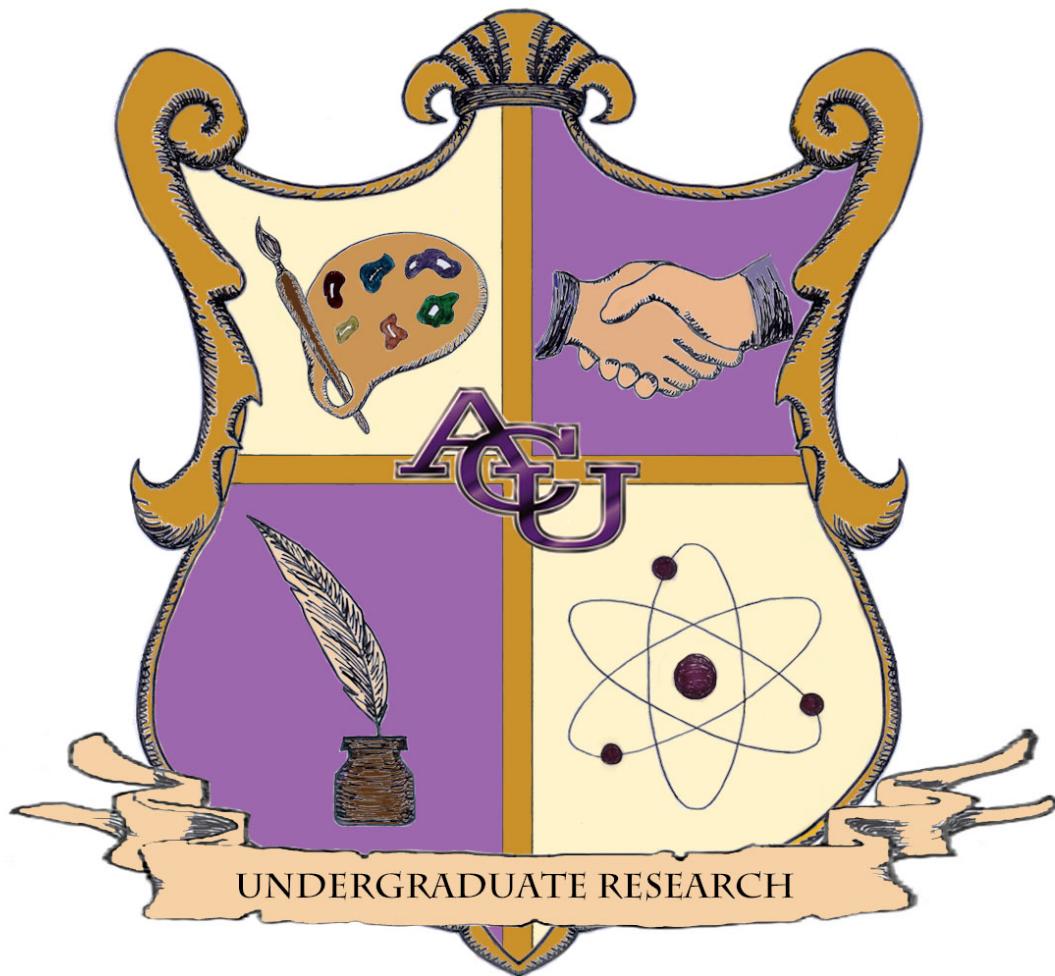


2016 ACU Undergraduate Research Festival Abstracts



April 5, 2016

MORNING SESSIONS

Tuesday, April 5, 8:30 – 9:20 AM

Session A1: Studies in Culture - McCaleb Room Zone A

Study Abroad's Influence on Cultural Perceptions

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 Abilene Christian University's Study Abroad Program in the fall semester of 2014, the researcher became curious about the influence that intercultural competence has over the experience as a whole. This study involved an investigation into students studying abroad with Abilene Christian University in order to determine whether or not they felt more interculturally competent after living and studying in a foreign country for one semester. A survey was created to examine students' preexisting and post-Study Abroad attitudes and perceptions about the home culture and cultures they explored during their international travels, as well as how the host country's culture influenced them. Results suggested that, overall, students studying abroad believed they were able to look at U.S. culture more critically and had gained a more informed perspective of the world.

French Immigration and Cultural Dissonance

Parker Pollard

This research attempts to analyze the immigration problems facing France. This subject is a complex one, deeply mired in the history of France and its continuation of ideas into the twenty-first century. Thus, historical context, political rhetoric, and cultural biases all greatly contribute to the discussion revolving around migration to France. This juxtaposition between French ideology and actual practice reveals ways in which French culture can be seen as oppressive toward immigrant populations, while also creating a cultural dissonance among ethnically French citizens.

Professionalism and Ethics: A Guided Study on Ferguson, Missouri

Chanel Brown & BaiLee Evans

In this presentation, we will be talking about the unconstitutional policing that has taken place for many years in Ferguson, Missouri. Many of these unethical policing methods have affected African-Americans. We have found statistical analysis to prove this unfair treatment of African-Americans in this city. We have also examined eye-witness accounts and how these events have affected the community's view of the Ferguson Police Department. We have also provided recommendations for future police-community relations in Ferguson. We explain what other police departments have done to establish a cohesive bond with their residents and how Ferguson can learn from these other police departments. We also demonstrate how difficult it is to obtain data information about the use of force by police and state the need for legislation and programs in order to enhance data collection of use of force by police nation-wide.

Session A2: Issues in the Classroom - McCaleb Room Zone B

Rewiring the iBrain: The Effects of Technology in the Classroom

Samantha Studwick

Within the past decade, technology has become an integral aspect of American society, with teenagers and young adults at the forefront of this culturally-defining norm. Many high schools are integrating technology into the classroom to further learning; however, adolescence is a complex period of development where the brain is easily influenced by external stimuli, such as technology. My research was aimed at exploring the effects of technology in the classroom as it relates to high school-aged adolescents.

A vast majority of students have developed an excessive reliance on high-tech gadgets, such as the iPad, and are not fully engaging with nor understanding the presented content. Research has proven that adolescents are prone to developing internet addiction, and in turn, mental health issues, such as anxiety and depression. A review of literature has led to the conclusion that relationships are also at risk due to an emphasis on mediated communication and the associated rejection of interpersonal communication. My own survey of 40 high school students in Pennsylvania confirmed that iDevices and systems of the like offered little benefits to students and proved to be more distracting than useful.

Schools are finding it more cost effective to swap textbooks for iPads, even at the cost of students' health, and the implications for this trend are more detrimental than what society perceives. As a result, teachers should focus more on engaging students one-on-one in a less stimulating environment, but should not eliminate technology in its entirety. Because technology is inextricable from society, the solution is not to avoid technology, but instead to learn how to effectively interact with technology while, at the same time, maintaining exposure to the "real" world.

Understanding the Decision Making of First Year Teachers Regarding Reading Assessment and Instruction

Hannah Lowry

During this session, the presenter will share the findings of a study focused on determining what influences the reading assessment and instruction of five first and second year elementary teachers teaching in Texas. Many studies have shown that it can be challenging for beginning teachers to carry out the teaching practices learned in their preservice programs into the classroom. In order to understand how first year teachers make assessment and instructional decisions, we conducted a study in which we interviewed and observed participants three to four times throughout the course of one year. The participants kept monthly journals about their reading assessment and instructional decisions and collected pertinent documents such as policy statements and lesson plans. As we collected data from interviews, observations, and artifacts we categorized the findings into themes using the constant comparative method. Five distinct themes emerged from the research. First, we found that congruence between preservice teachers' education programs and their teaching experiences in their first year makes a difference in their reading instruction and assessment. If the instructional practices that the teachers learned in program are supported in the school where they teach, they are more likely to be able to effectively implement them in their classrooms. Second, we found that a lack of congruence between preservice program and their teaching experiences makes it challenging to incorporate what was learned in program into the classroom. Third, we found that team planning influences many of the participants' decisions about reading assessment and instruction, sometimes encouraging the use of progressive methods and sometimes not. Fourth, many of the participants drew on a variety of materials, sometimes an overwhelming amount that prevented them from implementing the balanced literacy approach the district was supporting. Finally, administrators can play an important role in encouraging progressive methods.

Graphic Terror: Comic Books in the Classroom

Maggie McAlister

In Graphic Terror, I discuss the importance of alternative modes of literature in high school Language Arts curriculum in light of current trends with youth and in conjunction with recent pedagogical study. My research methods include reviews of the current literature in the field pertaining to the use of graphic novels in the classroom, TEKS and Common Core Standards, and interviews with current HS LangArts teachers and recent high school graduates. My presentation will close with an example of a lesson plan implementing a graphic novel as credible literature in a high school classroom.

Session A3: Cultural Issues - Alumni Conference Room

Elders in Black and White: J.S. Winston and the Impact of Institutional Racism on Church Leadership

Ian Nickerson

This research explores J.S. Winston's response to the impact of institutional racism on church leadership. In his teaching, Winston emphasized the radical congregational polity of New Testament Christianity and the importance of well-trained leaders including elders and preachers in accordance with the traditional doctrine of the Restoration Movement. But the question arose as to why so few black congregations lacked elders as compared with the majority of white congregations that had elders. The project analyzes four primary sources written by Winston in 1973 and an essay published by Winston in 1947, all delineating the factors that hindered the development of leaders in the black church. Some secondary sources show the congruence between Winston's historical claims and those of other notable historians of the Restoration Movement. Winston highlighted factors that are often overlooked when considering the disparity of leaders between black and white congregations. The intent of this research is to understand the history of institutional racism and paternalism that retarded the development of leadership among the African American Churches of Christ. The paternalistic mindset of white church members in the 20th century left a legacy of skepticism and contempt among many in the black church. The research acknowledges that institutional racism has subsided, but the residue of racism lingers.

Whispers of Wilderness: Reconciling Humanity and Nature

Michelle Weidenaar

Early American hostility toward the land lessened as the wilderness faded before the expansion of civilization, but new conceptions of the wilderness have failed to fully reconcile humanity and nature. Reconciliation between humanity and the land must come through a common identity as creation in mutual submission to the creator.

Roderick Nash, in his *Wilderness and the American Mind*, presents American colonists in direct conflict with the land, fighting for survival. This initial relationship of antagonism set a precedent of dualistic estrangement. Although this antipathy faded over time, the dualism remained. In response, Nash proposes a willing submission to the land.

Unfortunately, as William Cronon argues in his "The Trouble with Wilderness," this approach only reverses the positions of power, instead of reconciling humanity and nature. Cronon proposes that Americans reject definitions of wilderness which require the absence of humanity because such definitions inherently demand the estrangement of humans and nature. Rather, he calls for recognition of the land's "otherness" as people interact with mountains as well as neighborhood parks. In this way, Cronon's solution attempts to step outside of the dualistic relationship entirely.

While more helpful than Nash's solution, Cronon's proposal falls short of entirely reconciling humanity and nature. Reconciliation cannot simply be achieved through recognizing the "otherness" of the land. The estrangement of humanity and the American wilderness did not come through an ignorance of the land's own voice, its "otherness," but through the silencing of that voice.

A conception of wilderness founded on humanity and nature's common identity as creation redirects the submissive acts inherent in the nature-human duality toward God, allowing the two to come together. Humanity cares for the land on behalf of the creator. In turn, the land's "otherness" points humanity toward the unmediated power of the divine.

H Ανάρρωσις ἀρετής: The Parthenon Marbles and Greek National Identity

Savannah Weeks

During my semester abroad, I fulfilled two travel goals: to visit the British Museum and see the Parthenon Marbles; and to visit Athens, Greece, and explore the marbles' original location. After my visit to both places, I was faced with a moral dilemma. Although I can put forward strong arguments for and against repatriating the Parthenon marbles to Athens, I originally believed they were best kept in Britain. I have held this belief ever since I first began following and research this debate in high school. However, after visiting Athens and experiencing Greek national pride directly, I began to see the matter differently, questioning whether the English have the right to these artifacts. Along with the Greek pride, called arete ($\alpha\acute{ρ}\epsilon\tau\acute{\eta}$), I also experienced the devastation of the Greek financial crisis. These two issues cause my moral dilemma, both pulling my opinion a different way. Therefore, I decided to begin looking at the problem objectively. My paper analyzes the debate from my perspective of direct experience, looking not only at historical context, but also the legal, political, and societal aspects that underscore the importance of this problem for political discourse and Greece's place in the European Union.

Session A4: Culture and Conflict - LYNAY Classroom

Homosexuality and Gender Expression in India

Chelsea Peer

This paper compares the current attitudes towards gay, lesbian, and transgendered Indians with pre-colonial Indian society and explores the roots of modern-day discrimination. It is designed to give an overview of the current state of members of the LGBT community—specifically gay, lesbian, and transgender Indians. It puts this in contrast with the status of those exhibiting the same or similar identities in pre-colonial India by looking at sexuality and gender expression as it is portrayed in both ancient Hindu scriptures and in Indian culture prior to exposure to Western influences compared with Indian views of sexuality after the British Raj. The paper uses examples from Hindu scriptures such as the Kamasutra and Padma Purana as well as recent Indian news articles and works and studies of scholars relating to this subject. Opponents to pro-LGBT movement in India claim that homosexuality is an import of the West and, therefore, "un-Indian." However, it would appear that homophobia, not homosexuality, is the Western import into India.

Clash of Civilizations: Fact or Myth?

Kendra Oregon

This project explores the thesis of Samuel P. Huntington's Clash of Civilizations (1996), which claims that future conflict post-Cold War will be driven by cultural differences thus resulting in being the greatest threat to world peace. In order to test the validity of Huntington's thesis, this study consists of analyzing three wars: U.S. War in Afghanistan, Second Congo War, and the Bosnian War. These wars were used as a sample to see if Huntington's conflict thesis plays out in history. By understanding global conflict in the world context there will be a further understanding of fundamental international relations throughout the world. Thus the importance of exploring Huntington's thesis goes beyond providing a new perspective by bringing attention to the importance of the growing influence of culture in the world.

Homosexual Adoption in Today's Society

Federica Vinera

There are over 120,000 orphans in the United States, and an estimated 400,000 children do not have a permanent family. Adoption offers one possible way to address this issue. Placing these children with adoptive families could combat the feelings of abandonment they experience and possibly prevent developmental damage. Many would readily agree that every child deserves a life filled with the love and guidance that a stable family can provide; but experts do not agree if homosexual couples can provide that stable, healthy environment.

Homosexual adoption is a relevant, hotly-debated social-justice issue. Unfortunately, entrenching in "black and white" positions has led to an impasse in the debate. Some argue that homosexual couples are not fit to provide for a child's needs as either the maternal or paternal role model would be missing. Others counter that missing of one of the genders is not a barrier for the child's social and emotional growth.

Analysis of both sides of the argument reveals, interestingly, that personal beliefs are often stronger than hard evidence. My proposal moves past the stereotypes that have polarized the issue; it establishes the well-being of the child as the standard for judging what is just or unjust in these situations.

Tuesday, April 5, 9:30 – 10:50 AM

Session B1: Analyzing Verbal and Nonverbal Messages - McCaleb Room Zone A

Cellphone Use as Nonverbal Communication

Hannah Chappell

This study investigated the motivations and interpretations of cell phone gazing, and searched for gender differences in the frequency of the behavior. The instrument used in this study was a survey based on Nakamura's (2015) communication model regarding cell phone gazing. The participants in this study included 94 college students. These participants showed no statistically significant gender differences in the frequency of phone gazing. It was found from this study that people are more motivated to intentionally look at their mobile phones when they are alone in a public place than when they are in the company of familiar persons. This study also revealed that among the 94 participants, negative interpretations are the most common when others are seen engaging in phone gazing.

