April 7, 2017

2:00 – 5:00 PM

Eccles Fine Arts Center and Performing Arts Building
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Oral Presentations – 2:00 – 3:00pm

Arts – Session I - PAB 111

2:00 pm  Liza Teo, Kathryn Syssoyeva
          Dixie State University College of the Arts

Research through Independent Study

Abstract: What is research? The systematic investigation into and study of primary sources to establish facts and reach new conclusions. What is independent study? An alternative way of learning, in which a student works independently, guided by a teacher-mentor, without the benefit of daily classes. So what differentiates research from independent study? One could argue – and it is this very argument that will be developed here – that to study independently, a student needs to perform research.

For the past two months, I have been conducting an independent study-abroad project in Theatre History, in France, under the long-distance guidance of Dr. Kathryn Syssoyeva (Department of Theatre, Dixie State University). On the basis of this project, I propose to examine the interaction between research and independent study, and consider how these intertwined learning tools have enriched my understanding of theater history and contributed to my intellectual growth. As illustrations of my methodology, I will share samples of my course presentations, including video recordings, photographs, and blog entries.

To conclude, I would like to reiterate: when I study independently, I am forced to put into place the “system of investigation or inquiry.” I then pose questions that guide me on a path of discovery. A new perspective opens the door to a whole new mode of learning. It is no longer about reading the words off a page and regurgitating them. It is about actively participating in the discovery of the facts, processing, and finally, reaching a conclusion.

2:15 pm  Hilary Ferguson, Timothy Francis
          Dixie State University College of the Arts

“The Equal-Tempered Septatonic Scale”

Abstract: The purpose of this project is to show why major and minor scales contain arrangements of whole and half steps. In my study of Music History, I’ve learned that there is a historical basis for the Greek diatonic modes and subsequently the Renaissance church modes, which were predecessors of the major and minor scales. However, there is very little explanation as to why these scales developed with whole and half steps, as opposed to a scale made from tones which are evenly spaced, or in other words, “equal-tempered.” By demonstrating the aural results of an equal-tempered septatonic scale, as well as the aural effects of the intervals between its scale degrees, we can gain insight into why tonal music has developed in the way it has. My hypothesis is that the whole and half steps are necessary to create consonant or “pleasing” intervals that are found in the harmonic series and are preferred by most listeners.

The methods used to create the equal tempered septatonic scale include using mathematical calculations to calculate an equal interval between each note in the new scale. Using the $7\sqrt{2}$ as our ratio between each note in the scale, one can calculate the frequency in Hertz of each successive note. Using a configurable tuning device, a harp can be tuned with these new calculated frequencies, forming a new scale that can be experimented with and explored. New intervals on this scale can be played, as well as a well-known song, to showing the aural effects of eliminating whole and half steps.

One of the biggest differences between this new equal tempered scale and our major scale is that there is no drive toward a tonal center. Additionally, many of the consonant intervals that we find in major and minor scales were disrupted without the whole and half steps, and many of the new intervals that were formed were dissonant, others just seemed “flat.” These results can be used in music education when teaching scales to demonstrate why whole and half steps are important.
Abstract: The Dixie Electro-Acoustic Performance ensemble is in its first semester at DSU. D.E.A.P. students create and perform sound art with electronics utilizing various operating systems and software. Ensemble members learn contemporary composition techniques, performance practice, sound synthesis, programming, and instrument design. In this session, students will present their research combining coding in Pure Data with live music performance.
Communications – Session I - PAB 124

2:00 pm  Morgan Wood, Erin Ortiz
Dixie State University College of Business and Communication

“Why Using Cell Phone’s in the Classroom is an Advantage”

Abstract: Within the past century, technology has redefined student behaviors and learning especially through the use of cell phones. Past research has provided valuable evidence of the perspectives that students and educators have towards cell phone use in the classroom as well as the affects that they have on students' performance. The purpose of this study is to provide an overview of college students' and educator's ownership, use, and perspectives of cell phone use in the classroom based upon previous research. The benefits and risks of using cell phones in the classroom vary along a wide spectrum. Within this research, however, it will be discussed that educators must be willing to adapt to the changes that technology has had on students' lives. In part one of this research, a variety of educators at the collegiate level who use cell phones in their classroom will be interviewed and asked about their perspectives of the advantages and disadvantages of cell phone use in the classroom. The second half of this research will comprise of testing a technique to determine if the use of cell phones increase the outcome of test scores. This technique will allow students to use cell phones in the classroom to answer questions based upon the instructor’s quiz. The student’s answers will be received immediately by the professor to allow him or her to clarify or expound any additional information to help his or her students to better prepare for the test.

