and transportation and infrastructure problems are causing the country to import items much more than they are producing and exporting. In desperation people have been attacking supply trucks and violent outbreaks have been occurring as discontent rises and basic needs continue not to be met. As this problem continues to grow the state of Venezuela hangs precariously.

When researching this problem our primary question is focusing on what factors have led to the increasing food shortage problem in Venezuela. We have collected a list of about ten sources that focus on analyzing this issue through economic, political, and social lenses. The following questions include areas we intend to research. To what degree is excessive importing affecting the food shortage situation? How has Chavez's shift from Neoliberalism to socialism in the time of his presidency affected the way land is distributed, and how has this had adverse effects on food production? How is the lack of basic necessities affecting the lives of the Venezuelan community and how are they reacting to it? How is government involvement helping or worsening this issue, especially with Maduro as president? How do recent relations between the United States and Cuba put Venezuela in a vulnerable situation both economically and politically? How can reducing dependency on oil revenue help increase agricultural production? Overall, these questions provide a good foundation and starting point for exploring the factors of this problem. Venezuela is becoming increasingly vulnerable as this issue continues to escalate. The overall point of our research is to compile and present our analysis to show a clear understanding of this problem and the effects it has on Venezuela, as well as other areas. We suspect that we will be able to come to a conclusion that presents a few possible solutions that will give insight into making the future of Venezuela brighter and hopefully the availability of food broader.

Impact of Mobile Technology on Student Attitudes, Engagement, and Learning
Victoria Sun

Whether students bring computers, iPads, or cell phones to class, mobile devices present unique challenges as students engage in critical thinking. The purpose of this study was to identify the effectiveness of mobile devices in small group settings by addressing the following questions: How does mobile technology impact student engagement? How does mobile technology impact critical thinking? This study was conducted by observing 172 students in three different types of small group settings during spring 2014: “Common Practice” groups who received little guidance from the instructor, “Best Practice” groups who were offered a written prompt for their group time, and finally, “Technology” groups who used the “HeadsUp” application to receive prompts and guidance in their group. Three different researchers observed and coded videos of these students while watching for engagement in verbal and non-verbal cues. Assessment was also made in the area of critical thinking based on written material groups produced and in the area of engagement based on survey responses from the experience. This study seeks to understand whether technology apps should be recommended as an effective tool in small group settings.

Human Identity: From Story to Science—Withdrawn
~~———— Catherine Blakemore, Hannah Anderson, and Trevor Thompson~~

Experiencing Professional Development Through Lesson Study
Jaclyn Barker

This poster session will explain the implementation of the Japanese model of professional development known as Lesson Study in a course taught in a university mathematics department. The focus of Lesson Study is on student learning and problem solving and is performed in a community setting. Last spring, a team of pre-service teachers and myself examined data to determine related areas of student weaknesses in Algebra I and Algebra II. We then collaborated with mathematics faculty, teacher education faculty, and in-service teachers to develop an inquiry-based lesson that targets these weaknesses in attempt to gain insight on student learning.

*The Role of RecA in the Natural Transformation of *Aeromonas salmonicida**
Jacob Woods and Grace McNair

The genus *Aeromonas* is a gram-negative group of bacteria that are ubiquitous in various fresh water bodies. *Aeromonas* has also been found to be an agent of several gastrointestinal diseases and are often opportunistic pathogens. A characteristic of *Aeromonas* that has recently been discovered is natural transformation, which is the ability to take up environmental DNA and incorporate it into the bacterium’s genome. However, natural transformation has not been found to occur in the species *Aeromonas salmonicida*. Preliminary studies indicate that the gene *recA*, along with several other genes of interest, might be necessary for natural transformation to occur in this species. The gene *recA* encodes a DNA repair protein that is activated in the presence of DNA fragments and assists in the ligation of the free DNA ends. In order to investigate the role of *recA* in natural transformation of *A. salmonicida*, we will knock out the *recA* gene with a gentamycin-resistance cassette through mutation with a process called splice overlap extension PCR (SOE-PCR). Then, screening of the mutant species will occur to detect a lost ability to transform free DNA, thus indicating *recA*’s role in natural transformation in *Aeromonas*

salmonicida. This research is part of a larger investigation of multiple genes which preliminary studies suggest might be involved in natural transformation of this species.

Phylogenetic Relationships in Mentzelia section Bicuspidaria (Loasaceae)

Tabitha Lewis, William Morales, and Samuel Nix

Mentzelia section Bicuspidaria is a small monophyletic group of annual wildflowers native to the southern Mojave Desert and the western Sonoran Desert in the southwestern United States and western Mexico. Due in part to its remote distribution, phylogenetic relationships within section Bicuspidaria have not been thoroughly investigated and remain poorly understood. Most species in section Bicuspidaria have 5 broad petals and are easily distinguished from one unusual species, *M. reflexa*, that usually has 8 small narrow petals. However, preliminary work using chloroplast DNA sequences has suggested that *M. reflexa* is actually closely related to the broad-petalled *M. tricuspis* and *M. tridentata* within section Bicuspidaria. In order to test this hypothesis, we gathered multiple herbarium specimens of each species in Bicuspidaria. We extracted DNA and performed PCR to amplify the *ndhF-rpL32* intergenic spacer. We quantified the DNA and sent samples to be sequenced. In this study we use maximum likelihood analyses in order to infer the phylogeny of Bicuspidaria based on DNA sequences from *ndhF-rpL32*.

The effect of organic fertilizers in urban raised bed gardens

Reece Wells, Kevin Watson, and Anna Curby

We are examining the effectiveness of organic fertilizers in raised bed gardening. We will be using organic fertilizers from vermiculture and compost tea containers near our site. By using a method called square foot gardening we will separate our garden into one square foot sections where it will be easy to determine the effectiveness of each fertilizer without contamination. We plan to have a garden constructed approximately eight inches off the ground and four feet across by eight feet long with a total of sixteen square foot plots. The soil in our garden will be made up of layers of green plants, manure, dry plant material, and the surrounding soil. We will be planting arugula spinach (*Eruca sativa*) and radishes (*Raphanus sativus*), two plants commonly found in raised bed gardens. Each plant will have eight plots. We will be measuring three different types of organic fertilizer against a control row with each fertilizer getting four plots. We will determine our results by measuring the amount of leafy growth of each plant daily and by the root system at the conclusion of the study. Our garden is located at the McDaniel Lab Building on Abilene Christian University's Campus (32.466241, -99.711835). The productiveness of raised bed gardens is important to measure because of their increasing use in the world as a sustainable way of subsistence agriculture in urban areas and rural areas alike. This research will contribute to the discussion of the use of homemade fertilizers and their effectiveness versus potentially destructive commercial fertilizers.