For Those Who Can't Speak

Andrea Archer

The purpose of the study was to explore group differences between monolingual and bilingual speech-language pathologists (SLPs) regarding the diagnosis of language impairment, secondary language impairment, and bilingual phenomena. Additionally, certain research questions were addressed such as who was more likely to diagnose primary language impairment (PLI) in ELLs or bilingual phenomena as a diagnosis, and whether or not training had an impact on these decisions. A survey was distributed to various groups of speech-language pathologists asking for their insight on these questions, and the results were analyzed and discussed. We discovered that formally trained bilingual SLPs appeared to be more likely to complete the entire survey. Also, formally trained bilingual SLPs seemed to be more confident when selecting diagnoses than their monolingual counterparts.

Secrets Out: An analysis of Ashley Madison's Hacking System Crisis

Itzel Garcia De Alba

The study analyzes the image restoration strategy of the Ashley Madison data breach in July of 2015. Ashley Madison announced a paid delete option for their online dating service, but instead kept the information regardless of the service promised. A hacking group, self-identifying by the name of the "Impact Team," managed to obtain all Ashley Madison user information and release it to the web public. The press release by Avid Life Media, the parent company, used several image restoration strategies such as: bolstering, minimization, mortification, compensation, corrective action, and shifting the blame. However, these strategies were ineffective and did not restore Ashley Madison's image. The findings indicate the Ashley Madison's strategies were ineffective because they increased ambiguity, decreased credibility, and lacked to pay attention to the stakeholder's concerns.

Moral Foundations of Presidential Primaries: An Analysis of Partisan Campaign Language

Courtney Tee, Barrett Corey, & Wesley Robbins

In political campaigns, proposals about solutions to issues can often be traced to a presumed moral intuition about what is right and wrong for society and individuals. While the modes of arriving at these goals differ widely, the undercurrent of moral notions in modern political life cannot be ignored. Politics is, after all, the tangible mode by which we decide what is good and right for a community, a decision that cannot be arrived at apart from an understanding of right and wrong that may be applied to everyone in the form of policy and law. Little research has been done previously on the intersection of moral intuition and political action. This study will examine the moral language used in the 2016 presidential primaries in order to hypothesize about the fundamental moral concerns that drive contemporary political action. This will be accomplished by coding the online issues pages of 2016 presidential candidates for moral language. These data will then be examined through the perspective of the Moral Foundations Theory, as revised and discussed by Jonathan Haidt, which serves as the best available synthesis of psychological and structural moral theories. Moral Foundations Theory lays out six moral continuums that make up the foundation of the world's diverse moral systems—care/harm, liberty/oppression, fairness/cheating, loyalty/betrayal, authority/subversion, and sanctity/degradation.

Aggression and Maternal Discipline in Adolescence

Fabiola Vargas

The present study investigated the relationship of aggression in adolescence and maternal permissive parenting style. A major risk factor for a plethora of negative outcomes for adolescents is aggression. Research on Baumrind's parenting styles has

previously shown authoritarian parenting styles are associated with aggression; however research on the permissive parenting style is scarce. The current study investigated maternal parenting style and aggression among adolescents ages 13-17. The sample came from the Boys and Girls Club "Teen Night" program in Abilene, Texas. The measures used in this study were the Aggression Questionnaire (Buss & Perry, 1992) and Parenting Style Questionnaire (Robinson, Mandleco, Olsen, & Hart, 1995). Maternal figure's permissiveness and gender differences were studied to find a correlation with aggression. The results did not find a relationship between maternal permissiveness and adolescent aggression. Adolescents who scored higher on the measure of SAMD, which measured adolescent aggression did not correlate with MAT, which measured maternal permissiveness $r(20) = -.046$, $p = .42$. This was true as a sample as whole and also when the data was analyzed by gender. Results also did not correlate for adolescent boys, $r(9) = .197$, $p = .61$ or for adolescent girls, $r(11) = .003$, $p = .99$.

Session B2: The Chemical Element Osmium - McCaleb Room Zone B

Synthesis and Characterization of Osmium (I) Carboxylate Dimers

Kylie Wilson & Erica Lambert

While there has been substantial osmium cluster research, there are only eight published x-ray crystal structures containing osmium (I) dimers with bridging carboxylate ligands. Of these dimers, there is only one asymmetric structure, $[\text{Os}_2(\mu\text{-acetate})_2(\text{CO})_5\text{Cl}]$, with a negative charge; there are no published asymmetric, neutral structures. In order to expand the scientific community's basic understanding of the chemical properties of osmium, we have synthesized several new osmium(I) dimers, attempting to create neutral, asymmetric compounds. $\text{Os}_3(\text{CO})_{12}$ was used as the starting material, and we followed a published microwave procedure (1) to produce $[\text{Os}_2(\mu\text{-R})_2(\text{CO})_6]$ ($\text{R} = \text{acetate, propionate}$). Via microwave reflux, $[\text{Os}_2(\mu\text{-R})_2(\text{CO})_5\text{THF}]$ was produced. The THF ligand was subsequently replaced with various phosphines to form the desired mono-substituted, and therefore asymmetrical, products, $[\text{Os}_2(\mu\text{-R})_2(\text{CO})_5\text{L}]$ ($\text{L} = \text{P(p-tolyl)}_3, \text{PPh}_3, \text{PMePh}_2, \text{PEtPh}_2, \text{PTA, TOP}$). Symmetrical carboxylate $[\text{Os}_2(\mu\text{-R})_2(\text{CO})_4\text{L}_2]$ dimers were by-products. Here we report the infrared characterization of the mono- and di- substituted products purified from our reactions, and the x-ray crystal structures of the new osmium(I) dimers, $[\text{Os}_2(\mu\text{-propionate})_2(\text{CO})_4(\text{P(p-tolyl)}_3)_2]$, $[\text{Os}_2(\mu\text{-acetate})_2(\text{CO})_5\text{P(p-tolyl)}_3]$, and $[\text{Os}_2(\mu\text{-acetate})_2(\text{CO})_4(\text{PPh}_3)_2]$.

Osmium-Containing Chemotherapeutic Drugs

David Marolf

The success of the platinum-containing anticancer drug cisplatin has spurred the search for other organometallic chemotherapeutic agents that might be even more effective than cisplatin. Other platinum group metals, including rhodium, ruthenium, and osmium, have been of particular interest. I will present the most recent and promising findings of osmium-containing organometallic drugs from other researchers before presenting the research that we have conducted with respect to new osmium complexes. We have been working on the synthesis of water-soluble triosmium clusters and redox-active diosmium complexes that we hope can be used to treat cancer in the future. Two of our new compounds that we will discuss are the watersoluble $\text{Os}_3(\text{CO})_8(\text{PTA})_4$ and the heterometallic $\text{Os}_2(\text{CO})_6(\text{O}_2\text{CC}_5\text{H}_4\text{FeC}_5\text{H}_4\text{CO}_2)$.

New Triosmium Clusters with PTA Ligands

Kristen Brehm & Amanda Dugan

The inadequacies of current chemotherapeutic agents have led to the development of novel anticancer compounds with alternate modes of action. Recent studies have shown that mononuclear osmium complexes with 1,3,5-triaza-7-phosphadamantane (PTA) ligands have the potential to serve as new antitumor agents with similar anticancer activity as cisplatin, the most widely used drug in cancer treatments. Despite this success, no polynuclear osmium complexes with PTA ligands have been synthesized until now. Using microwave heating, we have synthesized the first examples of these clusters, $\text{Os}_3(\text{CO})_{11}(\text{PTA})$ (1), $\text{Os}_3(\text{CO})_{10}(\text{PTA})_2$ (2), and $\text{Os}_3(\text{CO})_9(\text{PTA})_3$ (3). Complexes 1 and 2 are quite insoluble in water, and so their future as chemotherapeutic drugs is limited, but complex 3 is slightly soluble in water. Complexes 1-3 have been characterized with IR and NMR spectroscopy, and X-ray crystallographic analyses have been carried out on complexes 1 and 3. Furthermore, multiple solvates of both complexes 1 and 3 have been obtained, some of which show interesting hydrogen bonding properties. We will describe the molecular structures and properties of these three new complexes.

Syntheses of Water-Soluble Osmium Carbonyl Clusters

Joel Jackson & Soo Hun Yoon

Organic-osmium compounds have recently become an area of study in the search for novel anticancer agents. Water solubility is a necessary property for effective and practical chemotherapeutic drugs. We have been investigating the reactions of 1,3,5-triaza-7-phosphadamantane (PTA), a water-soluble phosphine ligand, with $\text{Os}_3(\text{CO})_{12}$ with the goal of producing new water-soluble osmium carbonyl clusters to serve as potential antitumor agents. We were able to synthesize two such cluster complexes: $\text{Os}_3(\text{CO})_8(\text{PTA})_4$ (1) and $[\text{Os}_3(\text{CO})_9(\text{PTAH})_3]\text{Cl}_3$ (2), where PTAH is the protonated derivative of PTA. Complex 1 and $\text{Os}_3(\text{CO})_9(\text{PTA})_3$ were synthesized by reacting $\text{Os}_3(\text{CO})_{12}$ with excess PTA at high temperatures in a microwave reactor. $\text{Os}_3(\text{CO})_9(\text{PTA})_3$ was then treated with hydrochloric acid to form complex 2. Both complexes readily dissolve in water at neutral pH. X-ray crystallographic analyses and supporting spectroscopic data have confirmed the

structures of complexes 1 and 2. Their syntheses, solubilities, and structures will be described. The next stage of this research project is to test the anticancer activity of these new complexes.

Session B3: High Energy Nuclear Research – Alumni Conference Room

Using a Neural Network to Detect Dimuons for Fermilab Seaquest

Paul Carstens

The SeaQuest Fermilab experiment aims to gain further insight into the internal structure of the proton as the current models have not yet fully accounted for the mass, spin, charge, and makeup of quarks and antiquarks. SeaQuest collides a high energy proton beam in a 4 second pulse once per minute with seven different target elements, primarily liquid hydrogen and liquid deuterium. The subatomic particles created by these events are monitored by four detector stations that employ the use of fast-acting, lower resolution detectors called hodoscopes, and slower wire chambers capable of producing more precise position measurements. In order to separate the useful data produced in the targets from non-interesting reactions and background noise, we use the fast acting hodoscopes to screen potentially useful events to keep. There are approximately 10 trillion interactions in each beam pulse, but the events of interest will be contained within only a few thousand of those interactions. Here is presented a study of a neural network that can learn to properly discern these events from background by associating hodoscope results from real data with results from data sets that have already been analyzed and evaluated. By doing this, we could efficiently replicate existing results while alleviating the processing time needed.

Testing of Advanced Particle Detectors for the Next Generation Particle Collider

Hannah Hamilton

As we learn more about the internal structure of the proton it is clear that some properties can be easily explained by just considering valence quarks, such as electric charge, while others cannot, such as intrinsic angular momentum or spin. Much progress has been made in understanding the spin of the proton, but further investigation will require new particle colliders that have higher energies and different particles. The Electron Ion Collider (EIC) has been proposed to meet those needs. A new spectrometer with advanced detectors will be needed for use with the EIC. These new detectors will require excellent identification of particles that result from the collisions. One possible detector is a glass multigap Resistive Plate Chamber (mRPC). Because of their constructions, mRPCs are able to detect the high energy particles that result from the collisions. To test the effectiveness of the mRPC, a test stand was assembled. The construction, the method of testing, and the test results of mRPCs will be presented.

Measuring the Density of Liquid Targets in the SeaQuest Experiment

Zhaojia Xi

The SeaQuest (E906) experiment, using the 120 GeV proton beam from the Main Injector at the Fermi National Accelerator Lab (FNAL), is studying the quark and antiquark structure of the nucleon using the Drell-Yan process. Based on the cross section ratios, $\sigma(p+d)/\sigma(p+p)$, SeaQuest will extract the Bjorken-x dependence of the \bar{d}/\bar{u} ratio. The measurement will cover the large region ($x > 0.25$) with improved accuracy compared to the previous E866/Nusea experiment. Liquid D₂ (LD₂) and Liquid H₂ (LH₂) are the targets used in the SeaQuest experiment. The densities of LD₂ and LH₂ targets are two important quantities for the determination of the \bar{d}/\bar{u} ratio. We measure the pressure and temperature inside the flasks, from which the densities are calculated. The method, measurements and results of this study will be presented.

Development of an Electron Ion Collider Detector Test Stand

Cecily Towell

Although much is known about the complex structure of protons and neutrons, we continue to lack understanding of some of their specific characteristics. One of these characteristics is called spin. In particular, it is unknown how all of the parts that come together to form protons and neutrons (collectively referred to as nucleons) combine together to produce the overall nucleon spin. In order to allow for further effective study of this area of physics, a new kind of accelerator is being designed. This accelerator, called the Electron Ion Collider (EIC), will enable physicists to take a unique look into the spin structure of nucleons. Collisions that will occur in this collider will require significant improvements in detector performance. This includes Time of Flight (TOF) detectors, which take careful timing measurements of particles in the collider. To improve TOF detector efficiency and accuracy, new TOF designs have been developed with the potential of improving the resolution of the detector by a factor of 10. Testing of this new design is necessary to fully understand its capabilities and to make improvements where possible. This summer, we assembled a cosmic ray test stand to make careful measurements so that the timing capabilities of the new TOF design could be determined. Systematic studies of the stand itself were necessary to verify the accuracy of our setup. These studies and their findings will be presented.

Data Reconstruction Analysis (E906/SeaQuest)

Lauren Selensky

SeaQuest is designed to observe the characteristics and behavior of ‘sea-quarks’ in a proton by reconstructing them from the subatomic particles produced in a collision. The 120 gigaelectronvolt particle beam from the facility’s main injector collides with a fixed target and then passes through a series of detectors which records information about the particles produced in the collision. However, this data becomes meaningful only after it has been processed, stored, analyzed, and interpreted. Several programs are involved in this process. SeaQuest uses a control program to simulate dimuon production and background noise from the beam. Dr. Rubin developed a reconstruction program that reads wire or hodoscope hits and reconstructs the paths of potential dimuon pairs from a run. During path reconstruction, an event must meet the criteria determined by the reconstruction program to be considered a viable dimuon pair; this ensures that relevant data is retained. As a check, a comparison between a new version of the reconstruction program and the control program was made in order to see how accurately the reconstruction program could reconstruct the events created by the control program accurately. In this presentation, the results of the inquest and their potential effects on the programming will be shown.

Session B4: Issues of Diversity in Race, Gender, and Sexuality – LYNAY Classroom

Arab Feminism: History, Goals, Challenges - and a Promising Future

Andrew Brown

This study assesses the presence of feminism in the Arab world, with attention to its unique goals, strategies, and challenges. Arab feminists deal with myriad issues, ranging from voting rights to divorce law to freedom of dress. They do not seek to remove themselves from their culture, but rather to work within the framework of it. They encounter challenges from within their culture, specifically social, political, and religious pressures, yet they use these same mediums to advance their cause. They face outward challenges as well, often in the form of Western feminisms. Trying to transplant Western feminisms into the Arab world can be harmful to Arab women, muting their voices and ignoring their desires. The aim of this research is to describe Arab feminism and how it is unique, discuss how it functions in its own culture, and suggest that it be allowed to run its own special course, free from outside pressures. The voice of the Arab woman is not silent or meek, but strong, distinct, and fitted to the Arab world.