2:15 pm  Mikaylen Hudson, Chizu Matsubara
Dixie State University College of Education

“Assisting International Students: Why modifications and accommodations are important”

Abstract: Students Helping English Language Learners (SHELL) Program at DSU is a tutoring program for international students. The tutors are education majors who apply the knowledge of Second Language Acquisition (SLA) into practice. The international students who attend tutoring sessions do not necessarily need assistance in content but rather clarification of instructors’ expectations for the assignment. This clarification is often needed due to lack of understanding American higher education standards. Students in the Elementary Education Program at DSU are trained to use Sheltered Instruction Observation Protocol (SIOP) to differentiate and accommodate all levels of students in lesson planning. Furthermore, they are required to incorporate theories, such as usage-based learning/connectionism and Monitor Model hypotheses, to best help English as a Second Language (ESL) students learn effectively. Many of the international students are ESL students. The SHELL tutoring program continues to assist international students who have exited the ESL program. These students still need assistance in explanations of academic language and cultural expectations to be successful. If these modifications and accommodations are properly implemented to all the classes at a university level, the students will become more academically adept for classroom discussions and school work. This presentation will discuss and introduce the modifications based on SLA theory that will assist the international students to be successful learners in higher education.

2:30 pm  Erin Miner, Carrie Smith
Best Friends Animal Society

“Marketing & Events for a non-profit on a budget”

Abstract: How to create an effective brand for your organization with a small budget through a consistent look, community outreach, and use of current technology.
**Humanities - Session I - ECC 155**

2:00 pm   Madison Bidinger, AmiJo Comeford  
Dixie State University College of Business and Communication  

“Women in Comics”

Abstract: Superheroes have captured the imagination of millions as well as saturated the media and all forms of entertainment. While some female superheroines are finally experiencing positive representation on the big screen, damaging misrepresentation of females in comic books overall persists today. Through careful research of scholarly essays, films, comics and academic books, this project aims to expose the lesser known world of comics and cause people to think critically about why women are represented in such polarizing ways. It is important to analyze a form of media that is having so much influence over our society but is often over looked as being frivolous. While comic books are a small percentage of the over-all media content that we are exposed to, comic book characters have become the ultimate standard for what is considered powerful and heroic, and female characters have an interesting dynamic of being good role models and sex symbols in comics. From the costuming, to the story arc and character development, female super heroes are not only a relevant topic to discuss but one that almost everyone can relate to. From Wonder Woman, who is a feminist icon as well as promoting the male fantasy, to She-hulk and her protest of hypersexualizing females, superheroines have a turbulent history in comic books. With these characters becoming so prevalent in mainstream media, and the representation of women in the media becoming more controversial, it is important to talk about female roles in a male dominated genre.

2:15 pm   Jennifer Marsh, Stephen Armstrong  
Dixie State University College of Humanities and Social Sciences

“Wandering Home: Depicting Alienation and Freedom in a Short Story”

Abstract: A short story, “I’tinerent” (misspelling deliberate) portrays the travels and labors of a young woman who abandons the traditional expectations of happiness—such as income, family and permanence—to experience what she believes to be freedom. To a certain extent, this narrative mirrors my own convictions about the connections between travel and personal identity—I chose to move away from my family so I could find my own sort of happiness, and learn to define my Self. The story utilizes three fundamental principles of fiction technique: the rite of passage narrative, symbolic renderings of the landscape and dialogue that provides insight into the personalities of the story’s characters. As a model for this piece, I looked to the short fiction of Ernest Hemingway, as well as the poetry of Robert Frost and Emily Dickinson. In short, “I’tinerent” draws upon the extensive practice and scholarship I have pursued as an undergraduate student who plans to become a professional writer.