The Need for Reporting Metabolic Sampling Interval in Publication: An Example Using Maximal VO₂ Values and Running Economy

Chase Harbach, Sarah Taylor, and Logan Smith

Background: Knowledge of metabolic outcomes, such as maximal oxygen consumption (VO₂) or running economy, has wide-ranging application. Metabolic outcomes are widely reported in literature yet the metabolic sampling interval (example: breath-by-breath, 30-sec average) utilized for collection is rarely ever stated. Purpose: The purpose of the present investigation was

to probe the potential discrepancies created when analyzing running economy and VO₂max raw metabolic data with four different metabolic sampling intervals. Methods: Five recreationally-active and endurance-trained subjects were included in the present analysis and four metabolic sampling intervals were analyzed: 30-sec average, 20-sec average, 8-breath, and 4-breath. Subjects engaged in 4-min running economy phases at 55 and 65% of their VO₂max before entering into a maximal protocol purposed to elicit VO₂max in 8-12 minutes. Utilizing the steady state and maximal VO₂ data, metabolic sampling intervals were analyzed for their effect on reported VO₂ values. Results: For running economy at 55%, there was no differences found ($f = 0.207$; $df = 1.862$; $p = 0.799$) between sampling frequencies when analyzed by repeated measures analysis of variance and corrected with Greenhouse-Geisser for a violation of sphericity. For running economy at 65%, there were also no differences found ($f = 1.456$; $df = 3$; $p = 0.799$) between sampling frequencies. For inspection, the relative VO₂ values were: 27.2 (± 3.1), 27.9 (± 4.1), 28.4 (± 3.6), and 28.8 (± 5.1) for the 30-sec, 20-sec, 8-breath, and 4-breath average, respectively. Maximal VO₂ values of 53.0 (± 6.6), 55.1 (± 7.2), 55.1 (± 7.2), and 59.6 (± 9.4) for the 30-sec, 20-sec, 8-breath, and 4-breath average, respectively, were found to be significantly different ($f = 21.062$; $df = 1.278$; $p < 0.001$) after adjusting for a violation of sphericity ($p < 0.001$). Bonferroni analysis indicated differences between the 30-sec average and all other averages and also the 20-sec and 8-breath averages when compared against the 4-breath average. The 4-breath average yielded the highest VO₂max value. Coincidentally, the 20-sec and 8-breath averages were identical. Conclusion: In the present investigation of raw metabolic data, sampling interval was found to impact the maximal oxygen consumption (VO₂max) values but not running economy values when investigating a small sample of data with four select sampling intervals. The report of maximal VO₂ is rather common in the literature and knowing sample interval is vital for between-study comparison, determination of regression-related activities, or for pre-post comparison of data from the same or different labs.

The Impact of Simulated Altitude on Selected Elements of Running Performance
Logan Smith and Heather Johnston

Background: Simulating altitude at sea level is increasingly more popular among recreationally-trained athletes across the sports spectrum. The AltO₂Lab is a commercially-available, handheld, rebreathing apparatus purported to simulate altitude. Currently, there is an overall dearth of evidence regarding the efficacy of the device. Purpose: The goal of this study was to add evidence supporting or challenging the effectiveness of the device to improve selected running performance-related variables and to investigate the time-course of changes should benefits be evidenced. Methods: The 37-day protocol included familiarization, baseline, and 2 follow-up visits during which time hematological (hematocrit and lactate), physiological (running economy, maximal VO₂, and heart rate), and psychological (Borg RPE) variables were monitored at rest, during relative submaximal, and/or maximal treadmill exercise. Altitude training days (18 days; one hour each day) were fitted within the 37-day time-line to occur after the baseline visit but before the respective follow-up visits. Specifically, the altitude training took place in 3, 6-day blocks of device usage with exposure, monitored by oximetry, intensifying across the days and blocks. Twelve days of altitude training were completed before the first follow-up visit while the final 6 days of altitude training were completed between the first and second follow-up visit. In this manner, the follow-ups could serve to evaluate the potential effectiveness of the device and narrow the time course of changes to a specific usage duration. Results: Six, recreationally-trained athletes (Females = 4; Males = 2; Age = 22.0 \pm 2.9 yrs.;

Baseline VO₂max 52.7 ± 6.7) enrolled in the study. One subject was removed due to noncompliance. Overall, simulated altitude at the prescribed, intensifying dosage, failed to change both hematocrit (p = 0.469) and VO₂max (p = 0.184) when analyzed by repeated measures analysis of variance. Additionally, no differences were found for secondary variables including: running economy, heart rate, lactate or RPE (all p > 0.05). Conclusion: Presently, the AltO₂Lab failed to improve selected variables related to running performance. This finding is in contrast to previous investigations with the device but it does align with the knowledge that a stronger stimulus might be necessary to induce HIF-mediated erythropoiesis to the extent that the cascade could alter hematological and subsequently performance ability through enhanced oxygen-carrying capacity. These results are preliminary and a final cohort will complete testing before concluding results will be disseminated.

The Effects of Remaining Hydrocarbons on Ecological Succession and Vegetation Following Bioremediation of a Crude Oil Spill

Nathan Neill

On 6th January 1999, a pipeline break released 70 barrels of dewatered crude oil over an area of approximately 900 m² upon the Nature Conservancy's Tallgrass Prairie Preserve (TGPP) in Osage County, northwestern Oklahoma, in the Flint Hills Ecoregion (Sublette et al., 2007). This 900 m² of tallgrass prairie lies downhill from the pipeline and was contaminated with an average level of 35,000 mg/kg of total petroleum hydrocarbons (TPH). After subsequent bioremediation and about a decade of undisturbed vegetative growth, a posteriori observations show that the contaminated area is significantly different compared to a tilled control site regarding plant growth and community composition. Our preliminary data suggests that the contaminated sites continue to have higher hydrocarbon levels than the uncontaminated tilled sites, despite bioremediation and undisturbed revegetation. We also discovered that a method of extracting hydrocarbons from soil (using cyclohexane as a solvent for Soxhlet extraction) that is more sensitive than the traditional laboratory methods for the detection of petroleum-derived hydrocarbons. Notably, the early data suggests that the spill site has significantly different species composition and lower species richness than both the uncontaminated preserve areas and the tilled control site. The data shows that the tilled control and the spill sites both have lower mean species richness than the native controls, but the tilled control sites are significantly more similar to the native samples in richness and composition. This data, as well as the substantive abnormal hydrocarbons in the contaminated sites, suggest that the hydrocarbons not removed through bioremediation favor a plant species composition unlike that of the surrounding TGPP. The data suggests that the previous bioremediation may have been insufficient to restore biological normalcy to the prairie composition and that further testing and bioremediation may be necessary to return it to its natural state. In this study we increase the density of soil samples in order to more precisely estimate hydrocarbon levels and test hypotheses generated by the preliminary results.

Quantifying Wolbachia and Spiroplasma Infection Rates in Monarch and Queen Butterflies

Lydia Brown and Jamie Thompson

Monarch (*Danaus plexippus*) and queen (*D. gilippus*) butterflies are common, ecologically important components of terrestrial ecosystems throughout North America. Monarchs are of special interest due to their annual long-distance migration from the US to overwintering

grounds in Mexico. Recent data suggest a decline in monarchs, possibly linked to a decrease in their food supply, loss of overwintering habitat and/or bacterial infection. Maternally-inherited male-killing bacteria infect many insect species, and are known to infect monarchs in the eastern US. The effect of these male-killing parasites on the health and structure of local butterfly populations is unknown. The purpose of this study was to screen for two maternally-inherited male-killing bacteria, *Wolbachia* and *Spiroplasma*, in local monarch and queen butterfly populations. During the fall of 2014, butterfly specimens were collected (37 monarchs, 42 queens) from around ACU's campus. Sex ratios and basic ecological information were recorded. PCR amplification using *Wolbachia*- and *Spiroplasma*-specific primers was used to screen for the presence of these parasites in butterfly tissue. Given that the primers only match gene sequences within the genomes of *Wolbachia* and *Spiroplasma* bacteria, amplification only occurred when these parasites were present within butterfly tissue. PCR products were checked using gel electrophoresis with a size standard to ensure that amplified products matched the expected size. Our project is still in its early stages, but thus far, DNA has been extracted from 14 butterflies, and the *Wolbachia*-specific primers have amplified putative *Wolbachia* from two monarchs and one queen. We plan to increase our sample size over the coming year to better understand the relationship between infection rate and overall population structure and health.