Liberated Divinity: The Experience of African American Females in Pastoral Leadership

Shaobeny Johnson

The following is a case study investigating the experience of African American females in pastoral leadership. The literature revealed focused on the calling to vocation, discrimination, and historical background of female biblical figures. The study was conducted within the focus of womanist theology, the unique blend of black and feminist theology. Semi-constructed interviews were conducted with black female pastors in order to investigate this population. A content analysis revealed the following themes: the mandate of scripture, avoidance, discrimination, importance of mentorship, and the significance of the women of old. It is submitted that churches should consider the value of the experience of these women as a tool to educate on the issue of gender equality within the church.

Gender Role Behavior and Sexual Orientation

Savannah Hipes

The purpose of this qualitative literature review is to clarify the concepts of gender role behavior (gender nonconformity) and sexual orientation, and to determine if there is evidence which supports these as separate and independent constructs. This conceptual review of 8 empirical studies includes articles found in the PsychInfo database and other sources, using search phrases such as “gender nonconformity”, “gender role”, and “sexual orientation”. A structured outline was used for reviewing each article. In the articles reviewed the constructs of gender nonconformity and sexual orientation were assessed separately. Many studies included assessments of peer reactions to individuals who possess either gender nonconformity, a gay sexual orientation, or both. I found that the reactions assessed were reactions to either gender nonconformity or to a gay sexual orientation, and were assessed independently, even if the individual being reacted to possessed both. I conclude that the independent structure of the variables and the independent assessment of each construct support the understanding of these constructs as separate and independent. A limitation of these articles is the lack of consistency in methodological structure. Overall, this literature makes clear that though these constructs are related and may overlap, they are separate characteristics and should be observed and understood independently.

Biracial Identity Salience: Family, Community, and Media Influence on Identity Formation

Andrea Wiggins, Melanie Collazos, & Samone Smith

Many models have been constructed to demonstrate how a person goes through the process of forming their identity; however, most models of identity formation focus on a single racial background. The current research seeks to expand upon these theories by applying them to individuals who identify as multiracial. The literature reviewed suggests the three most universal factors in multiracial identity formation are family, community, and media influence (Rollins & Hunter, 2013; Howarth, Wagner, Magnusson, & Summut, 2014; Ostertag, 2010). Through qualitative focus groups of individuals identifying as multiracial, we seek to understand how these three factors combine to shape one's identity. We expect to find that these factors, in various combinations, work to influence and construct a multiracial identity.

Cultural Behaviors and Attitudes for LGBTQ Christians at ACU

Diego González

The majority of our socially advanced population has given value to the words “acceptance”, and “love”. This is seen through the advocacy to eliminate all discrimination based on religion, race, gender, power status, and sexual identity. These words have birthed the longing for multicultural awareness. What happens when observing lesbian, gay, bisexual, transgender, and queer communities through a multicultural awareness lens? When examining Abilene Christian University, we recognize believers that actualize love in their everyday actions and take part in uplifting each other as members of the Christian family. However, it is unclear whether individuals of the LGBTQ community are ignored, criticized, or perhaps accepted for identifying as Christians. Are there insecurities in trying to discover gay Christian culture? It could be that they might not even have a need to live an active Christian life. Are they true believers and pursuers of His Word? I propose a study of behavior and social tendencies towards gay Christians and the response to their need to be recognized as God’s people. What is the response that we give to people that were created in His image with the same feelings of love that heterosexual Christians feel? My method of analysis: participants (disregarding sexual preference) along with licensed pastors and professionals in the social science fields will be interviewed and in person and via survey on the question of behavior towards LBGTQ Christians as experienced through educational/social life at ACU. Participants who identify as LGBTQ Christians and agree to participate will be requested for a video/audio interview and will explore in-depth behaviors and cultural experiences that have influenced their lives as they journey to find an intimate connection with God. The final product will be a digital presentation including testimonies, statistics based on the survey questionnaires, and a video presentation.

Session B5: War: Events and Issues - AT&T Theater

Crossings: The Critical Role of Railroads in the Civil War

Coleton Spruill

During the American Civil War of 1861- 1865, the Union Army and the Confederate Army utilized a multitude of available technologies, including the railroads. Although both sides utilized this same technology, each side's use of the railroads looked very different throughout the war. For the Union the railroads played a vital role fueling campaigns to penetrate the Confederacy; for the Confederacy railroads were a decisive factor in defending key locations and making large-scale movements. This paper will explain how each side used the railroads, the differences between the two sides' uses, and the different variables that led to these differences.

The Screaming Eagles in the A Shau: Major Operations of the 101st Airborne Division in the A Shau Valley, 1968-1969

Coleman Stein

The A Shau Valley lies in the eastern mountains of the Thua Thien Province, Vietnam. During the Vietnam War, it served as a major vein in the North Vietnamese supply and infiltration network, known as the Ho Chi Minh Trail. This became apparent in the aftermath of the Tet Offensive, and from 1968 to 1970, the U.S. Military launched several incursions into the Valley with the intention of crippling the North Vietnamese's supply chain. Participating in the majority of these operations was the 101st Airborne Division. The three operations that this paper discusses (Operations Delaware, Massachusetts Striker, and Apache Snow) reveal a pattern. In each instance, the 101st Airborne Division launched air assaults into the A Shau, and succeeded in capturing massive amounts of weapons and supplies, killing large numbers of the North Vietnamese Soldiers, and pushing enemy units into Laos. Despite these achievements, the People's Army of Vietnam (PAVN) would return to the A Shau following each U.S. Operation. The 101st Airborne Division's experience in the A Shau Valley represents a microcosm of the entire American war in that the U.S. Military was unable to permanently break the North Vietnamese's grip on the area.

Aaron Steward

This project is not meant to be an attempt to justify war, for such is impossible. Even if there is such a thing as a Just War, it does not change the fact that it brings forth, at best, material loss, and at its worst unimaginable human misery and depravity. It is due to this association that the concept of conflict is vilified by those who do not properly understand its importance. Instead, this project looks to better understand the base idea of conflict, and the role it plays societal interactions. Although it can lead to the evils of war if improperly managed, conflict can be of great benefit if properly dealt with. Conflict permeates all levels of society, serving to create and strengthen the bonds between people, catalyzing the push for equality, and creating competition at the economic level, to name but a few of the many possible examples.

While there are those who think that conflict is inevitable and unavoidable, its alternate school of thought begs to differ, holding that conflict as seen in humanity is something that can be reasoned past. While it may be a part of nature, our ability to reason that separates us from nature also provides us with the means to separate from conflict, but only if we try to change. In order to best cover the complexities of the topic, the feasibility of zero-conflict scenarios and the possibility of a conflict free system will also be addressed.

In short, this project will analyze the nature of conflict and its affects, as well as its alternatives. Topics such as conflict resolution, human aggression in psychology and biology, ethical approaches to fallen man, and military philosophy will be researched. The visual median will present the affects of conflict by means of flow chart.

Bennie Lee Fudge: A Voice of Pacifism in World War II Returning to the Stone-Campbell Roots

Rachel Schaad

In the midst of World War II, Bennie Lee Fudge published a tract, *Can a Christian Kill for His Government*, representing a minority voice of pacifism amongst the rising wave of patriotism and pro-war stance within the Churches of Christ. Even though Fudge was not a prominent leader in the anti-war tradition, his voice embodied the opinions reflective of the founding ideals of the Stone-Campbell Movement. This study first reviews both the central pro-war arguments Fudge refutes, as well as the primary pacifist arguments that he sets forth. Fudge's basic position is that the Bible not only does not authorize Christians to kill for their government, but explicitly forbids it. The study then traces the sources of Fudge's arguments in the traditional and conservative views of key leaders in the Stone-Campbell movement; arguments that had been lost or ignored amidst the anti-Nazi fervor of the 1940s. Finally, this project investigates the reception of Fudge's tract and the criticisms he faced. This research seeks to recover a forgotten voice of bravery within the Stone-Campbell Movement, one that took a stand against the immorality of Christians killing in war, and to show that pacifism is consistent with the ideals of the movement's founders. The current status of churches within this movement has continued to be pro-military and patriotic. Fudge's tract pushes Churches of Christ to reevaluate whether the stances they have taken truly reflect the founding traditions of their heritage. Research on pacifism within Christian movements is not anything new; Fudge himself admits he is not adding new ideas to this topic. Yet, this study is original in showing how a substantial artifact from the 1940s was able to present a cohesive argument for pacifism representative of the most conservative and traditional wing of the Stone-Campbell Movement.

Missileers of the Cold War

Jessica Price

This research presentation will discuss life for missileers in Intercontinental Ballistic Missile (ICBM) silos. Day-to-day life, what they could and could not do, what they did once their site was decommissioned and other topics will all be discussed. Some interviews from missileers will be included, either live or conducted by others and posted to reliable sources. There will also be information on how they are being used now, focusing on the case of Larry Sanders, who owns the Lawn Atlas Missile Base. He hopes to create a museum from the silo, and I will be volunteering with my class, and hopefully going on my own, to gain a better understanding of work at a silo base. To emphasize the importance and gravity of what these missileers are going through, general information about missile silos will be presented. This will include dimensions, differentiation between silos, and abilities of the various missile types.

POSTER SESSIONS

Tuesday, April 5, 12:00 – 12:40 PM

Poster Session I: Hunter Welcome Center Atrium

The Process and Importance of Film Adaptations of Novels

Angela Fogle

In my research, I examine how directors make the choices they make when adapting a book into a film; when adapting a novel into a film, directors must work within the constraints of the film media to portray the themes and ideas of a novel so the audience can come away with an understanding of the book. The struggle for directors often lies in putting the symbolic nature of the novel's words, which allow readers to imagine their own view of the world being presented, onto the screen, as

literature and movies are two such different genres. Therefore, directors tend to look at the process as more of a translation than an adaptation. They wish to convey the general themes of a novel to the screen, rather than directly putting each word in the book onto the movie screen. To apply my research and better understand the struggles directors and screenwriters face when translating a novel, I wrote a short movie script for the young adult book *As Simple as Snow*. Through the process, I learned how difficult it can be to decide what scenes to keep and cut in a movie to portray a book's theme to an audience in a timely manner.

The Effects of the First World War on European Environment and Health

Joshua DeLeon

During World War I, technology advancements allowed military leaders to equip soldiers with new weapons that involved the use of chemical warfare, trench warfare, and aerial warfare. The total war of WWI was among the leading causes of environmental destruction that has lasted to the present time and has contributed to the current environmental issues. These environmental effects include: soil degradation, contamination, and erosion from trench warfare, the geology and landscape of farmland and other former battlefields, and the dumping of unused or unwanted chemical agents and chemical waste that is being leaked into seas, the ground or in the atmosphere. After the First World War, much of Europe was left to fix the environmental destruction and deal with injured survivors; these issues only accumulated after the wars that followed this era. This war has also caused health and psychosocial problems for survivors who lived after the war, which in turn affected the postwar society. The First World War's toll on European health effected the overall population of Europe with viruses such as the Spanish flu, which used the warfare as a platform to spread this epidemic; the fertility rate of Europe also experienced a decline after the war, contributing to this factor. Lastly, psychological and health problems such as shell shock as an early form of post-traumatic stress disorder, dismembered bodies and disfigured faces caused social stress for survivors, and trench foot hindered soldiers from reentering European society because of the harmful health effects of warfare. Overall, The First World War has had major consequential effects on the environment of Europe and caused serious health problems for those involved in the war.

The Effect of an Interprofessional Educational Simulation Exercise on Perceptions

Kennedy Morrison

The Intergroup Contact Theory, first described by Allport (1954), suggests that when members of different groups collaborate, they reduce prejudice & stereotyping. When groups participate in collaborative exercises, interprofessional education & team unity are enhanced (Pettigrew & Tropp, 2006). However, the impact that collaborative exercises have on intrapersonal perceptions of professional attitudes & skills in different ethnic groups & genders has not been widely studied.

The data was gathered by faculty at a major southwestern U.S. university during Trauma Day, a multi-university exercise designed to develop interprofessional collaboration skills between nursing, social work, first responder, & pharmacy students. After receiving IRB human subject approval, 88 students participated in a one day emergency room simulation with separate morning & afternoon groups. After consent was given, students provided demographic information & completed the Readiness for Interpersonal Learning Scale; Learner Simulation Based Self-Confidence Scale; & the Learner Satisfaction Scale (post only).

Prior to the simulation, females had significantly ($p<0.01$) higher negative professional perceptions compared to males; Caucasians had significantly ($p<0.01$) more skills than their non-Caucasian colleagues; &, nurses believed they had significantly ($p<0.01$) more knowledge than their peers. After the exercises there were no significant differences on any of these measurements. Overall, pre & post comparisons found there was significantly improved ($p<0.01$) team collaboration; significantly reduced negative professional attitudes; &, significantly ($p<0.01$) improved positive professional attitudes. The students reported significantly improved skills & knowledge ($p<0.01$).

The initial analysis appears to suggest that simulation exercises do more than reduce interprofessional stereotypes & barriers to collaboration. They may assist in reducing the potentially more difficult intrapersonal professional perceptions & attitudes for those who identify as female & non-Caucasian. This leveling effect could mean that interprofessional simulations have a significant positive effect on the acculturation & assimilation of women & people of color into healthcare settings.

Long Term Affects of Speech Therapy on Aphasia

Regine Yaites

This study investigates long-term effects of aphasia treatment in participants previously treated with CIATplus therapy. A single-subject design was utilized to reassess a participant's verbal naming abilities. It appears CIAT therapy provided a springboard effect for continued improvement in verbal naming for this participant.

In a previous study, Askins et al. (2013), the effects of CIAT therapy using therapy targets individualized to a participant's everyday language was reported. The participant was a 44 year old female and 7 months post hemorrhagic stroke. Constraint Induced Aphasia Treatment was implemented through colored picture cards as a therapy tool in identifying items that the

participant would encounter on a daily basis. The participant would use activities that expound on the use of context clues to properly identify the object. Therapy was administered to the participant for a total 30 hours; 3hrs/day over a two week period. As a result of the therapy, the participant demonstrated a 7% increase in independent verbal response. At the end of the study, the researchers recommended future research which includes an additional number of participants and re-evaluation at the three month period.

The purpose of the current study was to investigate long-term effects of Constraint Induced Aphasia Treatment (CIAT) in participants previously treated with CIATplus therapy.