2:30 pm   Ciera Beers, AmiJo Comeford  
Dixie State University College of Humanities and Social Sciences

“From Backpacks to Ballgowns: The Function of Education in "Ella Enchanted" and "Princess Academy"”

Abstract: “Once upon a time” is a phrase as familiar to Americans as “hello.” It is the way that fairy tales begin, and fairy tales have been the vehicle by which patriarchal values have been passed on and reinforced through generations. Multiple studies from various researchers in differing fields have shown that fairy tales play a key role in both male and female children’s acquisition of gender roles and stereotypes.

In recent years, there has been an increase in revised fairy tales written for children and teenagers which reinforce feminist values. These books feature independent, unique heroines who are actively engaged in solving problems, rather than waiting to be rescued. Two such feminist tales are Ella Enchanted by Gail Carson Levine and Princess Academy by Shannon Hale, both of which are Newbery Honor books.
Both female main characters have well-rounded personalities and are active agents in their own lives, but both are educated to make them worthy of potential husbands. In their education both girls are primarily taught how to be a lady, rather than focusing on academics. Education, especially post-high school or higher education, has served that same function throughout American history. Additionally, the both novels end their stories with an implicit or explicit “happily ever after” in which the heroine is in a relationship with the male of her choice. Although Ella Enchanted and Princess Academy are feminist revisions of traditional, patriarchal fairy tale forms, in many ways they still uphold and reinforce patriarchal values.
2:00 pm   Glory Sunday Eyere, Joseph Cartagena, Erin O’Brien  
Dixie State University College of Science and Technology  

“The reproductive success of the endangered Dwarf Bearclaw Poppy  
(Arctomecon humilis) after the localized extinction of a specialist pollinator”

Abstract: Populations of the endangered, endemic Dwarf Bearclaw Poppy (Arctomecon humilis) in Washington County, Utah were monitored to assess annual fluctuations of reproductive success. In light of the recent discovery that specialist pollinators may be locally extinct, a focus on pollinator activity was established to determine if these fertilizing species are a limiting factor to poppy reproductive success. The scope of the study was wide enough to record of additional considerations that could possibly result in low poppy numbers. 20-30 plants were monitored at each of the six poppy populations throughout the reproductive season. Fruit collected from inflorescence were evaluated for successful seed development by observing seed number and seed size. Critical analysis of reproductive trends may be crucial in determining conservation efforts, the implications of which would affect proposed development and expansion plans in surrounding communities.

2:15 pm   Vinodh Chellamuthu, Azmy Ackleh, Jacoby Carter, Baoling Ma  
Dixie State University College of Science and Technology  

“A model for the interaction of frog population dynamics with Batrachochytrium dendrobatidis, Janthinobacterium lividum and temperature and its implication for chytridiomycosis management”

Abstract: Chytridiomycosis is an emerging disease caused by the fungal pathogen Batrachochytrium dendrobatidis (Bd) that poses a serious threat to frog populations worldwide. Several studies have shown that inoculation of bacterial species Janthinobacterium lividum (Jl) can mitigate the impact of the disease. However, there are many questions regarding this interaction. A mathematical model of a frog population infected with chytridiomycosis is developed to investigate how the inoculation of Jl could reduce the impact of Bd disease on frogs. The model also illustrates the important role of temperature in disease dynamics. The model simulation results suggest possible control strategies for Jl to limit the impact of Bd in various scenarios. However, a better knowledge of Jl life cycle is needed to fully understand the interaction of Jl, Bd, temperature and frogs.

2:30 pm   John Kellam  
Bureau of Land Management  

“Revegetating fire-affected Mojave desert tortoise habitat in the Beaver Dam Wash National Conservation Area, Utah.”

Abstract: In the spring and summer of 2005/2006, wildfires burned significant portions of the Mojave Desert – including large areas of the Woodbury Desert Study Area located within the Beaver Dam Wash National Conservation Area (BDWNCA), Utah. As a result, native Mojave desert tortoise (Gopherus agassizii) populations within southwestern Utah have declined up to 50% in some areas due primarily to habitat degradation and the introduction of exotic weeds. By destroying perennial plants, which are critical resources to Mojave desert tortoises for protections and burrow sites, and altering forage quality and quantity, wildfires are changing habitat conditions and complicating recovery efforts for this threatened species. In 2016, a large-scale habitat restoration project began in the BDWNCA that involves revegetating fire-affected desert tortoise habitat with approximately 5,000 containerized native plants within a 100-acre study plot. The plot will create “fertile” islands which will act as seed banks from which native plants can
disperse. Landscape-level restoration will increase Mojave desert tortoise survivor ship and fecundity in burned areas, and help recover populations in the BDWNCA. Project partners directly involved with planting efforts include: BLM, DSU, UNLV, TNC, UDWR, and SUNCLF. This is a long-term project with many volunteer opportunities.