An Analysis of Genetic Relationships Between North American and South American Populations of Tadarida brasiliensis
Kimberly Burt and Michael Ramirez

In 2014, I started this project by extracting and sequencing several bats using the cytochrome B (cytB) mitochondrial gene. This gene has been proven to work well when working with phylogenies of other species the Biology Department has worked with before. I gained a partner, and we also obtained several sequences from GenBank to enhance our project and give us a larger sample size. However, when we sequenced the DNA and made it into a phylogeny, the populations in North America and South America were so different that we could not connect them together at all using our software. This would normally be a pointer that the populations might have speciated, but this particular mitochondrial gene is known to mutate quite frequently. Thus, we hypothesized that the bats simply may not migrate between continents, as there was little data we could find about their migration patterns. We needed to find a gene with less variability to compare the organisms with, so we sequenced the 16S gene in the ribosomal RNA. This particular gene has been known to mutate quite a bit slower than cytB. We picked it because we wanted to be able to compare the two populations in a single phylogeny. However, when we sequenced the PCRs that we got from 16S, there was little to no variability between any of the organisms. Since our results have been such polar opposites with these different genes, we have decided to start working on sequencing the COI gene. This gene is also mitochondrial, but it is known to be less variable than cytB. Research on GenBank suggests that other researchers have had success with this gene and *T. brasiliensis*, and we expect that the COI gene will have an intermediate level of variation between cytB and 16S.

Determination of Environmental Impact of Urbanization in Abilene Based on Changes of Soil Conditions and Plant Types
Jaime Gordon, Alex Buckel, and Dayna Roe

Before Abilene became a city it was undeveloped land managed by grazing wild buffalo herds. In the 1880's and 90's the area began to colonize and has now reached a population of 117,000 people. Throughout this time the area's environment has been transformed from undeveloped

rangeland to an urbanized city. Flora and soil condition of the land before urbanization are compared with the current plant and soil condition. Natural changes of soils and plants found are determined by comparing disturbed and undisturbed areas of the same soil type by analysis of soil type, depth, horizons, pH, and the plant types found at these locations. Data is compared to past and present soil type information available from the Natural Resource Conservation Service's web soil survey maps. Conclusions are drawn concerning the environmental impact of urbanization in Abilene.

Tuesday, March 31, 1:30 – 2:50 PM

Session C1: Culture and Rhetoric - McCaleb Room Zone A

Do We Value Commitment? A Rhetorical Analysis of New Girl

Bailey Cate

In today's society, media pressures audiences to seek romantic relationships and/or hookups; however, is the quality of those relationships decreasing? Many sources send these messages, including magazines, television, songs, and novels. With the growing prevalence of Netflix and television in mind, I examine how rhetors demean the value of commitment in adult relationships through television sitcoms. By analyzing arguments, visuals, narratives, and language, I conclude that Meriwether is doing a great job of exemplifying the trend in culture of limited commitment, leaving us to ask the question: is it time to raise cultural standards about the value of commitment?

The Power of the Pant Suit: A Rhetorical Analysis of Hillary Clinton's Campaign Dress

Kalyn Prince

In the first debate of the 1960 election, John F. Kennedy chose to wear makeup for the cameras while Richard Nixon did not, resulting ultimately in a win for Kennedy. From that time, politicians have been challenged by the impact of their appearance at televised events. Clearly in politics, appearance matters. As women have entered into the political process, the topic of wardrobe has only grown in importance because of the manner in which female politicians' wardrobes are critically examined. Hillary Clinton is perhaps the one woman in America most familiar with this scrutiny.

Political historian Shawn Perry-Giles notes in his book *Hillary Clinton in the News* that though Clinton has been in the public eye for decades, she fights to be perceived as a serious, capable politician by negotiating her appearance to the same level as her message. Even at times indicating world news through a hairstyle, Hillary Clinton is no stranger to the importance of having a strong personal presentation. As the single most powerful woman in American politics, Clinton provides the standard for studying the impact of physical appearance on the public's perception of a female's political efficiency.

This paper will be a rhetorical analysis of Hillary Clinton's wardrobe over the next few months while she is on the campaign trail. When she delivers speeches during this time frame, rather than analyzing her words, the paper will analyze her suits. Will she try to appear younger? More feminine? Less feminine? Will she try to appear powerful or approachable? In an ideal world, the nation would not evaluate Clinton's potential as President based on her clothing, but Michelle Obama's arms and Sarah Palin's wardrobe budget prove that this society has a different mindset. Clinton, being savvy and having savvy people on her campaign team, knows this about the

country and will use it to her perceived advantage. The rhetorical analysis will seek to discover exactly how she has done that.

The methodology for this paper will draw on the theory of visual rhetoric. Artifacts for the project will be images of Clinton in public appearances, her wardrobe being the primary object of analysis. Beyond these images, books such as *Appropriating Dress* by Carol Mattingly and *Hillary Clinton in the News: Gender and Authenticity in American Politics* by Shawn Parry-Giles, as well as articles like “The Discourse of Dress and Appearance: Identity Talk and a Rhetoric of Review” by Scott A. Hunt and Kimberly A. Miller will inform the piece. The most substantial part of the project will be coding the texts and analyzing the findings of the coding. Research for the project and the coding of the artifacts has already begun and will continue into early February.

Earth Speaks: Environmentalism and the Music of John Luther Adams
Austin Lemmons

John Luther Adams printed the following on the top of the score for his orchestral work *Become Ocean*: “Life on this earth first emerged from the sea. As the polar ice melts and sea level rises, we humans find ourselves facing the prospect that once again we may quite literally become ocean.” In this Pulitzer Prize-winning work, Adams creates an aural soundscape that places the listener in the midst of a vast ocean. There is a growing group of artists who advocate for conservation from their platform as musicians, and Adams is one very outspoken composer for this cause.

Reviews of *Become Ocean* have touched on its significance to the environmental cause; however, it is unclear whether or not the music comes directly from Adams’s passion for the preservation of the earth. I seek to explore what connections Adams’s music has with efforts toward conservation and environmentalism. While I employ various writings and reviews that create a lens through which to view his work, my primary resource for this research is personal correspondence with the composer. I posit that, while his works are not direct propaganda or even political in nature, they do evoke a sense of appreciation and concern for the natural world.

The Building Blocks of Society: An Analysis of Messages in The Lego Movie
Abby Ayers

Pop culture has always been an influential and useful type of rhetoric in society. Directors, writers, and producers often use movies as platforms to speak to the many different audiences that could potentially be reached. These types of rhetorical undertones are very evident in the 2014 animated picture *The Lego Movie*. This film is important to study because it calls out many of the faults in society and the pit falls of status quo that Americans seem to have accepted and fallen into. The movie encourages people to question things that have gone unnoticed. With this exigence and context in mind, my analysis addresses the following question: How do rhetors use movies to critique the American government's control and influence on society? In order to answer this question, I analyzed the arguments and visuals, language, and narratives present in *The Lego Movie*. These are rhetorical tools that rhetors often use in films that offer insight into the rhetor’s deeper messages. I argue that creativity, individualism, and free-thinking are major themes present in *The Lego Movie*. This film encourages people to have their own thoughts and beliefs and shows how dangerous it can be when you go along with the status quo.

What's Black and White and Read Online?

Madeline Orr and Marissa Jones

Applying contemporary uses and gratifications theory, this paper will explain how student media should adjust its distribution strategy to better adapt to changing news consumption habits of young people. A growing number of college, local and national newspapers are transitioning from print to digital. This move reflects an attempt to better reach readers who increasingly consume media online.

A recent poll found that 76 percent of 18 to 29-year-olds who own a cell phone access news on their mobile device, and 71 percent discover news through social media (Media Insight Project, 2014.) Multiple studies agree with these findings. The uses and gratifications media theory proposes audiences actively seek media to satisfy individual needs. Because young adults are turning to online media, this theory can help explain what wants and needs in news reception they are seeking to gratify and their choice of media. National newspapers such as The New York Times and The Washington Post are recognizing this shift in consumption by adapting digital-first models in their newsrooms as are student publications at Columbia University, Oklahoma State University and Arizona State University.