No Change in Perceptual or Chronotropic Outcome When Altering Preferred Step Frequency for a Short Duration

Megan Kriger, Jill Baker, Gloria Haynes, Marlee Jones, Heather Markgraf, Janice Nkrumah, & Brianna Phillips

Introduction: Millions of individuals incorporate jogging into their routine. People appear to choose jogging speed and the associated step frequency by preference. The purpose of this work was to investigate if preferred step frequency (preferred jogging pace) minimizes perceived effort (Borg Rating of Perceived Exertion, 6-20; RPE) and chronotropic stress (heart rate; HR) during a ten-minute activity bout when compared with altering step frequency by 5%. **Methods:** Recreationally-trained males underwent two visits. The first visit established RPE and HR responses at preferred speed and step frequency. On a subsequent visit, two-four days later, with preferred speed maintained, subjects were guided by metronome to strike at 95% or 105% of their preferred step frequency. The runs were randomized, crossed-over, and separated by 20 minutes. RPE and HR were analyzed by repeated measures ANOVA. **Results:** Fourteen subjects (age: 21.1 ± 0.95) enrolled. Preferred jogging speed (speed: 6.4 ± 1.0 miles per hour) and step frequency (steps: 161.2 ± 10.3 steps/minute) were determined at the first visit, along with RPE (11.3 ± 1.7) and HR (166.4 ± 12.7). At the second visit, preferred speed was maintained while the foot-strike frequency was altered. Neither differences in RPE ($p = 0.252$; 11.3 ± 1.7 , 11.6 ± 1.9 , 11.8 ± 1.5) nor HR ($p = 0.547$; 166.4 ± 12.7 , 164.7 ± 14.9 , 165.2 ± 15.3) were different when comparing the preferred, 95%, and 105% step frequency trials, respectively. Some subjects verbalized displeasure with the change in pace and most appeared to alter the initial foot strike phase of the gait to meet the foot strike tempo. **Discussion:** While altering step frequency by 5% for a short duration does not appear to alter an individual's RPE or HR, the result during longer duration activity may not be the same. Biomechanical loading and metabolic cost were not investigated.

Antibiotic Resistance and Biosynthetic Potential of Microbes Isolated from Sorcerer's Cave, Texas

Jeffrey Wooliscroft

Unexplored cave environments provide a valuable opportunity for novel microorganisms and compounds. In total, fourteen culturable microbial organisms were isolated from Sorcerer's Cave, Texas. Antibiotic resistances were studied, showing moderate to high levels of resistance in all organisms. Composition of studied organisms was largely dominated by the genus *Pseudomonas* (~79%). Our results addressing antibiotic resistances were not bizarre in regards to pseudomonad multiple antibiotic resistance properties. However, this study provides an early first view of this unique cave environment and will pursue the biochemical opportunities these organisms may hold in the future.

Quantifying Wolbachia and Spiroplasma Infection Rates in Monarch and Queen Butterflies

Kristen Brehm, Isabel Laiseca-Ruiz, & 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 falls of 2014 and 2015, 203 butterfly specimens were collected from around the campus of Abilene Christian University in Abilene, TX. 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. PCR products were checked using gel electrophoresis with a size standard to ensure that amplified products matched the expected size, and representative samples were verified with DNA sequencing. Thus far, DNA has been extracted from 129 butterflies, and Wolbachia-specific primers have amplified Wolbachia from two monarchs and one queen. This is a low occurrence of Wolbachia, but matches what has been reported in other studies. We have yet to definitively identify Spiroplasma in our samples, but we suspect this is a primer specificity problem.

Comparison of Symptom Interference of Quality of Life in Post-Radiation Treatment Early Stage vs. Late Stage Laryngeal Cancer Patients

Luke Cooksey & Katie Preston

Quality of life studies are the benchmark for how we expect patients to live after they receive treatment. Analyzing trends in symptoms, particularly after radiation treatment, helps to determine how treatment implementation should be improved and altered to limit any long-term symptoms or discomforts. Our lab is attempting to analyze the quality of life after receiving radiation treatment at one institution for laryngeal cancer by going through a series of questionnaires with laryngeal cancer patients that will improve treatment delivery and decrease the likelihood of the treatment causing severe long-term symptoms. Our hypothesis is as follows: "The symptoms interfering with quality of life for post-radiation treatment late stage laryngeal cancer patients is significantly higher than that of post-radiation treatment early stage laryngeal cancer patients." Symptom inventory questionnaires were collected from 230 laryngeal cancer patients 22-24 months post treatment. Each patient was asked to rate the severity of their symptoms on a scale from 0 ("none") to 10 ("worst possible"). Upon completion, the responses were compiled and analyzed using Microsoft Excel. Based on the data, there is a slight difference in symptoms interfering with quality of life among early stage versus late stage post-treatment cancer patients 22-24 months after treatment. Late stage patients did show an increase in symptom interference with quality of life. However, the increase was not as significant as hypothesized. Analysis showed dry mouth to be the most common symptom that interfered in both early stage and late stage patients, while vomiting was the least common. The overall quality of life for early stage and late stage laryngeal cancer patients was significantly high with a relatively low measure of symptom severity. As the issue of dry mouth, in particular, persists in a large number of these patients, there is a continuous need of refinement in this area.

Phylogeny of rodent genus Thomasomys based on the mitochondrial cytochrome c oxidase subunit I gene

Jeremy Aymard, Cody Bly, Andrea Saenz, & Samantha Studwick

Thomasomys is a large rodent genus distributed primarily in montane habitats in South and Central America. Previous taxonomic efforts in classifying species within Thomasomys have utilized mitochondrial cytochrome b (Cytb) gene sequences to reconstruct a species-level phylogeny. However, many branches of the tree needed for reconstructing the geographic and ecological history of Thomasomys were short with low bootstrap support, suggesting rapid speciation events. This study adds phylogenetically informative DNA sequences from the cytochrome c oxidase 1 (CO1) gene in order to better elucidate evolutionary history and incorporates recently sampled taxa, including new samples from the species *T. baeops*, *T. cinnameus*, *T. ucucha*, and *T. vulcani* collected in the summer of 2014 from the Carchi Province, Ecuador. We performed PCRs to amplify CO1 using the previously published primers BatL5310 and R6036R. PCR products were direct sequenced and then edited and aligned using Sequencher 5.4 and SE-AL v2.0. Maximum likelihood (ML) searches were performed using RAxML to determine the best tree and bootstrap support for clades. Phylogenetic results were congruent with analyses from Cytb and provided support and increased resolution for our previous hypotheses.

Future Habitat Niches of Thomasomys and Rhipidomys (Rodentia: Cricetidae)

Paris Webb & Amy Grotjohn

Thomasomys and Rhipidomys are closely related genera of mouse-like rodents native to South America. Thomasomys is distributed mainly along the Andes mountains at elevations from about 1,200 meters to above 4,500 meters. Rhipidomys is found in forested habitats throughout most of tropical South America, ranging from lowland rainforests to forest-paramo ecotones at over 3,000 meters. We used the Global Biodiversity Information Facility (GBIF) database to find precise latitude and longitude coordinates of 108 unique localities of Thomasomys and 85 for Rhipidomys. We gathered global climate data from the WorldClim database for current and future conditions projected for the year 2080. The program Maxent was used to predict current and future climate niches from locality and climate data. Niche reconstructions showed that the current niche of Thomasomys is primarily limited to the highlands of the Andes at higher elevations and colder temperatures than most species of Rhipidomys. The future niche of Rhipidomys is predicted to shift further towards areas of high elevation, which in turn will greatly decrease the range of this genus. Because both Thomasomys and Rhipidomys have been found to prefer Andean ranges in the future, global warming is expected to result in increased overlap in their habitat niches and greater competition.

Baseline survey of small mammals and bacterial pathogens in the southeastern Rolling Plains

Hannah Seah & Daisy Gomez

The southeastern boundary of the Rolling Plains lies near the geographic center of Texas at the confluence of three ecoregions: Rolling Plains, Cross Timbers, and Edwards Plateau. Elements of these ecoregions, including edaphic conditions and vegetation intergrade in our survey site southeast of the Callahan Divide in Callahan County. Biodiversity knowledge in this region is sparse due to large amounts of private land ownership. Through recent acquisition of a conservation easement by the Texas Land Conservancy, we have been given the opportunity to document biodiversity, including small mammal species, to serve as baseline data from which change related to land use and climate can be monitored. Our primary objective is to document the diversity of species of small mammals (primarily rodents) in the southeastern Rolling Plains across various habitat types. Because rodents are reservoirs for a variety of tick- and flea-borne bacterial pathogens, we also aim to document bacterial pathogens that are associated with rodents in the southeastern Rolling Plains. We collected tissue samples from rodents using Sherman live traps during late spring and early fall of 2015. We are using PCR and DNA sequencing to identify

captured rodents and any detectable bacterial pathogens in the genera *Borrelia* (causative agent for Lyme disease and other diseases), *Rickettsia* (causative agents for spotted fevers and typhus), and *Yersinia* (causative agent for plague). Due to the ecotone nature of our survey site, the inventory of pathogens in this region could contribute to greater understanding of disease transmission and migration in central Texas.

*Estimating Climate-Based Range Expansion in *Prosopis glandulosa* (Honey Mesquite)*

William M. Keenan

With the current struggles land managers face to control incursion by *Prosopis glandulosa*, it is important to understand where this species has lived (paleoniche), where it currently lives, and where it has the potential to live in the future. The purpose of this study was to evaluate the paleoniche and current potential distribution of *Prosopis glandulosa* in order to identify areas that will become vulnerable to invasive spread as climate warming trends continue. Current species distribution data was consolidated from several databases, including the Global Biodiversity Information Facility and USDA databases. This data was then compared with historical and future climate estimates and current climate conditions from the WorldClim database. Using species habitat modeling (Maxent) and GIS (Diva and ArcGIS) software we were able to estimate current and past niches. Comparison of these niches to historical distribution data suggested a correlation between warming trends and expansion of the possible *Prosopis glandulosa* range. Reconstructions suggest that *Prosopis glandulosa* had a paleoniche range south of the Rio Grande River during the last glacial maximum and moved north during the current interglacial period. This range has noticeably continued north since Little's 1970 documented range, suggesting that warming can partly explain even recent expansions. The future model predicts expansion of niche into major agricultural crop areas of the Pacific Northwest and the Midwest as well as Western livestock ranges. The most important take away is that all current and future niche areas predicted by these models that do not already have *Prosopis glandulosa* are or will be vulnerable to its invasion, thus land managers should begin practicing preventative management techniques.

Infectious Disease Prevalence and Age of Feral Cat In a Population Living on the Abilene Christian University Campus

Amanda McCormick

Feral cats tend to aggregate in locations where there are plenty of living areas and food sources, such as university campuses. Feral cat populations are often considered to be a nuisance or a health concern. The Agricultural and Environmental Sciences Department at Abilene Christian University, in conjunction with the ACU Grounds Crew, implemented a Trap-Neuter-Return (TNR) program in 2013. In 2014, the TNR program was expanded to include health testing. All of the cats in the program were estimated to be less than 5 years old, with the majority being 2 years of age or younger. This finding raises the question of the welfare and lifespan of cats living in feral cat colonies at ACU. We found that there is a very low prevalence of infectious respiratory diseases observed at the time of examination, and conclude that the relatively short lifespans are not due to these infectious conditions. Though the causes of feral cats' short lifespans are not fully known, we conclude that most deaths on campus are not due to FeLV/FIV due to the low prevalence of those infectious diseases among the feral cat population at Abilene Christian University.

Comparison of Microbial Communities Growing in Winogradsky and Diatomaceous Earth Columns

Taylor Russell

What is not known about Winogradsky columns constructed from a diatomaceous earth substratum inoculated with sediment microbes (DE columns) is how well the microbial growth and chemistry taking place in them matches up with that seen in traditional Winogradsky columns made with sediment from the same natural resources. The central concept of this research was to determine whether changing the substratum of a column also results in altering the types of microbes that thrive in the column ecosystem. Water and sediment samples from Lake Buchanan were used to construct sediment and DE columns. The columns were incubated and allowed to develop for three months. Environmental metagenomics were used to take a snapshot of the microbial diversity in the ecosystems that developed within the columns. By utilizing metagenomics, the DNA of all the genomes of organisms in the community could be analyzed collectively. These methods revealed a new understanding of the diversity of the species found in these different formulations, and in the impact their composition has on the ecological events taking place in these columns.

Protein and Fiber Differences in First and Second Cutting Sorghum Hay Harvested in West Central Texas

Ryan Pleasant

When using sorghum hay to feed cattle during the winter, it is important to know the fiber and protein content so the proper amount hay can be fed. If the percent fiber and protein are low, a supplemental feed must be used in order to maintain herd health. Many farmers believe first and second cutting sorghum hay is identical; however, there could be significant differences..

This study is being conducted to determine if there are differences between first and second cutting sorghum hay harvested in west central Texas. The first cuttings were harvested after a wet spring in late June to early July. The second cuttings were harvested in mid-November after a dry late summer and fall. First cuttings had optimal growing conditions in late spring to early summer, which is characteristic of west central Texas in those months when rainfall is abundant. The second cutting hay was under stress in the late summer heat with little rainfall occurring, also characteristic of west central Texas those months. Yields for the first cuttings averaged 5.28 bales per acre with the bales weighing 1100 lbs. Yields for the second cutting averaged 1.04 bales per acre with the bales weighing 1100 lbs. Five samples were taken from five different bales in each of the five fields for both cuttings. A sample consists of stalks and leaves from five different areas inside the bale. Protein and fiber analyses were conducted on each sample. The results are analyzed statistically to determine if there are any significant differences between the two cuttings. This will provide useful information to ranchers that can be used to provide proper nutrition for their cattle.

Development of a new nuclear marker for phylogeny reconstruction in Thomasomys (Rodentia: Cricetidae)

Paulina Sanchez, Maya Feller, Katherine Lawrence, & Jessica James

Thomasomys is a genus of mouse-like rodent species distributed primarily in northwestern South America. Previous investigations based on mitochondrial genes have provided well resolved nodes at the species level. In contrast, most deep nodes needed for reconstructing evolutionary adaptations in the geographic and ecological history of Thomasomys had short branches and low bootstrap values, suggesting a rapid radiation early in the diversification of Thomasomys. In order to further test these phylogenetic hypotheses, we have designed new primers and obtained sequences from intron 2 of the nuclear acid phosphatase type V (AP5) gene. Early results suggest that this marker is less variable than previously used mitochondrial markers but could contain significant amounts of phylogenetically informative characters. Although increased phylogenetic resolution has been minimal, this nuclear gene can provide independent evidence supporting mitochondrially based hypotheses.

Retrofitting a Manually-Operated Scanning Monochromator with a Computer-Controllable Stepper Motor

Candace Brooks

During summer 2015, I worked on automating a 1960s-era monochromator. The original hand crank used to tune the wavelength of the monochromator was replaced with a stepper motor, which is controlled using an Arduino Uno microcontroller board. I wrote software using the Arduino and Python languages which allows the user to type in a wavelength, or range of wavelengths, for the monochromator to go to or scan through automatically. The software allows for a linear offset to be applied to the wavelength reading in case the analog wavelength display of the monochromator does not match the apparent wavelength from calibration spectra. I will present the current state of this project, initial calibration data, and future steps necessary to realize the usefulness of this piece of equipment in modern experiments.

Biometrics and Psychometrics in Yahoo! Data

Christy Duke

This study will focus on better understanding psychometric and biometric factors that influence outcomes from the fulfillment process (selling of product) using data collected from ERP (Enterprise Resource Planning) systems and social media data soon to be made available by Yahoo. With the increased availability of data collected from sources such as social media and electronic health information, opportunities exist to identify and compare underlying patterns of psychological behavior through psychometrics with the associated physical characteristics of individuals through biometric analysis (i.e., in fingerprint or voice patterns) as a means of verifying personal identity. The discoveries from this research can improve the fulfillment and customer relationship management processes in SAP ERP system and for company research and development.