2:45 pm Christian Edwards
Dixie State University College of Science and Technology

“Southwestern Willow Flycatcher status and habitat restoration along the Virgin River in St George, Utah”

Abstract: The Southwestern Willow Flycatcher (Empidonax traillii extimus) was federally listed as endangered in 1995 due to population declines resulting from the loss and degradation of native riparian breeding habitat. In 2008, the Utah Division of Wildlife Resources (UDWR), in cooperation with the Virgin River Resource Management and Recovery Program, began monitoring Southwestern Willow Flycatcher status and distribution, reproductive success, and habitat use along the upper Virgin River in the vicinity of St George, Washington County, Utah. Specific objectives were to track the abundance and distribution of breeding flycatchers, to quantify reproductive success and productivity, to identify primary causes of nest failure, to identify habitat characteristics important in nest site selection, and to identify habitat characteristics associated with successful nests. Here we present results of flycatcher monitoring (2008-2016), which was preceded by the initial effects of Tamarisk Leaf Beetle (Diorhabda carinulata) biocontrol on tamarisk (Tamarix spp.) components of riparian habitat on the upper Virgin River.
Abstract: Natural organic matter (NOM), the nonliving organic matter in natural environments, is one of the most abundant form of organic matter on the earth’s surface. NOM has major functions in soils that control their physical and chemical properties so understanding how NOM operates in the environment is essential for predicting the properties of soils. Unfortunately, the complexity and inherent heterogeneity of natural organic matter makes the direct observation of the relationship between structure and its function difficult.

A new approach was developed that describes NOM as an emergent, hierarchical self-assembling or self-organizing system in which its components form ordered structures by non-covalent or weak interactions like van der Waals, hydrogen bonding and hydrophobic interactions. By using a combination of organic and aqueous treatment NOM samples of various extent of self-organization but with similar chemical composition were analyzed for properties such as resistance to microbial degradation, wettability and capacity for contaminant removal. The data suggest that organization of NOM plays an important role in its function in the environment, comparable with the role of chemical composition. This approach will provide information for developing new strategies in improving the quality of soils.

Abstract: Nitrogenases are a family of metalloenzymes that catalyze the biological reduction of dinitrogen (N2) to ammonia (NH3), as part of the global nitrogen cycle. There are three, genetically distinct, forms of nitrogenase known: Mo-nitrogenase, V-nitrogenase, and Fe-nitrogenase. They are denoted by the metal atom incorporated into their iron-sulfur cofactor. Mo-nitrogenase is the most common form, with V- and Fe-nitrogenases expressed as secondary or tertiary alternatives. While structurally similar the three forms are not equivalent. They are distinctly different in cofactor content, subunit composition, and specific activities. Understanding the role these differences play in each forms ability to reduce dinitrogen could lead to a greater understanding of the mechanism of biological nitrogen fixation.

Decades of research have developed a significant understanding of Mo-nitrogenase and, in recent years, efforts have been focused towards V-nitrogenase, but Fe-nitrogenase remains largely uncharacterized. We have recently successfully purified the Fe-nitrogenase of Azotobacter vinelandii and begun a kinetic and mechanistic characterization of the enzyme. Utilizing the well characterized Mo-nitrogenase as a reference, we are able to ask very pointed questions aimed at identifying key common features and understanding the role of distinct differences. Here we report on the progress of this work.
Social and Behavioral Sciences - Session I - PAB 114

2:00 pm  Rebecca Harrison, George Jantzen
Dixie State University College of Humanities and Social Sciences