This study will report the trends in media consumption by college-aged individuals and examine how they might be applied to student media, using the the Optimist, ACU's student-run newspaper, as a case subject. Envisioning a shift of the 102-year-old Optimist from a print to a digital-first newsroom, the researchers will reinvent newsroom roles, establish a digital-first distribution plan and redesign the network's website to mirror successful trends and readers' preferences. By applying well-established theory, this should create a sustainable news model that connects with the Optimist's readership.

Session C2: "Time" for Physics: "Exciting" - McCaleb Room Zone B

Improved Excited-State Interaction Potentials for Alkali-Rare Gas Pairs and Their Application to Alkali Laser System Development

Christopher Campbell

We have determined the B states of several alkali-rare gas atom pairs via absorption spectra simulations. These improved B states can be used to determine the range of internuclear separation in which alkali-rare gas pairs can absorb pump radiation in an alkali-rare gas laser, facilitating the design of these systems. Simulation and optimization techniques will be discussed.

Measuring the number of protons in a particle accelerator pulse using light

Anthony Brown

FNAL E906, also known as SeaQuest, is a fixed target Drell-Yan experiment using the Fermilab 120 GeV Main Injector. It is designed to determine the ratio of anti-down to anti-up quarks within the nucleon. In order to more effectively take data it was necessary to inhibit the trigger when pulses have too many protons. This was achieved using a Cherenkov counter to identify the number of protons in each 1 nanosecond beam pulse during each spill. This information was also graphed for display in real time to monitor of the performance of the trigger inhibit. The display shows the frequency of protons per pulse around the trigger inhibit, which is adjusted to block spills before and after large pulses. This allows visual information of the beam intensity near the inhibit to see if the large pulses also have larger numbers of protons. The display also

shows the time before and after these large pulses occur since the effects will extend past the time of a large pulse due to the slower response of drift chambers that will have had a large number of particles traversing them.

Building Detectors to Study a New Phase of Matter

Cecily Towell

The Relativistic Heavy Ion Collider at Brookhaven National Laboratory is an accelerator with a 2.5 mile circumference, which allows nuclear physicists to accelerate the nuclei of heavy atoms to a speed very close to the speed of light. By colliding nuclei at such high speeds, physicists have discovered a new state of matter called the Quark Gluon Plasma (QGP). The QGP is an extremely hot state of matter where the protons and neutrons of the nucleus melt into smaller particles called quarks and gluons. To allow for continued, effective study of the QGP, detector upgrades are being developed. An important upgrade for this study is more sensitive timing instruments that would allow for better identification of the particles that emerge from the nuclei collisions. There are two types of detectors that are being considered to improve timing resolution. In order to test these detectors, a test stand was built. The test stand has many different components, including high precision tracking instruments and fast analog to digital converters. The design and initial results of the test stand will be presented.

Improved Timing Instruments for Particle Identification

Hannah Hamilton

Experiments at Brookhaven National Laboratory's particle accelerator, called RHIC, have given rise to the discovery of an extremely hot state of matter called the quark gluon plasma (QGP). The QGP consists of a mixture of the constituents of particles like protons and neutrons. To further study this, detectors within RHIC must have more sensitive timing instruments, to better identify particles that emerge from collisions within the particle accelerator. A potential detector with more precise measurement capabilities is a microchannel plate photomultiplier tube (MCP-PMT), which relies on the interaction of charged particles through light emitting plates to track the motion of particles. In order to utilize MCP-PMTs, a test stand was assembled. To reach a timing resolution of 10 picoseconds, readout electronics must have good timing resolution. The chosen electronic was the DRS4 version 5 evaluation board, which provided resolutions as good as 3 picoseconds. The status of this research and development project will be presented along with studies of the timing resolution of different electronics that were considered.

Laser Transport System for Calibration of the NIFFTE Time Projection Chamber

Aric Tate

The Neutron Induced Fission Fragment Tracking Experiment (NIFFTE) is a collaboration with the goal of improving our understanding of nuclear fission. Nuclear fission occurs when the nucleus of an atom splits, releasing energy and particles. A Time Projection Chamber (TPC) is able to track the paths of these particles. Improving the measurements of these fission events is critical to designing the next generation of nuclear reactors that will be safer, more efficient, and produce less waste. A calibration system is being built to increase the accuracy of the NIFFTE TPC in recording these fission events. The calibration system will consist of a laser transport system (LTS) that guides a high-powered ultraviolet laser into the TPC. The LTS will allow for safe monitoring of the laser alignment via camera readouts. This system will reflect the laser

beam in a predictable way throughout the TPC simulating the paths of fission particles. The ionization tracks created by the high power laser will allow for calibration of the TPC. The commissioning of the LTS and initial testing of the LTS using a He-Ne will be presented.

Session C3: Computers, Student Learning, and IT – Alumni Conference Room

Security for the Internet of Things

Alicia Clark

The Internet of Things (IoT) is a concept, a real idea, in which every single item used in our lives is connected to the internet through RFID, WiFi, Bluetooth, 3G/4G, IR, etc. This idea is already in use today, with TVs, eye glasses, and phones, just to name a few. However, our research on the IoT revealed a problem in the security of the devices and the connection media used to pair them to the Internet. Since the IoT is in the technology field, the research doesn't involve a hypothesis or research question, but instead tends to have a problem statement and a proposed solution. Hence, once we analyzed the lack of security, we observed there was no defined framework for securing devices in the IoT. Once we stated our problem, we then started planning the path to solve this issue – discovering an appropriate solution and then choosing the steps needed to achieve that solution. Throughout the process of researching the best and most efficient ways to securely bring the Internet and devices together, we found incomplete lists of areas for uses of the IoT exist. As a result, acknowledging and fixing that became the first step of bringing this solution into the world. Using more research with the incomplete lists, we were able to fill in the gaps, completing the IoT categories as well as the internet-connecting media. Our domain knowledge also helped us determine the safest ways to prevent security issues, further leading us past that particular milestone by providing methods for protecting all assets of the IoT. To add closure to the solution, we created a table where each cell is an intersection between a category (such as personal accessories) and a connection medium (such as Bluetooth and WiFi). For each intersection, we applied the preventative measures that were needed in order to mitigate the security on the devices. By doing that, we are now able to, no matter what device is used, connect and secure every device to the Internet. If all devices were to use this paradigm, we can ensure that the IoT device and connection will be secure, therefore arriving at our first solution. After this paper with the proposed problem and solution (completing an organized framework) is published, our next solution to completely solve this problem will be to establish a firm set of rules and logo that will act similarly to FDA requirements, meaning that it will be required for all the devices and connection media to meet so that they can be approved for the IoT. Because the Internet of Things is growing and expanding quickly, security needs to be implemented and deployed for future technology to be friendly towards society.