Tuesday, April 5, 12:45 – 1:20 PM

Poster Session II: Hunter Welcome Center Atrium

Gender and Double Standards in Easy A

Kimberly Martinez

The purpose of this essay is to analyze how screenwriter Bert V. Royal's hit film Easy A illustrates how gendered double standards are problematic. The essay begins with an overview of the film, and then segues to a rhetorical analysis. In the rhetorical analysis, the essay outlines the rhetor, audience, reception, and context. Next, is the methodology of the film, where the deeper meaning and the "So what?" of the film is presented. A detailed analysis follows, and is divided by the two themes: the sex double standard between women and men, and gender roles. The sex double standard between women and men is explored via the rhetorical tools: arguments and visuals, denotation and connotation, and implying causation. The gender roles portion is examined via the rhetorical tools: arguments and visuals, characterizations, and character development. The essay

ends with a conclusion about how the themes and tools used support Royal's argument that gendered double standards are problematic.

Who's He Tweeting?: Attachment and Jealousy on Social Media

Kylie Richter, Brandon Clements, Alexandra Gartley, & Brie Hawkins

Social media is often used for the purposes of relationship enhancement and maintenance for those in romantic relationships. And yet, 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, however, there has been little empirical work on the phenomenon of social media-related jealousy and its relationship to established measures of romantic trust, jealousy, and adulthood attachment styles.

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

Julia Prior & Katie Bell

According to the Child Life Council's vision statement (2015), "The services provided by the child life profession will be holistic and will utilize applied child development and family systems theory. The objectives of such services will be to minimize the negative impact of situational disruptions while maintaining individual growth and development and family relationships". Little research has been conducted in the field of child life, specifically regarding child life's effect on the family system as a whole. This qualitative study intends 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. Using phenomenological research, this study is 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? As a result of the information gathered thus far, it has been proven that child life services have helped families become more resilient to the stressors encountered by reducing outside stressors as possible. As this research continues, it will aim to pinpoint the various interventions that specifically aim to reduce familial stress and therefore explore how these interventions aid in family stress resilience. This study contributes to previous research about family-centered care which drives the child life practice and prove that child life services are highly regarded by families with hospitalized children, consequently providing evidence to advocate for support and funding of child life services.

Public Perception of SNAP Benefits: Implications for Policy and Practice

Chelsea Fordham

This study examines public attitudes and beliefs associated with the SNAP benefit program, specifically regarding proposed changes and policy. Recent media attention and research has shown that many influential leaders and citizens have taken the challenge to live on a SNAP benefit budget of \$29 a week, the standard weekly amount given to one person in the program. Those brave enough to take this challenge have all reported that it is nearly impossible to purchase enough food on this budget, let alone healthy and nutritious options. Aside from the few people who have participated in this challenge, there is very little research done regarding SNAP benefits or the people who participate in the program.

SNAP benefits change in accordance to the United States Farm Bill update every five years. With the last Farm Bill passed in 2014, the government has already begun assessing the effectiveness of this program and the usefulness to the beneficiaries. This study addresses the public's view of the program and the people on the program. This is due to the advance and popularity of the 'food movement' and recent research in health and nutrition (i.e. relationship of dietary and saturated fat to heart disease) throughout the past 5 years, possibly changes in SNAP benefits and overall policies relating to people in poverty could be needed to address the growing health and obesity epidemic, primarily among marginalized populations.

This exploratory study utilizes an electronic survey to gather data from all participants (n=184). Participants were gathered with a convenience/snowball sample using email distribution lists and social media. Data was analyzed by appropriate statistical tests, including T-test, Chi-squared, and correlation.

Initial results suggest correlations between political affiliation, socioeconomic status, race, and religious affiliation and attitudes about SNAP benefits exist. There are also correlations between various demographic factors and misconceptions about the current state of SNAP as well as proposed changes to the program.

This study provides a foundation for future policy proposals and changes to increase public acceptance of this program at large. It fills the current gap in the literature regarding perceptions of SNAP benefits in order to analyze how those who have not been in the program compare to those who have been enrolled in SNAP. The study also focuses on program's perceived effectiveness in assisting people suffering from hunger and food insecurity.

This study provides groundwork for future implications regarding social work practice and policies. This information will act as a support for government officials to utilize when issuing the next U.S. Farm Bill. This research culminates new research projects to further develop literature in this field. Further research could include studies evaluating the effectiveness of SNAP benefits, studies describing the challenges associated with program participation, as well as the level of nutrition participants have while on this program. Further studies can allow for evidence based practice for social work practitioners, as well as overall more effective and beneficial policy changes resulting in positive macro effects.

Engagement and Productivity in Gendered and Non-Gendered Toys in Girls Ages 8-11

Claire Tyrrell & Bree Foster

This mixed methods study examined the relationships between gendered and non-gendered building and non-building toys with engaged and productive play in eight to eleven-year-old girls. Videos of the girls playing with four different toys were analyzed and coded for engaged and productive behaviors, including completing toy assembly, engagement and disengagement, and creative play. Qualitative analyses were conducted to examine the patterns of play and productivity. A comparison of the patterns across the four toys indicated differences between the toy types as related to completion, engagement, and play. Quantitative analyses were also performed using SPSS software to determine the degree of significance of the patterns of toy play.

Typecasting of Women in the Action Film Genre

Erika Thrasher & Emily Studer

This research is to show that misrepresentation of female characters in film have been a subject of concern for years, and the most dramatized depictions of women are frequently observed in the action film genre. The sample was taken from the top 3 highest grossing action films from 2009-2014 making for a total of 18 films. These films were coded based on the ratios of male to female characters and the 10 basic archetypes women are most frequently viewed as. Some of the major findings in this study revealed that 60% percent of female characters appeared in an intimate, romantic scene with a partner and nearly 13% appeared mostly exposed while on screen. Out of 70 female characters in 18 movies, 5.7% were lead roles and women appeared as the object of a man's sexual desire (lover or seductress) in 20% of characters. In some cases, a character could fit into more than one archetype. For the purpose of this study, the archetype that most fit the character for the majority of the film was chosen. Overall, the content analysis in this study regarding the portrayal of women in action films found that women are still underrepresented and typecast into similar roles leading them to be seen as weaker, over-sexualized and helpful to the development of a subplot instead of a main focus.

The Role of Histone Deacetylase 3 in Diffuse Large B Cell Lymphoma

Tina Johnson

Diffuse Large B Cell Lymphoma (DLBCL) is the most prevalent form of Non Hodgkin's Lymphoma, comprising forty percent of diagnoses. Within this cancer, there are two molecular classes: germinal center B-cell-like (GCB) and activated B cell like (ABC) DLBCL. While patients with the GCB form respond well to traditional treatments, those with the ABC form encounter resistance to treatment. Thus, there is great need to investigate the molecular differences between these subtypes and apply this knowledge to treatment. Recent investigations demonstrated epigenetic aspects of the disease—specifically involving histone deacetylases (HDAC). While there are four different classes of HDACs, focus has recently shifted to class I. This study, then, sought to better characterize the role of class I HDAC, specifically HDAC3, in DLBCL.

Previous studies have demonstrated that ABC DLBCLs express HDAC3 at a higher level than GCB DLBCLs. Thus, we chose to inhibit HDAC3 with the pharmacological inhibitor RG2833 and investigate differences proliferation and survival. Following HDAC3 inhibition, we observed decreased proliferation in both GCB and ABC DLBCLs. Similarly, HDAC3 inhibition decreased cell survival in both GCB and ABC cell types. We then investigated differences in histone acetylation with the molecular markers ACH3K9, ACH3K27, and ACH4K5. We demonstrated that treatment with RG2833 increases acetylation in both GCB and ABC samples at early and late time points. To investigate HDAC inhibitors and HDAC3 overexpression, we transiently transfected HEK-293 cells to overexpress HDAC3, and we treated our cells with a series of inhibitors: SAHA, Belinostat, Romidepsin, and RG2833. Following 72-hour treatment, we assessed cell proliferation. We observed HDAC3 overexpression reverts the effects of SAHA and RG2833, but provided no proliferative advantage for Belinostat or Romidepsin exposure. Thus, SAHA and RG2833 likely act through inhibition of other HDACs.

The Role of Chronology in Analyzing Introductory Programming Assignments

Kayla Holcomb

Entry-level programming courses have been shown to have high failure rates across college campuses, which lead to high dropout rates for associated majors. These courses typically cover foundational programming concepts which students must master in order to succeed in their major.

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. Automated Assessment Tools (AATs) help accomplish this task. However, even the most advanced AATs are limited when it comes to recording student progress, 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 can provide educators a more complete understanding of the student's thought process.

We created a simple version of an AAT that tracks, in detail, line-by-line, the steps taken to solve a predetermined programming assignment and the sequence of those steps. We are essentially placing the professor over the shoulder of each student to watch and analyze the programming process, rather than only looking at submission or compilation attempts, which is commonly an AAT's design. Student submissions are categorized by the order of steps completed, which allows educators to identify commonalities in successful strategies for problem-solving within a course. These commonalities include organizing the code structure first, following the flow of the program when defining functions, and completing key processes in a logical order. Assessing the chronology of a submission in relation to the successful strategies for an assignment can help identify whether a student stumbled upon a correct solution or formed a reasonable approach. With this tool, we anticipate that teaching methodologies can be modified to more effectively foster generally successful problem-solving strategies within early programming courses.

Residual ATNR May Affect Functional Movements in Children in an Additive or Synergistic Manner

Jaci Williams, Emily Sorrells, Elena Taylor, Megan Hobby, Bailee Burns, & Chelsie Stefan

Background: The asymmetrical tonic neck reflex (ATNR) is a primitive reflex that develops in utero, is displayed in the early months of life, and is integrated by around 6 months when postural reflexes in the maturing baby take superiority. Postural reflexes support balance control and movement. If primitive reflexes remain, voluntary and complex movements can be influenced. **Purpose:** This study was purposed to describe and broaden awareness of the occurrence and functional impact of residual ATNR in children. **Methods:** Five functional assessments involving bilateral coordination [ball toss, ball catch, jumping jacks, and both contralateral and ipsilateral alternating limb movements (ALM)] were included. Each task was scored as the number completed out of 10 attempts. ATNR was assessed by goniometry. For analysis, the five children without ATNR served as a control group. The severity of ATNR in the right (mean $43.7^\circ \pm 27.3^\circ$) and left (mean $47.4^\circ \pm 21.7^\circ$) arms was divided into quartiles and scored by arm. A combined score was then used to determine a total severity score, which placed children into upper and lower halves. **Results:** Thirty-two children (Male/Female = 25/7; age = 7.7 ± 2.0) enrolled. Twenty-seven children displayed uni- or bilateral residual ATNR. Children in the control group outperformed children with ATNR in the ball toss (mean = 9.7/10 vs. *5.7 and *6.5), jumping jacks (mean = 6.5/10 vs. *2.5 and 4.3), contralateral ALM (mean = 6.7/10 vs. *1.8 and *2.3), ipsilateral ALM (mean = 7.0/10 vs. *3.0 and 4.5), and total bilateral score (mean = 35.8/50 vs. *17.1 and *21.8), respectively. **Discussion:** Considering that children in the control group suffer from similar developmental difficulties, the resulting differences are both notable and intriguing. Collection of data during practice is needed for validating and extending the findings in our work as well as increasing evidence-based practice.

Bobwhite Quail and Montezuma Quail Territory Change

Christian Hofsommer

The bobwhite quail is a small ground dwelling bird with a distinctive whistling call from which the name “bobwhite” is derived. Bobwhites are widespread and the only quail native to eastern North America, but their populations have declined substantially during recent decades, probably because of habitat loss and changes in agriculture. The more colorfully marked Montezuma quail is a similarly-sized ground bird more narrowly distributed in the Mexican high country and southwestern United States. Montezuma quail have disappeared or become scarce in parts of the southwest because of overgrazing. In this study we predict current and future habitat niches using quail locality data collected from Global Biodiversity Information Facility and current and future climate data from the WorldClim database. Niche predictions generated in the program Maxent were mapped using the GIS program DIVA in order to compare current and future ranges of the two quail species and to predict potential future interactions of the two species. Reconstructions suggest that the bobwhite’s territory could expand into central North America due to global warming while simultaneously vacating some southern states. The Montezuma quail’s niche is predicted to shift north and be more narrowly concentrated in mountainous areas. The narrow future distribution of the Montezuma quail also exhibits increased overlap with the bobwhite niche, suggesting that these species could experience greater competition.

Phylogeny of rodent genus Thomasomys based on the mitochondrial cytochrome b gene

John Iragena, Kathryn Mitchell, Jacob Nelson, & Mark Wenzel

Thomasomys is a genus of 30 – 40 rodent species distributed primarily in northwestern South America. Previous taxonomic efforts in classifying species within Thomasomys have utilized mitochondrial DNA sequences to reconstruct a species-level phylogeny. This study incorporates recently sampled taxa into the ongoing assessment of phylogenetic relationships and previous taxon descriptions. New samples from the species T. baeops, T. cinnameus, T. ucucha, and T. vulcani were collected in the summer of 2014 from the Carchi Province, Ecuador. Phylogenetic analyses were based on sequences obtained from the cytochrome b (Cytb) gene . We extracted DNA from liver tissue and performed PCR using the previously the published primers p484 and p485. PCR products were direct sequenced and then edited and aligned using Sequencher 5.2.4 and SE-AL v2.0. Maximum likelihood (ML) searches were performed using RAxML to determine the best tree and bootstrap support for clades. Phylogenetic results suggest that 1) recent collections from Ecuador represent new distribution records for T. tacjanowskii, 2) new DNA sequences suggest that T. ucucha is closely related to T. silvestris and that T. vulcani is closely

related to *T. fumeus*, and 3) more thorough sampling of *T. cinnameus* suggests that specimens may represent two sister species.

Anaerobic Sequencing Batch Reactor

William Head

The purpose of this work is to develop and construct a laboratory scale anaerobic sequencing batch reactor (ASBR) that provides operational flexibility to model real world engineering design requirements. The anaerobic sequencing batch reactor is a unique reactor design that provides for the anaerobic treatment of dilute organic waste streams. Part of the operational flexibility of the ASBR is its ability to operate using dilute feedstocks and increased capacity to utilize liquid secondary feedstocks for increased biogas production. The parameter that is considered to be central to the performance and stability of the ASBR is settling and solids retention. The ASBR operates by cycling through a sequence of four phases in a single reaction vessel; fill, react, settle, and decant. By including the settling phase within the reaction vessel, the ASBR has the ability to separate the hydraulic retention time (HRT) from the solids retention time (SRT) without the use of traditional external clarification and sludge handling systems. This allows for the ASBR to treat wastes at an equivalent level of a traditional digestion system while operating under shorter hydraulic retention times. Developing a laboratory scale design that can be applied directly to full scale is necessary to extend the use and construction of full scale ASBR's beyond a single site. Currently, there is only one functional and operational full-scale reactor located at the Swine Research and Education Center at Oklahoma State University. The work resulting from the development, construction, and operational of a new lab-scale model at Abilene Christian University will provide practical engineering knowledge for direct implementation of this technology.

Osmium Carbonyl Clusters with Iodine Atoms

James Johnstone

Many chemicals containing metal-metal bonds (metal clusters) are good catalysts for making changes to organic materials. Several metal clusters that contain both iodine atoms and osmium atoms have been made in small quantities. However, due to low yields for the production of these clusters, very little is known about the way that they react or their potential to serve as catalysts. We have used a microwave reactor to carry out reactions between iodine and Os₃(CO)₁₂, and we have been able to prepare two known cluster complexes: trinuclear Os₃I₂(CO)₁₀ and dinuclear Os₂I₂(CO)₆. These complexes were previously synthesized in low yield by conventional heating over long periods of time. The use of microwave heating produces these complexes much more efficiently, thus allowing for studies of their reactivities. Both of these complexes were reacted for the first time with bis(diphenylphosphino)methane (also known as dppm) and 1,3,5-triaza-7-phosphaadamantane (also known as PTA), both of which replace CO groups. We will describe the products of these reactions.