Securing an Organization: Prioritized Steps

Alani Peters

Cyber security continually becomes a greater risk as technology evolves. Businesses continue to grow and use more electronic media in their information communication and storage. Security breaches are a constant fear for all because of their tremendous impact. Breaches not only consume vast amounts of money and time, but they also damage an organization's reputation and can directly affect a business's customers. With companies such as Target, Home Depot, and Sony having devastating security breaches, how will other businesses manage to stay secure? With this problem in mind, we began our research using the creative research method. This

method begins by establishing a problem statement based on a literature review. The problem is the lack of easily accessible security prioritization tools for each individual company. There are a few companies that one may hire to assess security. However, the cost of this service is extremely high. Companies need an inexpensive and easily comprehensible way to assess their cyber security. Once the problem is well defined, the second step is identifying a conceptual solution to the problem. The solution is a set of customized guidelines for an organization's optimal security. This solution includes metrics that must be defined, security measures for the company to implement, and organizing the measures in the order they should be executed. The last step is creating new knowledge based on existing knowledge and developing the solution. In order to create this new knowledge, we researched case studies, the BSIMM, federal level organizations including the National Institution of Standards and Technology (NIST) and the Bureau of Labor Statistics (BLS) as well as many other sources. Specifically, the Bureau of Labor Statistics lists business industries. With the help of these sources, we have constructed our unique rubric that will allow an organization, or business, of any size to determine the most effective and cost efficient security measures. A user of this framework will define their organization's industry type, number of employees, intelligence sensitivity, risk, and other aspects. These facets will determine which security actions will best help the organization. Each security measure costs more than just money. They cost time and frustration for the intended user. Finding the balance of every component is the key to this framework. With each characteristic defined, the business would receive a list of security actions tailored to their priorities and budget needs. These actions would be organized by importance. All types of businesses would be able to use this rubric as a guide to securing the cyber systems within their organizations.

Improving Automated Feedback for Programming Courses
Roger Gee

Introductory programming courses introduce students to the fundamental concepts of computer programming. Since many of these students have never attempted programming before, the coursework consists of numerous small programming assignments which gradually increase in difficulty over time. Automated assessment tools are widely used to grade these assignments and as teaching tools to help students improve programming skills. Student submissions are compiled (checked for syntactic correctness and built into a form a computer can execute) and then run against a variety of test cases before given a score. If the compiler does not accept the submission, an error message is presented to the student. The feedback provided by the compiler, however, is not targeted to inexperienced programmers and so can be difficult for students to understand. Our study examines the effect of improved feedback from automated assessment tools toward increasing student learning. By clarifying error feedback messages, we hope to decrease the occurrence of student errors. In order to improve feedback, several upgrades were made to the automated assessment tool Athene used at Abilene Christian University. The system was updated to break up student submissions for analysis. In addition, the system now catches compiler error feedback and provides more human-friendly alternative messages. These improvements provide an analysis framework upon which the syntax and static semantics of student submissions can be studied and potentially corrected. We expect that students using the updated tool will show improved performance, as measured by iterative improvements in their own program submissions as well as in comparison to student submissions from previous

semesters in which the improved feedback was not available. Our presentation will discuss the implementation of the software's improvements and how it affects student performance.

An Innovative Technique for Measuring Concept Mastery

Kayla Holcomb and Nevan Simone

Freshmen-level programming courses have been shown to have one of the highest failure rates across college campuses. Students who fail this course as part of their required major often leave the major. These courses typically cover foundational programming concepts such as variables, arithmetic operations, data input and output, program control structures, and functions. Measuring the mastery of this material usually involves having students answer questions about relevant vocabulary, trace code to predict program output, and write code given a problem statement. Assessing written code is often the most difficult of these tasks. When attempting to perceive a student's competency, instructors most frequently resort to evaluating assignments that the student has already tested for errors, corrected, and submitted. This is commonly done using an Automated Assessment Tool (AAT). An AAT is a system that, according to its original design purpose (grading, error detection, style conformity, etc.), evaluates student programming submissions according to a relative metric. The School of Information Technology and Computing uses an AAT called Athene (developed and managed by SITC faculty and staff), which assigns grades largely according to correctness of output for a given programming assignment. However, even the most advanced AATs are limited when it comes to recording student progress in an assignment, since the majority of students will only submit to the tool when they believe they have a working program. Having access to the steps a student takes in order to solve a given problem could provide CS educators a more complete understanding of the student's thought process. We are creating a simple version of an AAT that employs the Google API and tracks, in finer detail, line-by-line the steps taken to solve a pre-determined programming assignment and the sequence of those steps. The experiment will be timed and monitored, and the student will not have the ability to test their program. Then the student submissions will be categorized by the order of steps completed, which is expected to correlate with either correctness of the finished program, course grades, or unit exams. This experiment should identify commonalities in successful strategies for problem-solving within a programming course environment. With this, teaching methodologies can be modified to foster this successful approach in students.

Session C4: STEM Assortment: Drugs, Energy, Fuel, and Rockets - LYNAY Classroom

Distributed Drug Discovery: Synthesis of Unnatural Amino Acids as Potential Antimalarial Drugs

Amanda Dugan

One of the major challenges facing developing nations is that their populations are afflicted by tropical diseases for which there are inadequate treatment and prevention strategies. The pharmaceutical industry of developed nations develop drugs for economic gain, therefore, diseases plaguing the developing world are often ignored. Distributed Drug Discovery (D3) is a project founded at Indiana University-Purdue University Indianapolis (IUPUI) to address this need. D3 is collaboration between non-profit organizations and institutions that can focus on the discovery of drug leads for neglected diseases. The program is designed on an open source collaborative model to allow small groups in diverse locations to design, synthesize, and test potential drug leads targeted toward tropical diseases. In response to two antimalarial assay hits,

our team at Abilene Christian University has synthesized many unnatural amino acids analogs using resin-based combinatorial chemistry. Proton nuclear magnetic resonance spectroscopy has been used to characterize the compounds, thin layer chromatography to determine purity, and cyanosilica columns to purify compounds. Additional analogs will be synthesized in future work. All compounds synthesized will be characterized with high performance liquid chromatography – mass spectrometry (LC/MS) before the compounds are sent to cooperating institutions for biological assay.

Energy Harvesting via Piezoelectric Generators for Smart Devices

Kyle Bowling

With the rate at which microprocessor technology improves growing faster than battery technology, the need for alternate power sources is becoming more important than ever. While our dependence on batteries may never disappear, active charging technologies may prove to be a viable solution. Energy harvesting allows for the passive charging of smart devices and removes the necessity for external charging devices. This idea will be tested by integrating a piezoelectric generator into a Smart Watch's power delivery system. This presentation will then discuss the relevant physical laws and principles that drive energy harvesting, the various energy harvesting methods and the feasibility of integrating piezoelectric generators into smart devices to limit or remove the need for external charging.

Comparison of Two Biologically Derived Disaccharides for Use in Sugar-KNO₃ Rocket Fuel

Daniel Whitefield

The fuel mixture known as r-candy is well known and commonly used by amateur rocket enthusiasts. This type of fuel takes advantage of the reaction between any carbohydrate, usually sucrose, and an oxidizer, usually Potassium Nitrate (KNO₃, or commonly, saltpeter). This study seeks to compare the efficiency of the standard carbohydrate carbon source, sucrose, a disaccharide derived from sugar cane, and a novel carbohydrate carbon source, lactose, a disaccharide derived from milk. Results of this study would be of particular interest to amateur rocket enthusiasts who enjoy hand crafting every aspect of their rockets, including the fuel. Teachers of science who wish to peak their students interest and inspire them into a love of chemistry, physics, engineering, or even biology would also find the results useful. Extraction methods for lactose from milk and sucrose from sugar cane were researched, optimized based upon available equipment, and implemented. Fuel preparation and engine assembly were optimized through data gained by small scale fuel tests comparing mixing methods, the effects of different additives at 1% concentration by mass, and loading engine casings with varying amounts of test fuel. Preliminary results indicate that a mixture of sucrose and KNO₃ in their stoichiometric ratio with a 1% addition of Ferric Oxide (Fe₂O₃, or commonly, rust). Preliminary results have also indicated that cooking the powdered mixture until the sucrose melts and dissolves the other reagents is the optimal preparation technique. Engine casings were made by wrapping printer paper around a wooden dowel while applying wood glue to give the tube strength and rigidity. Further steps will include fashioning the nozzle using water putty. Also, two engines will be assembled using optimized techniques, one with sucrose and the other with lactose. Both engines will be loaded into a commercial model rocket fuselage and their masses will be recorded. This project will culminate in the final test in which these two rockets will be

launched, and flight time, altitude, and stability of the flight will be recorded. Based on the data collected from these launches the most efficient fuel will be able to be determined.

Computational Optimization of Model Rocket Flight and Experimental Analysis
Christopher Campbell

This project concerns the optimization of model rocket design via numerical simulation and experimental analysis of the optimized design. In an effort to refine the traditional model rocket design process, I have created a computational routine which simulates the rocket's motion according to Newtonian mechanics and estimates the maximum altitude of its flight path. Relevant parameters include such as the rocket's shape, mass distribution, and experimental engine thrust data. Computational optimization of the simulated rocket's predicted altitude is then attempted by modifying fin shape and position for repetitive simulation. Construction and experimental flight analysis of the optimized design will also be discussed, with emphasis on agreement with simulation.

Session C5: Christianity and Scripture – AT&T Theater

John Calvin and the Ecclesiastical Government in Geneva
Parker Pollard

Where does the idea of the modern welfare system come from? While many societies have had a version of welfare, many of the practices in modern states can be traced to the Reformation, and more specifically to the government found in Geneva under John Calvin in the Sixteenth Century. While Calvin's theological and political legacies are polarizing for some, he undoubtedly was a man who was deeply compelled by the suffering of the poor. This led him to institutionalize in Geneva many of the systems of healthcare and social service we now take for granted in the Western world. This research shows the connection between Calvin's theological ideas and his practices regarding the care of the poor and sick, as well as institutions he founded like the General Hospital, Bourse Française, and the University of Geneva. This paper also looks at the ways in which the Genevan primary education system influenced the modern education system. With this paper I hope to illuminate ways that John Calvin revolutionized welfare systems in the West. Sources include Calvin's own writing such as Institutes of the Christian Religion, Christ and the End of Law, selections from different sermons he gave while in Geneva, as well as secondary sources written by a variety of Calvin scholars.

Paul's Ministry in Thessalonica
Dominique Rideout

This study attempts to distinguish between literature and history in Luke's account of Paul in Thessalonica in Acts 17:1-9. For many years, scholars have argued over the historical accuracy of the sequel to Luke's Gospel, and this pericope is often cited as proof to the contrary. This study, however, assumes that Luke's narrative is an accurate account of Paul's work when planting the first century church. With this hypothesis in mind, this paper will discover the kernels of history through a historical-critical analysis of this section as well as of related passages in Acts and the Pauline letters. The primary mode of research will be a comparison of Luke's version in Acts 17:1-9 and Paul's in 1 Thessalonians 1-3. It will review controversial topics such as the ethnic composition of the church, the nature of the conflict, and details such as how long Paul was in Thessalonica and where he likely preached the gospel during his stay.

Additionally, this study will look at similar Pauline encounters in Acts to determine what parts might be considered a standardized Lukan depiction of Paul's missionary journeys. By analyzing the similarities as well as the differences between these reports, this project will show that while Luke had a theological agenda of emphasizing the unity of the first century church, his portrayal of Paul in Thessalonica is rooted in history.

Esau, Edom, and Christian Identity
Ethan Laster

This paper examines the function of Esau and Edom in early Christian literature, particularly in light of contemporary Jewish hermeneutics. The Esau of Genesis is a sympathetic character—deceived by his brother and scorned by his mother. Yet later Jewish writers and interpreters demonized Esau by attributing a host of unsavory qualities and actions to his character, unfounded in the source material. While much research has been done to demonstrate the interpretive connection between Esau and Rome in Jewish thought, my work examines the ways early Christians utilized Esau and Edom to assist in communal self-definition over against their Jewish cousins. First, I will describe and define key aspects of the Jewish hermeneutic, particularly the use of Esau and Edom as an allegorical figure for the “other,” and the attribution of uncorroborated negative characteristics to them. Next, I will examine the ways in which Christian writers from the first and second centuries participated in this contemporary Jewish hermeneutic and differed from it—namely in the “softening” of Esau's character and the focus on election by God. Lastly, I will explore the theological implications of the Christian hermeneutic in the formation of Christian identity that shares the same roots as Judaism but differs in substance. My work will trace the historical divergence of the Jewish and Christian faiths as demonstrated in the Christian use of Esau and Edom as polemical figures. This research participates in and contributes to the ongoing conversation concerning how early Jesus followers created a distinctive Christian language, theology, and identity born from Jewish origins.

The Gentile Mission Revealed in Acts 2
Joseph Prince

Many exegetical outlines of Acts consider its second chapter to be a launching point for the Church's spreading to diaspora Jews. While it is true that the Day of Pentecost does involve the geographical extension of the people of God, the event symbolizes much more. In my research, I will demonstrate how Luke uses different literary elements to reveal God's plan to extend the Kingdom of God to the Gentiles, which is revealed on the Day of Pentecost. My areas of focus will be to analyze the Joel quotation in Peter's speech in Acts 2:14-36, as well as researching the Lukan Peter and reflecting on his literary purpose in the book of Acts. While the Day of Pentecost is often recognized as the completion of Joel's prophecy, it is simply part of the prophecy's fulfillment. Joel's prophecy is not completed until Peter visits Cornelius in Acts chapter ten. My research is critical, because it provides evidence that Luke saw the mission to the Gentiles foreshadowed in Jewish scripture and wove those Jewish scriptures into his portrayal of Peter.

An Intertextual Study of Acts 20:17-38 and the Septuagint
Garrett Lane

Richard Hays, through his book *Echoes of Scripture in the Letters of Paul*, has reinvigorated intertextual study of the New Testament and the Septuagint (LXX). Luke-Acts in particular has a strong relationship to the LXX. The author, at the opening of Luke-Acts, invites the reader to engage in the story by looking for “the things fulfilled among us” throughout the book — expressed through the use of LXX direct quotes, allusions, and echoes. The aim of this study is to analyze the relationship between Acts 20:17-38 (Paul’s speech to the Ephesian elders) and the LXX motifs, allusions, and echoes found in this pericope. Since there are no direct quotations of the LXX in Acts 20:17-38, the point of the study will be to attempt to discern the implicit influence of the LXX in this passage and how it affects our reading of the speech. In looking for echoes of the LXX I will use Richard Hays’ seven tests to finding echoes in scripture found in the first chapter of his book *Echoes of Scripture in the Letters of Paul*. Specifically, I will question the significance of the sheep/flock, wolf, and ‘will of God’ motifs, seeking referents in the LXX. This study is not aimed at being a linguistic study or historical-critical study, but rather a study to search for the implicit influence that the LXX has over this passage. Since Paul’s speech to the Ephesian elders has not been studied from this perspective before, I hope to start a conversation by presenting the echoes that resonate the loudest in the text.

Tuesday, March 31, 3:00 – 4:20 PM

Session D1: Biochemistry Focus - McCaleb Room Zone A

New Osmium Carbonyl Clusters with Dicarboxylate Ligands

Soo Hun Yoon

Metal Organic Frameworks (MOFs) represent a new frontier in chemistry with applications ranging from energy storage to drug delivery. Dicarboxylic acids, in their anionic form, are widely used to link metal clusters together to form MOFs. We have been investigating the reaction of dodecacarbonyltriosmium, $\text{Os}_3(\text{CO})_{12}$, with different dicarboxylic acids using a microwave reactor with the goal of producing MOF building blocks. We have synthesized two types of osmium compounds with dicarboxylate ligands: dinuclear clusters with intramolecular chelate rings, and tetranuclear and hexanuclear clusters with intermolecular bridges connecting two or more diosmium units in a rectangular or triangular fashion. These new metal clusters have been reacted with additional ligands in order to increase their stability in the presence of air and water. We have grown crystals of each compound through various methods in order to obtain the molecular structure through X-ray crystallography. We are continuing to vary the length and type of dicarboxylic acids used in order to determine how short and how long the intramolecular ring can be and what characteristics of dicarboxylic acids lead to the formation of multinuclear osmium metal clusters.