The Roundabout Way to Deal with Traffic

Audrey Kinzinger & Faith Moore

When driving around Abilene, one may notice that traffic can get congested, especially in certain areas. This is particularly true at the intersection of Judge Ely Boulevard and East North 16th street. After observing the intersection, it became apparent that there were two main problems. The first was those turning left onto Judge Ely had a very small turn lane, which caused traffic to build up extensively behind them. They also lacked a green arrow alerting drivers it was safe to turn, which caused confusion and a longer delay. The other issue was with cars attempting to turn right onto E. N. 16th street. Due to a lack of a right-hand turn lane, there was build up occurring behind the cars waiting to turn. When addressing the problem, a "Design Thinking" approach was used. After observing the intersection, the researchers identified the problem and created a goal statement that would guide the design throughout the process. Solutions for this problem were brainstormed in a group setting, with no idea being too outrageous or denied. After coming up with as many solutions as possible, the ideas were grouped for similarity, then evaluated for achievability. From there, the group decided that implementing a two-lane roundabout would be the most ideal solution for optimizing the flow of traffic through the intersection. Research conducted found that a roundabout would decrease accidents while maximizing traffic flow. It was also more cost effective than any other option. Although the concept of roundabouts are a novel idea to the area, drivers could quickly adapt if this solution was adopted in this intersection and others in Abilene, and the benefits would be advantageous for the entire city.

*Variation in the cytochrome c oxidase subunit I gene among populations of *Tadarida brasiliensis**

Kimberly Burt, Alyssa Wilder, Charity Weaver, & Michael Ramirez

Previous studies have examined the difference between populations of *Tadarida brasiliensis* in North and South America using sequences from the mitochondrial cytochrome B gene (cytB) and the ribosomal gene 16S. However, those results suggested that cytB sequences were too variable between the populations for comparison across different continents and that the ribosomal gene 16S was not variable enough to compare populations. In this study we examine the cytochrome c oxidase subunit I (CO1) gene. The CO1 gene has less variation in it than cytB, but it has more variation than 16S. We picked this gene because we wanted to be able to compare all populations in a single haplotype network. Research on the GenBank sequence database suggested that other researchers have had success with this gene for *T. brasiliensis*. Here we compare sequences of

the CO1 gene collected from GenBank to specimens recently collected in Ecuador and West Texas in order to better understand relationships and migration patterns of these populations.

Phylogeny of rodent genus Thomasomys (Rodentia: Cricetidae) based on the nuclear gene recombination activating gene 1

Amberly Grothe, Cheyenne Cagle, & Marissa C. Home

Thomasomys is a South American rodent genus occurring in high-elevation habitats. Previous phylogenetic hypotheses describing speciation within Thomasomys have been based on morphology or mitochondrial gene sequences. However, additional evidence is necessary in order to resolve the order of several rapid speciation events early in the diversification of Thomasomys. This study adds phylogenetically informative DNA sequences from the recombination activating gene 1 (RAG1) in order to strengthen support for previously generated hypotheses. We performed PCRs to amplify RAG1 using the recently developed primers TDF2 and TDR2. PCR products were direct sequenced and then edited and aligned using Sequencher 5.4 and SE-AL v2.0. Maximum likelihood (ML) searches were performed using RAxML to determine the best tree and bootstrap support for clades. Although RAG1 has proven to be less informative than previously sampled mitochondrial genes, phylogenetic results were congruent with analyses from mitochondrial genes and provided support and increased resolution for our previous hypotheses.

Analyzing the use of Financial Derivatives to Manage Price Risk for Cattle Feeding Operations

Kevin Coburn & Brody Benge

Agricultural businesses face a unique set of risks, including an increasing amount of market price fluctuations. Agricultural producers use financial derivatives to manage their commodity price risks and the volatility of the commodity markets. Cattle feedlots deal with a variety of exposure to fluctuations in the cost of feed, the cost of feeder cattle and the selling price for finished cattle. The cattle crush spread is a ratio of buying one feeder cattle and one corn contract versus selling two live cattle contracts or its inverse. To calculate the value of the spread, gross feeding margin (GFM), add the price of the feeder cattle and corn contracts then subtract the price of two live cattle contracts. The GFM historically varies between ten percent above and ten percent below cost, making the spread a viable way to hedge. The model chosen is a Monte Carlo pricing engine stress test. Others have chosen similar methods to evaluate the efficiency of the hedge. This study tested the sensitivity to fundamental economic factors on the spread itself. The model uses multivariate geometric Brownian motion and exponential theoretical random numbers to quantify risk probability and stressors. Results indicate certain fundamental economic factors have greater stressor values than others allowing better business decision making throughout the cattle feeding cycle. The model can be used to assess risk and probability for market entry and exit levels. The model could also be employed to assess other trading strategies used to manage an investment portfolio and to anticipate the impact of future market stressors.

*The Effect of Environmental Stress on Canine (*Canis familiaris*) Glucocorticoid Levels in Boarding Kennels Versus Domicile Conditions*

Anna Curby

When dog owners go out of town for a period of time, a large majority of them turn to boarding facilities to take care of their animals in their absence. These boarding facilities ensure the basic care of the animal through daily feedings, replenishing of water, and depending on the facility, a certain amount of "outside time" for encouraging elimination behavior. The amount of human interaction greatly decreases during a kennel stay, along with being placed into social isolation and unfamiliar surroundings. Canine stress levels have the potential to rise in response to these changes in stimuli. Stress levels can be measured by measuring cortisol levels being released in the body. Cortisol, often referred to as the "stress hormone," is a glucocorticoid hormone synthesized in the adrenal cortex from cholesterol. The hypothalamus, when stimulated with a stressor, releases corticotropin releasing hormone (CRH) which stimulates the anterior pituitary gland to produce adrenocorticotrophic hormone (ACTH). ACTH stimulates the adrenal gland to release cortisol. A rise in cortisol hormone in the body creates a negative feedback loop, communicating with the anterior pituitary and hypothalamus to begin shutting down certain hormone releases in order to alleviate stress. Cortisol levels can be measured in samples taken from blood, saliva, urine, or hair. This experiment compares cortisol levels taken from the saliva of canines in a kennel setting at several local boarding facilities to salivary cortisol levels in canines within their own home environment. The differences between the stress levels in the two different environments could suggest a necessary change in handling techniques within boarding facilities to alleviate as much stress on the animals as possible during their stay.

*Tests of phylogenetic hypotheses in *Mentzelia* section *Bicuspidaria* (Loasaceae) using the nuclear ITS and ETS regions*

Daisy Gomez & Caleb M. Rhodes

Previous studies based on chloroplast DNA sequences suggest that *Mentzelia* section *Bicuspidaria* (Loasaceae) is a monophyletic group consisting of 5-6 species of annual wildflowers found primarily in the southwestern United States and northwestern Mexico. In order to test this hypothesis and to facilitate further investigations of evolutionary patterns and processes, we performed phylogeny reconstructions based on DNA sequences from the internal transcribed spacer (ITS) and external transcribed spacer (ETS) regions of the high-copy nuclear ribosomal RNA genes. Our reconstructions suggest that section *Bicuspidaria* might not be monophyletic but support the chloroplast-based hypotheses that most species within

Bicuspidaria are monophyletic. Furthermore, most interspecific subclades detected within Bicuspidaria using chloroplast markers are supported by data from these nuclear markers. Although reconstructions based on these markers are not entirely consistent with chloroplast-based phylogenies, difficulties in interpreting the high-copy ITS and ETS regions have been reported in other studies, suggesting that additional data from low-copy nuclear genes may be necessary to discriminate between these competing phylogenetic hypotheses.

*Excavation and Restoration of *Tylosaurus* Skull*

Hannah Seah

In 2000, the skull of a *Tylosaurus* from the Upper Cretaceous was excavated from the Boquillas formation near Terlingua, located in Big Bend National Park. Since then, the skull has toured several institutions before finding a home in the Natural History Collection of Abilene Christian University. Our original intent was to fully extract the skull from the surrounding matrix, and reconstruct the skull for display in the new lobby of the Onstead Science Building. However, as we unearthed more of the skull, it became apparent that such an endeavor would require more time and resources than was possible. Instead, it was decided to simply clean and mount the skull, as it was, in a constructed frame for display. Some restoration to badly fractured areas such as the rostrum and some broken teeth was completed, as well as highlights to pterygoid teeth. There is little more to be done to the skull itself, all that remains is to clean up the surrounding plaster jacket, and construction of the display frame.

*Differences in Habitat Niches of Two Haplotypes of the Species *Mentzelia hirsutissima* (Loasaceae)*

Alexandria Giles & Brandi Prado

Mentzelia section Bicuspidaria is a group of annual wildflowers native to the southwestern United States and northern Mexico. *Mentzelia hirsutissima* is a species restricted to sections of the Mojave and Sonoran deserts in California and Baja California with two chloroplast DNA haplotypes identified by Rogers et al. (2015). The Rogers project suggested that these may be two different species, but also that not much is known about the distinction between these haplotypes outside of their genetic differences. In this research project, we attempted to ascertain if there is an ecological difference between these two haplotypes. To do this, we corroborated known locations of both haplotypes of *M. hirsutissima* in this region and used these data to predict and compare their climate niches and the possible effects of climate change on their future potential habitats. Our original data and the prediction maps we created from those data were obtained using specimens from the ACU Herbarium, records from the Global Biodiversity Information Facility (www.gbif.org) and the WorldClim database (Hijmans et al. 2005), and the Maxent (Phillips et al. 2004) and DIVA-GIS (Hijmans et al. 2001) mapping programs. Our results indicate that if current warming trends continue in the area then *M. hirsutissima* will lose large parts of its potential habitat. The southern haplotype in particular will be much more greatly restricted, confirming our hypothesis of significant differences between these two types beyond their genotypes and supporting the possibility that they may in fact be separate species. However, more study is needed to confirm this.

*Characterization of Cytochrome p450 Genes in the Horn Fly, *Haematobia irritans*, Using Molecular Cloning*

Maedgen Lindsey, Nathan Dougherty, & James Nix

Cytochrome p450 genes (CYP's) encode for enzymes involved in various metabolizing reactions, including detoxification by monooxygenases, which are associated with degradation of chemical compounds, such as pyrethroids and organophosphates. This study seeks to isolate and sequence the CYP genes in *Haematobia irritans* (horn flies). To accomplish this, mRNAs were extracted from horn flies and cDNAs were synthesized through reverse transcription. Primers were designed to facilitate replication of the CYP sequence using RACE and Nested polymerase chain reaction (PCR) assays. Amplified segments of DNA around 1k bp were excised, purified using a Zymoclean kit, precipitated using Pellet Paint NF Co-Precipitant, inserted into linearized vectors using TOPO cloning methods and transfected into competent *E. coli* cells. Transformed cells were cultured on lysogeny agar plates with ampicillin (LA+Amp) bonded with X-gal to utilize blue-white screening. Colonies containing recombinant plasmids were extracted from the plates and re-cultured in LB +Amp. Plasmid extraction was carried out using a Qiagen Miniprep kit. Verification of plasmid isolation included restriction enzyme digestion with observation of bands around 1k bp and 3k bp, and NanoDrop analysis of nucleic acid concentration. 138 samples were sequenced and comparatively analyzed using NCBI BLASTN, which indicated successful cloning of horn fly DNA, including target p450 genes. 21 samples failed to sequence, 23 samples contained only plasmid DNA, and 94 samples contained a plasmid with *H. irritans* DNA inserted between EcoRI cutting sites. Of 58 gene sequences with highly probable similarity to sequences from *H. irritans*, flies, or other related insect species, 4 were locally similar to p450 genes in *Calliphora stygia*, *Musca domestica*, and *Stomoxys calcitrans* and an additional 2 were similar to catfish and fungal p450 genes.

AFTERNOON SESSIONS

Tuesday, April 5, 1:30 – 2:50 PM

Session C1: International Issues - McCaleb Room Zone A

The Growth and Development of Scottish Nationalism and the Desire for Independence Since the 1950s

Kirby Lemon

The purpose of this research is to analyze the change in Scottish nationalism starting in the 1950s leading up to the failed referendum for Scottish independence from the United Kingdom. Although the desire for Scottish independence can be traced to the initial union with England under James I, there has been a distinct shift in Scottish nationalism in the last 65 years, a shift marked by clear changes in the language used by the Scottish National Party and the Scottish people in SNP manifestos, pamphlets, and other documents, including voting data. The language shift also indicates a change in the subjects of importance; for example, foreign affairs and economics are being used more frequently than ever before, which indicates a more practical approach to independence. This research will evaluate the distancing of Scotland from Westminster as a more autonomous nation and the possible reasons for the failure of the 2014 referendum.

Australian Aborigines

Deanna Tuttle

The Australian Indigenous community bears a long history of poor attempts at assimilation, and tensions lie between the need to preserve Aboriginal culture and autonomy versus the progression of Aboriginal communities through integration into mainstream Australian society. While seeming contradictions have led state policymakers in an attempt to improve the lives of Indigenous peoples, these endeavors have not made a significant positive impact, even after decades of reconciliation. Today Aborigines are the most disadvantaged peoples in Australia; their communities are overrun with mental, physical and sexual abuse as well as alcoholism, re-incarceration, low education attainment, unemployment, and health problems. A cycle of individual social disadvantage has led to hopelessness, a loss of identity, and a reliance on government subsidies. This social science research will analyze how the Indigenous condition has been affected by assimilation, integration, and multiculturalism, clarifying the variance between each term. Examination will conclude with a complex discussion of why many challenges still exist among the Aboriginal people, focusing on policymaking, case studies of university students, and cultural insensitivity. This study is significant for anthropology and could help Australian civilians, government, organizations, and social workers better understand the complex nature of Australian Indigenous marginalization, which is the problem needing to be addressed. Due to the complex nature of the issue I do not propose a simple solution; I do suggest that culture ought to be not a hindrance to improving the Indigenous condition, but an integral part of the solution.

Community-based Social Work in Haiti: Reunifying Homeless Families

Brie Heinrich

Background: Since the 2010 earthquake, the number of homeless/unaccompanied youth in Haiti has drastically increased. The western response has typically been establishing orphanages for these children. It is estimated, however, that approximately 85% of these children have families (www.haitimama.org). These families are not caring for their children due to poverty and the belief that orphanages provide better resources for children. This study aimed to measure the effectiveness of community based social work in increasing appropriate development of these youth through family reunification versus placing children in institutional care. The social workers aim to reunify families and empower them through education, employment, and community.

Methods: The quasi-experimental study compared levels of peer/parental attachment, self-care skills, and appropriate medical developmental factors (BMI, nutrition) between formerly homeless Haitian youths (N = 32) reunified with families and those currently in orphanage care. The study was conducted in Port-au-Prince, Haiti during the summer of 2015. Researchers conducted structured interviews of the youth throughout three orphanages and two reunification programs. Appropriate statistical procedures were used to compare means and determine correlations.