*Searching for an interaction between *E. faecalis*’ Fusion and Synthase proteins, of the mevalonate pathway, through the use of FRET*

Ana Arango

Almost all organisms require isoprenoids, the most famous of which is cholesterol, to survive. These molecules are made by one of two pathways: the mevalonate or the non-mevalonate pathway. While bacteria were originally thought to contain only the genes encoding the nonmevalonate pathway, it was discovered that gram positive bacteria encode only the mevalonate pathway, like most eukaryotes. *Enterococcus faecalis* is one such gram positive bacteria that encodes the mevalonate pathway. What makes this bacteria, and a few others, stand

apart from other organisms the enlist the mevalonate pathway is the formation of two of its enzymes. Normally, all of the enzymes in the pathway exist structurally-independent of each other. In *E. faecalis*, however, the first and third enzymes of the pathway (Acetoacetyl-CoA Thiolase and HMG-CoA-Reductase, respectively) are encoded together to form one dual-functioning protein called the Fusion protein. This fusion is unusual because it would be easy to understand a fusion of two consecutive enzymes, but this Fusion protein skips an essential enzyme in the pathway that catalyzes the reaction linking the reactions of the first and third enzymes from which the Fusion protein is composed. As such, it seems logical to suspect that the Fusion protein and the second enzyme HMG-CoA-Synthase might interact in order to compensate for the lack of physical connection between all three enzymes. In 2012, student researchers found interaction between the Fusion protein and HMG-CoA-Synthase. The following year, other students were unable to replicate the results. Our goal for this experiment was to re-create the data from two summers ago in as consistent a manner as possible, to determine what circumstances are required for the interactions to occur, or to determine why previous researchers received false positives. We were able to identify two obstacles that are likely the reasons the FRET results were inconsistent for the 2013 researchers, and began to attempt to replicate the data obtained in 2012.

Microbial Diversity and Antibiotic Production in Sorcerers Cave
David Sanderson

Access was granted with express permission from the land owner to a deep private cave that previously had limited exploration and no conducted microbial research. Cave microbiology is a relatively new field that possesses many environments previously unknown to contain microbes and has the potential for new drug discovery. The goals of this study were to find new species of bacteria as well as antibiotic-producing bacteria. The samples were aseptically taken from deposits on speleothems (cave formations), pools of water deep in the cave, and from bat guano. The samples were pulverized, diluted in a 0.85% NaCl solution, and plated onto various types of growth media. This included 0.01X, 0.1X and 1X tryptic soy agar. The colonies were then transferred by replica-plating onto fresh plates of media and then overlaid with *E. coli* and *S. aureus* in 0.7% soft agar to screen for the presence of antibiotic production from the cave microbes. A preliminary investigation indicated the presence of antibiotic-producing bacteria. 16S rRNA DNA was then amplified by PCR from the antibiotic producers and sequenced to determine the identity and presence of new bacterial species.

Novel role of the yeast Spn1 protein in DNA Damage Repair
Rachael Carstens

Spn1 is a highly conserved and essential yeast protein initially discovered because of its role in the transcription of DNA. A mutant of the Spn1 protein called Spn1-DAmP results in depletion of this essential protein. In addition to affecting the transcription process, depletion of Spn1 also results in hypersensitivity to the DNA damaging agent methane methylsulfonate (MMS). This finding implicates that Spn1 has a possible role in DNA damage repair. Because of this sensitivity, we set out to explore the function of the Spn1 protein during DNA damage, particularly in the Base Excision Repair pathway. Toward this goal, we generated yeast strains containing mutant Spn1 proteins Spn1-K192N (which contains a point mutation) or mini-Spn1 (which contains only the core domain) by plasmid transformation and coupled these with

deletions of genes involved in DNA damage repair pathways. These newly generated strains were then tested in growth assays under various DNA-damaging conditions to determine the effect of Spn1 mutation. Here, we discuss our methods of transformation and report our initial discoveries, which have the potential to shed light on a new function for Spn1 in DNA damage repair.

Formulation Predictivity: A Design of Experiments

Barret Davidson, Drew Dossett, and Grayson Hurst

The traditional "shotgun approach" for designing coatings' formulations is an expensive and outdated approach. In many labs, an experienced formulator performs these experiments because s/he just knows what would work; however, after the experienced formulator leaves the company, the company is left in need, especially with the large industry in-flux of millenials graduating college with little to no practical experience. This project illustrates how educating undergraduates about design of experiments could be a stopgap in the demographic, practical, and intellectual shifts in industry.

Our project consists of designing an UV-cured silicone release coating with ultra-low release values. Release values are a measure of the cohesive interaction among the coating components and the adhesive interactions of the coating with another substrate. If we can minimize the adhesive interactions and maximize the cohesive interactions, we should produce an ultra-low release coating. The contact angle of a pure liquid on a coating surface relates the adhesive and cohesive interactions and could therefore be used in a design of experiments to predict the structure-property relationships of a multicomponent mixture (e.g., a coating) specifically using an equation proposed by Cassie and later modified by Whitesides. We will demonstrate how we performed the design of experiments and then tested the efficacy thereof to produce UV-cured silicone release coatings with varied/customizable properties.

Session D2: Math in Action - Alumni Conference Room

Pinochle Families: An Application of Combinations of Multisets with Finite Multiplicities

Jordan Miller

Although calculating probabilities with a standard deck of cards is relatively straightforward, computing probabilities in a pinochle deck requires a different approach due to the duplication of cards within the deck. Using the ideas of combinations and multisets, the number of unique hands in which a family (sometimes called a run) can occur can be computed. The number of unique hands containing a family will be calculated using the inclusion exclusion principle to motivate combinations of multisets with finite multiplicities, specifically a multiplicity of two due to the duplication of cards in a pinochle deck. While exploring if each hand is equally likely, the probability of a family can also be evaluated. Then, this approach is analyzed through a simulation of this event.

How to Solve "Lights Out!"

Christian Lovins

We analyze the popular game "Lights Out!" using linear algebra. We provide conditions for solvability and show that each puzzle has four solutions. Our techniques are matrix

multiplication and Gaussian elimination to produce row operation equations that act as a solver. We provide several examples and also utilize Microsoft Excel to replicate and solve the game.

Operations With Rational Numbers and Algebra Readiness

Jaclyn Barker

Operations with rational numbers are arguably one of the most foundational and important concepts in mathematics, yet students often find these operations to be challenging. These students who struggle in working with rational numbers continue on to struggle in algebra and beyond. In this presentation, we will examine data that supports the hypothesis that students' competency with rational numbers, specifically decimal numbers, has an effect on algebra readiness. Additionally, I investigated student and teacher understanding of decimal multiplication by interviewing eight sixth grade students and their respective mathematics teachers. The results of this study aided me in examining different teaching strategies for decimal multiplication and brought light to students' lack of conceptual understanding of decimal multiplication. Through research, I have determined that students have procedural fluency in regards to decimal multiplication, but they lack the proper conceptual understanding needed to continue on to higher levels of mathematics. The research I have gathered will help me in determining where we have gone wrong with traditional teaching strategies, and with this information, I will determine a teaching strategy of decimal multiplication that promotes adequate conceptual understanding and algebraic habits of mind.

The Effect of Non-Normally Comparing Confidence Intervals On Two Populations

Cindy Mazariegos

More emphasis is being placed on the estimation of effect size using confidence intervals to analyze statistical results. A method that is often used to measure the shift in location between two populations is based on the pooled Student's t test. The use of these t-intervals is based on the assumption that the variable of interest is normally distributed. When this assumption is not met the confidence intervals might not perform as expected. Standard statistics textbooks, however, state that the confidence levels are relatively stable if the populations are somewhat mound-shaped. One alternative to the t-interval is the Hodges-Lehmann (HL) confidence interval, based on the Wilcoxon rank-sum test. The primary aim of this study is to estimate the empirical coverage for t-intervals and HL-intervals when sampling from normal populations as well as from a variety of non-normal populations. In addition, the widths of these confidence intervals will be compared. SAS software was used to simulate random samples of size $n=10, 20, 30$ and 40 from two populations. The two populations were both distributed as either normal, Laplace (symmetric heavy-tailed), Cauchy (symmetric, extremely heavy-tailed), or Weibull (right skewed) random variables, and were shifted by a distance of $0, 0.75$ or 1.50 interquartile ranges. Each of these 48 conditions were replicated 5000 times. For each condition 95% confidence intervals for the shift between the two populations were computed using the two-sample pooled t-test interval and the Hodges-Lehmann interval. The empirical coverage and the average width for each type of interval was computed for each interval type. As expected, the empirical coverage for both the t-intervals and the HL-intervals was approximately 95% when sampling from the normal distribution. For the non-normal distributions, the coverage was at or above 95%. The t-intervals were generally narrower than the HL-intervals for normal populations. When sampling from the Laplace distribution, the t-intervals were generally wider

than the HL-intervals. For the Cauchy distribution, the t-intervals were markedly wider. For the Weibull distribution, the t-intervals were overall slightly wider. Although the empirical confidence levels for the t-intervals were very close to 95% for non-normal distributions, it appears that the cost of this stability is an interval that is much wider, much less precise. The more heavy-tailed the population the more this is true. For the heavy-tailed distributions the HL-interval provides a much more precise estimate of the difference between two populations.

Are High School Proofs Childproof? A Lesson Study on Mathematical Proof
Janessa Beach

Over two decades ago, researchers in the field of mathematics education detected a deficiency in students' abilities to write mathematical proof. Researchers have since ascribed these deficiencies to be the result of several misunderstandings carried by students. While the source of this weakness in mathematical proof has been evinced, no research on how to combat this shortcoming within the classroom exists. Therefore, this research utilized Lesson Study, a Japanese form of educational research and professional development, to satisfy this hole in mathematics education research. The designed Lesson Study focused on altering students' distinct confusion of the relationship between proof and quantitative analysis as well as identifying the misconceptions that most encumber students in their proof writing. This Lesson Study was taught to fifty-two students enrolled in geometry courses at a West Texas high school.

Session D4: Sex and Gender - AT&T Theater

Mother Ganges Wept: Rape Culture and Sexual Violence in India
Maggie McAlister

India has long been a hotbed for sexual crimes. While these crimes are by no means unique to the country, citizens are becoming more and more vocal on the subject, calling for change. However, as we as a global community have learned time and time again, it is difficult to root out a problem that has steeped for centuries. In my paper, I analyze the historic, religious, and statistical aspects of India's rape culture in hopes that more people will hear the call to action - while many have heard of Delhi's 2012 gang rape, few know much else on the topic. I hope to change that. My research methodology included use of primary sources (mostly ancient religious texts and interviews) as well as secondary as found in databases and on local and international news sites. I have concluded that, while the progress to a safer India seems slow, it is steady, and change is happening as you read this abstract.

Women and Power in the Church, Family, and Work Setting
Elizabeth Watters

Power is a defining aspect of all interpersonal relationships. Although it can be an elusive idea to capture when looking at individual relationships, power allows us to identify key roles and functions in our interactions with other people. In *The Balance of Power in Dating and Marriage*, Peplau and Campbell define power as one person's ability to influence the behavior of another to achieve personal goals. This article will maintain a narrowed view of power as it relates to woman and the roles they hold. The main focus of this qualitative study is to see how women view and balance their allotted power within their roles in the church, family, and work settings. The main factors taken into consideration include the church's views and expectations for women in their home and work environment, their spouses as well as personal beliefs about

roles, and the amount of power they have in their current work position. The main concern being how the church, family, and career setting affect women's views on power as well as the amount they hold in each context.

Women's Rights in Iran's Legislative Documents: A Critical Analysis of the Constitution, Civil, and Penal Code
Joyce Schuster

This project uses qualitative content analysis to examine Iranian legislation of the constitution, penal code, and civil code to uncover manifestations of interacting gender bias. These documents, serving as legal basis for the Iranian legal system, create a framework to view female identity and participation in society. The project contends that all Iranian legislation must be understood through the Islamic principles outlined in the constitution. These principles of equality and justice are unequally distributed in various applications of the civil and penal code within Iranian society. This paper argues that while these documents support some notions of gender equality, the writings overwhelmingly fuse female identification within the family as a static identity, thus harming gender equality. The paper juxtaposes modern Iranian policy to the specific legislative documents to illuminate the large gap between literature and application. The articles of the penal and civil code dictating marriage, divorce, sexual duty, veiling, and inheritance are all critiqued under a rhetorical framework; they contend that the distinct difference between protections and sentences regarding gender is key in creating a society of discrimination which spills into all spheres of government interaction. I use critical theory to present the issues of social identification and equality. This paper argues that Iranian legislation helps in promoting a social stigma against untraditional feminine roles and that the penal and civil codes both provide ample examples of gender discrimination leaving women in roles of submission and economic dependency. This research demonstrates the underlying impacts of legislative formation and the social stigmas that result from gendered language.

A Demographic Case Study and Comparative Analysis of Sexual Violence and Texas Bordertowns
Savannah Hostetter

Border towns are often assumed to be fewer secure regions in all areas of crime including sexual violence. These cities young, uneducated, and economically-disadvantaged communities often parallel with the backgrounds and demographics of many sex offenders. Each year, the Texas Department of Public Safety publishes a sex offender's registry that contains a mere six-page report about some of the basic demographics of offenders. By using the registry, City Data, and Zillow.com, this essay will discuss the findings of my in-depth analyze of the registry in relation to the demographics of Brownsville, McAllen, and Laredo, Texas. It will determine if the demographics of communities along the Rio Grande merely correlate with the common profiles of offenders or if they are a causation, fostering an atmosphere prone to produce sexual predators. This research is significant because it raises awareness to a pressing issue and provides information that could help create safer communities among the rapidly growing Texas cities that line the border.

Young adults' use of texting shorthand on Facebook
Hailey Hendricks

The presence of shorthand in various electronic platforms has inspired concern about the future of formal writing skills. This study examines young adults' (ages 18-24) use of texting shorthand

on Facebook, attitudes towards texting shorthand, and other variables. An online snowball survey (N=78) included 50 questions addressing attitudes toward and use of texting shorthand on Facebook, reading and writing habits, presence of professional friends on Facebook, and a short grammar, spelling, and punctuation test. Results suggested that young adults do not use shorthand very often on Facebook and generally have negative attitudes towards it. Use of abbreviations and acronyms was the most popular form of shorthand that respondents reported. Shorthand use in young adults does not appear to have a relationship with grammar facility. However, correlation showed that as scores on the grammar test increased, attitudes toward texting shorthand use became more negative. Greater frequency of reading by participants correlated with decreased levels of shorthand use, and more negative attitudes toward shorthand use correlated with less shorthand use. No relationship was found between use of texting .