Results: No significant difference was found in levels of caregiver attachment between the two groups ($p=.153$). Overall, levels of attachment increased over time among children reunified with families. There was also no significant difference in levels of nutrition (BMI) between the two groups ($p=.971$), with all children falling within the acceptable range of BMI (World Health Organization). **Implications:**

Tracking Sanctions Relief: How Iran spends 100 Billion

Sion Alford

The January 16, 2016, "Implementation Day" triggered a huge flow of money toward the Islamic Republic of Iran from various banks around the world. This day marked the moment the Joint Comprehensive Plan of Action became effective and economic sanctions were lifted against Iran in exchange for it limiting its nuclear program. Although some monies and business transactions will remain off-limits due to continuing U.S. sanctions on Iran's terrorism, human rights record, and ballistic missile program, there will billions of dollars involved in the JCPOA-related sanctions relief. How will Iran spend this money? The U.S. did not restrict this, a negotiating position which has since been much criticized since it was dealing with the world's largest supporter of terrorism. The government of Iran insists it will spend these funds on public works and economic

development, noting that the unfair sanctions had stagnated the country's development, and that hundreds of billions of dollars are needed to bring the country into the 21st century and strengthen the sagging infrastructure. In the first three months of the JCPOA sanctions relief, how will Iran spend its returned funds? Will the sanctions relief be spent on domestic purposes such as highways and infrastructure, welfare programs, and education, or will it instead disappear into monies earmarked for terrorism, such as by Hezbollah? This project will use open source information, U.S. Treasury reporting, Congressional hearings, think tanks, and NGO estimates, which are tracking parts of this funding, and interviews to present data regarding Iran's use of its sanctions-related funds.

Mexico's Battle Against the Drug Trafficking and Culture

Itzel Garcia De Alba

Mexico's social and economic discipline has slowly been deteriorating and has caused the current drug war. Throughout the following research, Mexico's governmental corruption will be analyzed, in congruency with the drug trade world and how each affects one another. This paper's focus will be examining the historical background of what led to Mexico's drug trafficking issue and the causes and effects drug cartels have had on Mexico's governmental institutions. The imbalance of power has caused illegal trade and crime rates to increase, resulting in the illegal partnership of drug cartels and governmental officials in Mexico. In the last two decades, the corruption has slowly been increasing among the legislative branch, and in effect caused a judicial independence. Previous governmental systems in Mexico have lacked the ability to strategize against illegal drug trade and bribery, putting their governmental authoritarian power where it is today. The following research will analyze the internal and external factors causing the drug war in Mexico, such as the corruption and bribery, and their impact on the political history.

Session C2: Chemistry, Biochemistry, and Physics Research – McCaleb Zone B

Teaching Introductory Physics through Visual Computational Models

Vicente Rojas

The creation and development of visual computational models can facilitate a student's understanding of introductory physics and engineering. Through the exposure of simple programming instructions and scripts, students are engaged in developing 3D visual computational models that describe physical systems. Using Visual Python, a real-time 3D model of the Sun-Earth-Moon system was developed to explore Newton's laws of motion and vector addition. A rocket with a mission to the moon was implemented to make the model more appealing to the student. This model and its further development is discussed.

Observing a binary black-hole merger in a matched-filter search

Hannah Hamilton

On September 14, 2015, the Laser Interferometer Gravitational-Wave Observatory (LIGO) made the first direct detection of gravitational waves from two black holes merging into a single black hole. The signal was identified as astrophysical with very high confidence by the offline, matched-filter PyCBC search. In this talk, we will explain what a matched-filter search is, and how the PyCBC search detected this event and bounded its significance.

In Vitro synthesis of mvaE and mvaS in Expression Vector pDUET

Chandler Graf & Amanda McCormick

The mevalonate pathway serves both eukaryotes and archaea, as well as some bacteria, as an essential biochemical pathway used in the synthesis of isoprenoids. The first three enzymes of this pathway are acetyl Co-A thiolase, HMG Co-A Synthase, and HMG Co- reductase. Two genes, mvaE and mvaS have been isolated to code for fusion, and synthase proteins of this pathway respectively. The fusion protein serves as both the acetyl Co-A thiolase and HMG Co- reductase in this pathway. Because the synthase protein acts in the pathway between the thiolase and reductase, it implies a possible association between the two proteins. This research has focused on the proposed idea that the presence of these two genes if expressed together, would allow researchers to gain understanding of possible interaction with each other. Current understanding of these proteins, specifically the fusion, is less than adequate and much confusion stems from unknown multimeric state and structure of the fusion protein. Previous studies have led researchers to believe that these two proteins of interest could be of structural and functional importance to another. By means of restriction digest, subsequent ligation, and transformation into E. coli cells, current research is aimed at achieving this dual expression of both genes. Research of this nature hopes to provide better understanding of organisms' metabolism, specifically to help better the use and efficacy of antibiotics.

The Role of H2A.Z During the Oxidative Stress Response in Yeast

Julia Taylor & Kelsie Roberts

Cells respond to environmental cues by changing gene expression patterns. One such environmental cue is the presence of reactive oxygen species (ROS). Accumulation of ROS is caused by external factors such as radiation and alcohol, and internal factors such as electrons leaking from the electron transport chain. ROS are damaging to DNA, proteins, and many other important biological molecules. Cells respond to these oxidizing species by turning on genes that will help defend against these molecules. Modifying gene expression patterns in response to an environmental cue relies on a multitude of proteins. Here, we are particularly interested in the function of a histone protein called H2A.Z. Histones are proteins which complex with the DNA to form nucleosomes. The presence of nucleosomes at a certain location greatly influences the amount of expression of any given gene. H2A.Z at a gene promoter can coincide with especially high or low levels of transcription, although the mechanism behind this is unknown. Ultimately, we seek to understand whether the presence of the variant histone H2A.Z is required for proper gene expression during the response to oxidative stress in the model organism budding yeast. In order to investigate the role of H2A.Z during this response, RNA was isolated from cells missing this protein. Next, reverse transcriptase real time PCR was used to quantify RNA levels from genes induced by oxidizing agents. We found no dramatic effect of deletion of H2A.Z, suggesting that the variant is not essential at the genes tested (all of which are responsive to oxidative stress). However, although our results did not reveal a large role for H2A.Z, they did reveal unexpected insights into the oxidative stress response in yeast.

Oxidation of Hydrated Hydrogen Sulfide

Sarah Floris

Non-renewable energy resources are becoming depleted. Storing solar energy in the chemical bonds of molecules is an attractive alternative. The splitting of water into hydrogen and oxygen is one potentially viable option; however, many mechanistic details remain unknown. Motivated by the known similar oxidation of the hydrogen sulfide (H_2S) in hydrothermal vents, this work seeks to investigate the oxidation mechanisms in mixed hydrogen sulfide/water model complexes. Quantum structures, properties, spectroscopic signatures, and relative energies are presented for the oxidized hydrogen sulfide dimer, $[(H_2S)(H_2S)]^+$, and the mixed dimer, $[(H_2S)(H_2O)]^+$, using high-level coupled-cluster approaches and appropriately benchmarked density functionals. The mixed dimer is found to exhibit traits intermediate to the limiting regimes of oxidized water (a proton-transferred, ion-radical complex $H_3O^+...OH$) and oxidized hydrogen sulfide (a hemi-bonded complex, $[H_2S]^{2+}$). Further electronic inquiry highlighted similarities with oxidized water. These results provide fundamental properties which begin to depict the environment and unique chemistry surrounding hydrothermal vents.

Session C3. Nursing and Health Focus - Alumni Conference Room

What You Know and What You Do: The Energy Drink Enigma

Bethany Miracle, Katherine Hager, & Marquita Bugg

In the United States the highest incidence of energy drink consumption is recorded among the young adult population. The Center for Disease Control and Prevention (CDC) reports 34% of 18-24 year olds consume energy drinks. The large variety of energy drinks currently on the market can pose many negative risks to one's health. In the CDC study, side effects reported included jolt and crash episodes, heart palpitations, headaches, and altered sleep patterns. The objective of this exploratory descriptive study was to determine the prevalence of energy drink consumption among young adults and their knowledge about the side effects. Upon approval of the IRB at Abilene Christian University, The Energy Enhancing Substance Use Among College Students Survey was emailed to college students on several campuses. Additionally, students could forward the electronic link to the anonymous survey to friends at other colleges. Descriptive statistics and correlations were used in determining the results of the study. The sample included 1,018 participants with nearly 70% reporting having consumed energy drinks. Sixty-six percent were uninformed of the actual amount of caffeine present in energy drinks. In response to the open-ended question regarding knowledge of the side effects, most often cited effects included heart problems and jitteriness. Participants also revealed a minimal understanding of the negative impact on health, yet continued to support the industry by persistent consumption. Further research and education of young adults about energy drink consumption and the potential health consequences is warranted.

Stethoscopes: Instruments of Inspection or Instruments of Infection?

Amy Pinegar, Katherine Conder, & Mykayla Gunderson

The purpose of the exploratory quantitative study was to discover the frequency with which stethoscopes are cleaned in the patient environment, the methods used to clean them, and potential barriers to this practice. Healthcare providers are at a unique and vulnerable level in the patient care setting where cleanliness is of the utmost importance. Research has shown that stethoscopes are often fomites and transfer bacteria when they are not cleaned properly. If nurses wash their hands often and thoroughly, yet do not clean their stethoscopes, the bacteria have a high probability of being transferred from patient to patient. Upon approval of the IRB at Abilene Christian University and a local hospital, The Stethoscope Hygiene Survey was sent to the local hospital using a secure Survey Monkey account. Descriptive statistics and correlation were used to examine the results of the sample ($n = 175$). Forty-eight percent reported cleaning stethoscopes between patients. It was found that education level of nurses correlated with how often they cleaned the stethoscope in a single shift. More than 75% reported

never having received education about this practice. Twenty-three percent (n= 41) of nurses with a Bachelor's Degree cleaned their stethoscopes compared to 12.7% (n=22) of nurses with an Associate's Degree. Of those who did not clean their stethoscopes between each patient, 26.9% declared this was due to "forgetfulness." The study revealed the need for education about the importance of proper stethoscope cleaning related to infection control. Future research should focus on increasing awareness of the importance of such a practice and education about the potential for healthcare associated infections related to stethoscope contamination in the patient care environment.

Electronic Medical Record's Influence on Health Care Providers

Jessica Ragan, Sheridan Waugh, & Jacque Diaz

Driven by a constant ambition to improve the practice of medicine and patient safety, health care is a field that tirelessly seeks to improve its quality of service and understanding of science. One notable milestone in the past decade has been the sweeping transition from using paper documentation to electronic medical record (EMR) charting in all patient care environments. Research has shown that nurses deemed electronic methods inappropriate and in need of improvement. The purpose of this pilot study was to explore the attitudes held by hospital staff and to examine their perceived proficiency or personal hindrances with electronic documentation. Upon approval of the IRB at Abilene Christian University, Electronic Medical Record's Influence on Health Care Providers was sent to a local hospital using a secure Survey Monkey account. Descriptive statistics were used to analyze the results of the sample (n = 72). The study revealed that 59.7% of hospital employees were satisfied with EMR use and 49.7% (n = 30) considered EMR documentation to be more thorough than written documentation. Questions about using EMR was reported as weekly (31%) and monthly (43.7%) with 68.7 % reporting that answers were easily accessible. In the open ended responses, it was commonly identified that employees valued EMR documentation for their "accessibility, organization, convenience," and "time efficiency". However, other common remarks concerning the downside of EMR use pointed to technology glitches and system failures. Our study findings shows an improved attitude regarding electronic documentation compared to prior research. Future research should focus on assessing the competency of both the user and the electronic system in a larger cohort.

The Possible Health Effects of 12-hour Shifts On Nurses

Megan Styskal & Melanie Chavarria

The purpose of this pilot study was to explore the potential effects of working 12-hour shifts on nurses' health and to increase awareness about these effects. Upon approval of the IRB at Abilene Christian University and a local hospital, The Health Impact of 12-Hour Shifts Survey was emailed to bedside nurses using a secure Survey Monkey account. Descriptive statistics were used to examine the results of the sample population (n = 120). Seventy-five percent of nurses reported sleeping an average of six to seven hours a night, which is less than The National Sleep Foundation recommendation of seven to nine hours. Fifteen percent reported sleeping less than five hours per night and 30% percent rated their fatigue level as seven to eight on a scale of zero to ten. Sixty-six percent of nurses reported drinking less than two glasses of water during a shift with 47.5% using the restroom only twice per shift. The study revealed the need for education about the importance of health promotion and awareness of self-care among bedside nurses working 12-hour shifts. Future research should focus on educational interventions related to adequate sleep and hydration.

Elucidating the Mechanism of Cadaverine in the Nitrosative Stress Response of Uropathogenic Escherichia coli

Kristen Clemons

During a urinary tract infection, the infectious agent uropathogenic Escherichia coli (UPEC) elicit a number of host inflammatory response pathways, including the increased generation of reactive nitrogen species (RNS). Unlike non-pathogenic K-12 strains, UPEC can respond to and resolve this nitrosative stress. Previous research in our lab has indicated that UPEC adaptation to RNS is linked to the polyamine cadaverine. UPEC strains lacking either the *cadA* or *cadC* gene are unable to produce cadaverine; consequently, these mutant strains are unable to grow in the presence of 3 mM RNS unless grown in cadaverine-supplemented media. Although implicating cadaverine, these data do not elucidate the mechanism through which cadaverine provides resistance to RNS. To determine this mechanism, the Δ *cadA* and Δ *cadC* strains were mutagenized and screened for loss of rescue by exogenous cadaverine. In this project, the genes identified by the screen were mapped via arbitrary PCR. Among the genes mapped were *menA* and *yieN*. To confirm the involvement of these genes, Splicing Overlap Extension (SOE) PCR was used to construct *menA* and *yieN* SOE PCR products containing a *tetR* cassette. The *menA* SOE PCR product has been transformed into the *E. coli* K12 strain MG1655 and will be moved by phage transduction into UPEC strain UTI89. Upon construction of the UTI89 Δ *menA* and Δ *yieN* strains, analyzing the mutant strain growth in the presence of RNS will test these genes' role in the nitrosative stress response of UPEC. Furthermore, other genes identified through the arbitrary PCR process will be investigated.

Session C4: Theater, Film, and Television - LYNAY Classroom

Happily Ever After is a Choice: A Rhetorical Analysis of Once Upon A Time

Abby Altom

This essay explores Edward Kitsis and Adam Horowitz's TV series, Once Upon A Time. Specifically, I address the question: How do rhetors use television shows to argue that individuals are in a constant struggle to change their destiny? To answer this question, I use a variety of rhetorical tools related to argumentation, visuals, narratives, and language to discuss several themes in the show, including good and evil, happiness, predestination, and fear. Ultimately, I argue that Once Upon A Time persuades both children and adults that they can work to succeed in life and should not settle, but should fight to earn the life they truly want.

Hands on a Hardbody Dramaturgy

Andrew Bullard

In ACU's upcoming production of Hands on a Hardbody, we go to Longview, Texas in the early 1990's and watch a competition for a Nissan truck unfold before our eyes. The musical itself is based on a documentary that filmed this event. With the help of the creative team, my job will be to know the show, storyline, and the background of the event. My duties will be to make study guides for the cast as they dive into the rehearsal process and making sure they have the materials needed to understand their individual characters. I am also responsible for the talkback session after one of the performances and leading the audience in questions for the cast and team. This information is vital to the team as they start finding out more about their world. I will be researching the movie and the climate of Longview around that particular time. My research will also show detail in the competition itself and the War in the Middle East as well. Through my research, I hope to help the cast portray their characters as realistic as possible and also show truth within their performances. A dramaturge's job is to accompany the cast and making sure that the actors are grounded to the world of the play. At the end of this project, I hope to bring the audience into this world and I hope that they take away a powerful message of acceptance, not only of themselves but also of other people.

Morality and the Horror Film: Towards a Greater Understanding of the Problem of Evil

James Churchill

In Christian communities, horror films are often written off as examples of mere exploitation. While this is undeniably characteristic of a large number of films in the genre, there are some excellent horror movies that have been unfairly condemned as a result of this kind of thinking. A significant number of films released during the Horror Movie Renaissance of the 60's and 70's managed to bring psychological depth and social commentary to what was previously a shallow genre. They used the genre conventions as a springboard to develop analyses of the human condition and the origins of evil. To illustrate this point, I would like to focus on two seminal films in the development of modern horror: Rosemary's Baby (1968), and The Wicker Man (1973). I will apply a sociological lens to these films, illustrating the ways in which environments shape individuals. In both movies, evil actions are not excused, but they are contextualized. The villains are viewed not as inaccessible cretins, but as real people that are products of their environments. Years and years of indoctrination allow the characters to rationalize their destructive behavior. In order to fully address the problem of evil, we must avoid the trap of one-dimensional thinking, the temptation to label people as monsters. Quality horror films can shed some light on this issue. Evil must be analyzed, contextualized, and understood before it can be combatted. Rosemary's Baby and The Wicker Man provide insightful commentary on the nature of evil, and they offer proof that the horror film can serve as an important vehicle for communicating moral truths.

Tuesday, April 5, 3:00 – 4:20 PM

Session D1: Mental and Physical Health - McCaleb Room Zone A

An Underserved Population: Rural Mental Health Needs in West Texas

Emily Turner, Alex Lim, Vivian Teoh, Mandy Campos, Megan Verette, & Cassie Dennis

The purpose of this study was to attempt to identify mental health needs in rural West Texas communities. We created an online survey through Survey Monkey that was sent to people in various professions living in rural communities that would most likely encounter people struggling with mental health concerns. These professions included law enforcement, pastors, school counselors, school administrators, teachers, physicians, nurses, professional counselors (e.g., licensed professional counselors or psychologists), and social workers. We asked these professions to identify the primary mental health needs in their respective rural communities, and how often they encounter people with mental health needs. We asked what their typical response would be when they encountered mental health concerns, and whether or not they had any mental health training. We also asked about mental health services in their respective rural communities, assuming there were any. Finally, we inquired as to whether or not their rural communities would be interested in telemental health services, such as online videoconferencing (counseling), if this service was available.

The Personality Spectrum Analysis

Caroline Frey, Allison Kuster, Madison Houston, Destiny Eaton, Blair Davis, Peggy Speetzen, & Daniel Martin Since the ancient Greeks, it has been hypothesized that people have inborn personality traits that differentiate one person from another. As personality theories developed, it was thought that those traits could be grouped into overarching personality types to help understand differences and similarities in others. Research was conducted to construct and validate a new personality assessment called the Personality Spectrum Analysis. Using factor analysis, six personality types were identified and labeled: Leadership, Achievement, Stability, Compassion, Optimism, and Relationship. One benefit in using personality assessment is to help identify strengths and interests to ascertain learning styles and possible career paths (Myers, McCaulley, Quenk, & Hammer, 2003). Personality is important to occupation. Certain traits are well suited to particular careers or types of jobs. Looking at motivation, responsibility, and the independence of a personality type can assist in making a successful job choice. Personality types can also impact communication and teamwork among colleagues (Myers, McCaulley, Quenk, & Hammer, 2003). In addition to looking at the construction and validation of the Personality Spectrum Analysis, this research looked at the relationship between personality type, income, occupation, and how happy research participants were in their occupation.

Love is a Battlefield: Experience of Love and Depression

Laura Hill

In an attempt to discover if there is a relationship between experience of love and depression, a survey was created to assess these variables. The survey included the Experience of Love Questionnaire (ELQ), a scale created for this study, and the Center for Epidemiological Studies Depression scale. The ELQ consisted of three subscales measuring experience of love in family, friends, and romantic relationships. 103 people completed the survey and results suggest that a correlation does exist between the variables. These results could lead to a belief that depressive symptoms could decrease if relationships and perceptions of love improve.

Hospital Billing: Who Pays The Most? A Comparison of Hospital Billing Between Public and Private Insured Patients

Nia Tyler

This is a study that compares the methods that hospitals use to determine the billing and collections of patients who are insured by Medicare, Medicaid, or private insured companies. The scope for interpreting this research was conducted by using a mixed methodology that required an in-depth interview with a retired health care administrator and research that was specifically studied to analyze the administration costs of hospitals. The research that was found showed that the process of hospital billing is the same for every patient. However, there is a difference when the insurance companies are paying the hospitals.

Effects of Fatigue on the Cognitive-Linguistic Features of a Person with TBI

Ashley Raybon

This study explored how fatigue affects the language features of a college student who has a traumatic brain injury. The study used interviews containing open-ended questions. Five themes of cognitive-linguistic features emerged: repetitions, number of pauses, pause length, Mean Length of Utterance (MLU), and filler words. Though the case study only analyzed one participant, findings could further be implemented for other college students with a traumatic brain injury. Together, these findings suggest that fatigue does affect the language of individuals who have traumatic brain injuries.

Session D2: Contemporary Communication - Alumni Conference Room

Twitter and Islamic State: Communication Networks and the Rise of Terror States in the Middle East

Grace Rosa, Nick Cartwright, & Kevin Shurtz

The rise of Islamic State has proven to be one of the distressing developments of the past year. Not only does this organization threaten the lives of millions, it has complicated relations among global and regional powers such as the United States, Russia, Saudi Arabia, and Iran. Strong communication networks have been key to ISIS' effectiveness, and a recent lawsuit Fields v Twitter, Inc. in federal district court in California has brought this question to the national forefront. The connection between Twitter, a platform used by individuals worldwide, and ISIS, an organization with an apocalyptic and brutal mission to build a Caliphate, is simple--ISIS uses it, and uses it extensively. The Islamic State contacts prospective recruits through a variety of outreach channels including Twitter, Tumblr, and the deep web. ISIS also depends upon Twitter for much of its battlefield communications and everyday government decisions. In short, with Twitter and its reliable and virtually instant communication assistance, ISIS is allegedly able to operate. This project will attempt to verify the claims of the Fields case and present the wider picture of how other communications platforms such as Facebook have dealt with terror messages. Methodology will include contacting government officials actively combating ISIS and compile their experiences into a comprehensive picture of how ISIS operates in today's networked world. Reports from organizations and interviews with communications company representatives, including Twitter, and legal sources will be used. This will also allow

consideration of First Amendment issues. This project aims to present a convicting presentation of how ISIS uses Twitter and whether Western countries can prevent the Islamic State from making further advances.

Poldark

Kimberly Hauser

This essay examines how Debbie Horsfield's British drama, Poldark, illustrates the value of equality by using specific rhetorical tools in the series' visuals, arguments, narratives, and language. This television series has no doubt been a major influence on many people because of its extreme popularity, and therefore, it is imperative to understand what values it portrays to gain a deeper understanding of what it is communicating. To further explore why Horsfield chose the topic of equality to be emphasized in this series, I set out to answer this question in my analysis: "what rhetorical strategies do television screenwriters use to reflect a nation's values?" I will be analyzing episodes three and six, which contain some of the strongest examples of equality in the series, to illustrate how this television show portrays and challenges the concept of equality. The first two sections of the essay will contain arguments and visuals together because Horsfield's claims, that achieving economic equality and challenging the social norms are crucial for true equality, are mainly communicated visually. Then, narratives and language will be together in the following section to show how the plot and specific language tools reflect that equality requires respect. The last section will be over language, again, to show how Horsfield portrays the topic of equality as equating to justice.

The Curious Case of Texas' Third Party Privilege

Allison Brown

Since 1990, journalists and lawyers alike have operated under the belief that they had a powerful protection against libel lawsuits when reporting third party allegations about matters of public concern. Subsequent lower court cases relied on this doctrine in the years that followed. But, after more than two decades, the Texas Supreme Court threw the jurisprudence into discord by ruling in a 2011 case that the privilege didn't exist in common law and in fact never had existed. The Texas legislature responded to this abrupt about-face in the summer of 2015 by crafting and passing an apparently sweeping third party allegation privilege that restores and perhaps even expands the protections journalists have in such cases. Little legal scholarship has examined the circuitous history of this privilege and its potential for limiting libel claims against media. This study hinges on analysis of two cases, McIlvain v. Jacobs, 794 S.W.2d 14 (Tex. 1990), and Neely v. Wilson, 331 S.W.3d 900 (Tex. App. 2011), and jurisprudence between the two. Additionally, the research considers the implications of Senate Bill 627, which expands the truth-as-a-defense provision of Texas libel law, and discusses the future effects of the law and privilege for media across the state. This conversation is an important one as the world of journalism continues to move at an increasingly faster pace. As the new law settles into place, the boundaries of the privilege will be tested in the future. With increased access to channels for online publication, the risk of individuals publishing potentially defamatory third party allegations rises, but as this study shows, restricting the media's right to publish such material would undermine their historical right in society to hold those in power accountable for actions.

Perceptions of Crime Seriousness

Amanda Stephens

Crime in the United States has been and will continue to be a public problem. Thus, it is important to know how the public perceives different types of crime. For the focus of this study, perceptions of crime seriousness will be analyzed based on the race of the criminal and the type of crime committed (white-collar vs. non-violent street crime) as the variables of interest. This exploratory research will be used to discover the relationship between the factors of a specific crime and the public's perception of the seriousness of that crime. Surveys will be administered to the student body and faculty of Abilene Christian University. These surveys will present questions in the form of a case study in order to identify how one's perception of crime seriousness changes as the two independent variables change. This is foundational research for directly analyzing the effects of race and type of crime on a community's perception of crime seriousness by using different case studies to present the scenarios. Other studies have looked at these variables of interest, but none have been completed here in the United States. The goal of this study is to reveal any biases present within the Abilene Christian University community that could explain a difference in perceptions of crime seriousness. It is likely that the public's perception of crime seriousness influences the perceived effectiveness of the criminal justice system here in the United States.

Session D4: Investigating Plants and Animals - AT&T Theater

Phylogenetic relationships and patterns of homoplasy in Mentzelia section Bicuspidaria (Loasaceae)

Denise Naude, Christian Hofsommer, Stephanie Sariles, & Gabriela Simonsen

Mentzelia section Bicuspidaria (Loasaceae) is a group of 5-6 species of annual wildflowers found primarily in the southwestern United States and northwestern Mexico. We employed phylogeny reconstructions based on DNA sequences from the plastid trnH-psbA, trnS-trnG, trnS-trnF, ndhF-rpl32, and rpl32-trnL regions to investigate evolutionary relationships and patterns of

homoplasy in *Mentzelia*. Our reconstructions indicate that section Bicuspidaria is monophyletic and that most species within Bicuspidaria are monophyletic. However DNA based reconstructions suggest that the taxon, *M. hirsutissima*, is paraphyletic. Furthermore, the two clades of *M. hirsutissima* sensu lato can be distinguished geographically but not morphologically. In contrast, the most morphologically distinct species in Bicuspidaria, *M. reflexa* is closely related to other species within a subclade of Bicuspidaria, suggesting that the unique flora morphology of *M. reflexa* is an autapomorphy with an origin independent from similar characters that have evolved in other sections. Similarly, floral characteristics for *M. involucrata* appear to have originated independently in section Bicuspidaria and in species from other sections of *Mentzelia*.

Relationships between small mammal assemblages and land management in the southeastern Rolling Plains

Catherine Longest, Jamie Thompson, Daisy Gomez, Leneka Hagins, Nathan Neill, Reece Wells, & James Nix
Prairie restoration is an increasingly important facet of land management in central Texas. In order to understand the ecological impacts of changes in land use, complex relationships between abiotic and biotic variables must be described. In this study we investigate relationships between soils, vegetation, and small mammal populations under four different management histories in the southeastern Rolling Plains. Surveys were conducted on four adjacent range sites with the following management histories: 1) unrestored oldfield with discontinued cultivation, no grazing, no vegetation management, 2) kleingrass/pricklypear/mesquite pasture with introduced forage, intensive grazing, minimal vegetation management, 3) mesquite shrubland with native vegetation, unrestrained grazing, no vegetation management, and 4) restored prairie: reintroduced native tall grasses, no grazing, shrub mitigation management. Sampling was conducted during spring, summer, and fall from a 50 x 50 m grid positioned in the interior of each site. Soils were sampled for chemical and physical properties from the corners and center of each grid; vascular plant species composition was sampled using 9 meter-square quadrats from the edges and center of each grid; and the small mammal assemblage was measured using a 5 x 10 grid of Sherman live traps. Small mammal assemblages differed substantially across treatments and seasons. Lowest mammal quantity and diversity occurred in the unrestored oldfield. Mammal assemblages at other sites varied seasonally, with greatest overall diversity occurring in the restored prairie.

To Vaccinate Or Not To Vaccinate: Discouraging Factors for Pet Owners Taking Their Pets to the Veterinarian for Vaccinations

Ingrid Rojas

As the population of dogs and cats owned as a companion animal grows, the amount of visits to the veterinary's office decreases. The falling number of visits may mean that veterinary services, such as vaccinations, are declining as well. Pet vaccinations not only provide immunization, but also serve as an opportunity for pet owners to gain knowledge about pet health problems, management, and care from professionals. Because there is limited research, an online survey was conducted on how many dogs and cats as pets receive vaccinations and what main factors discourage pet owners in their decision-making process. The majority of respondents were 25-44 years of age, female, White Caucasian, married, completed graduate school, had an average household income of \$50,000-99,999, and lived in Texas. There were three factors that were shown to have a major impact on pet owners, both with vaccinated and unvaccinated pets. These factors were economic costs, time, and hassle.

Evaluating the Effectiveness of Prostaglandin Injections and Artificial Lighting in Stimulating Off Season Cycling in Mares

Sara Bishop

Off season cycling is important for highly competitive horse owners who are looking to build the biggest horses, with the youngest registration age and with the best blood lines. The objective of this project is to evaluate the differences in off season cycling of reproductively sound mares when given doses of prostaglandins or placed in artificial lighting. Typically mares who have been induced into off season ovulation are part of an embryonic transfer program and serve as surrogate mothers to a foal. This allows the genetic mare to remain in peak physical shape and continue in their athletic season without missing time for gestation and lactation. Three pens were set up to each house thirty mares with access to grass hay. One group was given injections of prostaglandins, the second group was housed under natural lighting and artificial lighting for twelve hours a day to mimic long light breeding seasons. The third group was a control with no artificial lighting or prostaglandins. The follicle size of each of these mares was measured to determine a proper breeding time. Data was collected on the nearness of ovulation as determined by follicular development. Differences were determined by using an ultrasound to measure the size of the follicles. Mares that had follicle sizes between twenty-five and thirty millimeters were nearing, if not already in ovulation. From the control group no changes in follicle size were observed and the average follicle size remained between five and fifteen millimeters. The mares given prostaglandin treatments showed no sign of ovulation, with some mares actually having a reduction in follicle size. Mares placed under the artificial lighting displayed more than a fifty percent increase in follicular size within thirty days of treatment and even larger increases by the end of the sixty days.