“Pro-choice or Anti-consequence?: A discussion on the role of choice in abortion

Abstract: The pro-abortion movement has adopted slogans and labels involving the word 'choice,' which is not actually representative of their agenda. In this paper I argue that the pro-life movement is more concerned with choice than the pro-choice group. By disregarding the choice, the parents of the unborn child have already made and labeling the results of that decision as the actual choice is to undermine the power that both individuals have the deciding rights over their bodies in the first place. Pro-choice is a misleading term and pro-abortion advocates should more accurately be termed “anti-consequence.” The pro-life group reserves the right to consider other options to a full-term pregnancy after the stage of conception to those who actually did not have that right of control over their bodies such as in cases of rape, incest or endangerment to the mother's life. Recognizing and respecting when an individual actually had a choice and either facing the consequences of that choice, or providing a choice when the opportunity hadn't already been provided, is the reality of what choice really means. In this way, I argue that the pro-life movement agrees with the pro-choice advocates on the rights that a woman should have over her body, and the right the parents should have to choose to have a baby, but recognizes a different timeline for when those choices should occur. To mislabel a consequence as a choice is to mislabel the whole pro-choice group, which should really be termed “anti-consequence.”

2:15 pm  Kerra Henke, Kristine Olson
Dixie State University College of Humanities and Social Sciences

“Modesty or Misogyny? A feminist perspective on modern impediments to career advancement

Abstract: Feminism as a movement has been prominent since the early 1900’s, and has only gained strength through the years. Recent political events have highlighted and allowed a platform for a nationwide discussion of the experiences and professional opportunities of women in the United States. One of the key issues focused on by scholars of women’s studies is the apparent lack of opportunity for professional success for women. Culturally, the “fear-of-success” theory, proposed by Matina Horner is still seen as an explanation for a woman’s lack of motivational drive, though the theory was subsequently discredited. The issue then, is not found in a woman’s fear of occupational success, but in a two-fold reciprocal problem. Women who want to have families are often turned down for managerial jobs and advancements, while women who focus first on career success often have a difficult time finding a spouse and starting a family later in life. The present review of the literature focuses on pay and hiring discrimination, as well as occupational segregation and popular attitudes about women as potential detriments to true equality, noting that the divide is not due to modesty, but to inherent misogyny.

2:30 pm  Lyndsey Craig, Abigail Covington, Dakota D. Witzel, Brittany Bennet, Hollie Roper, Sam Passey, Christine Beers, Craig Demke, Dannelle Larsen-Rife
Dixie State University College of Humanities and Social Sciences

“The Ties that Bind: Attachment Theory in Fifty Shades of Grey

Abstract: The best-selling erotic novel 50 Shades of Grey was widely criticized for glamorizing an abusive relationship. The present paper uses attachment theory to analyze the relationship and behavior of the characters to present an alternative view. Attachment is an adaptive, evolutionary bond that develops
between an infant and caregiver during the first year of life. This relationship serves as the prototype for adult romantic relationships, which have been systematically categorized based on level of avoidance and anxiety: secure, avoidant-dismissive, avoidant-fearful, and preoccupied-anxious. We examined and coded the interpersonal behaviors of the main characters, Anastasia Steele and Christian Grey with each other, their parents, and their other close relationships. Even though Steele gradually becomes involved with Grey, in her first romantic relationship, she avoids intimacy with her friends and family. Alternatively, Grey pursues relationships, forms them quickly, asserts control, and has an intense fear of abandonment. Results suggest Steele's attachment behavior would be categorized as avoidant-dismissive while Grey would be categorized as preoccupied-anxious, which is a common pairing for attachments. The attachment behaviors between avoidant-dismissive and preoccupied-anxious individuals are adaptive, per attachment theory. Explicating the processes of attachment within these characters, and other literature, may increase awareness of, and knowledge about the nature of attachment behaviors in romantic relationships, including abusive relationships. These findings from a wildly popular series may serve as a relevant foundation for prevention and intervention programs in relationship education.

2:45 pm Abigail Covington, Dakota D. Witzel, Lyndsey K. Craig, Craig Demke and Dannelle Larsen-Rife
Dixie State University College of Humanities and Social Sciences

“Bi the Way: A Comparison Study of Sexual Attitudes in Heterosexual and Bisexual Persons”

Abstract: There is a larger population of individuals who identify as bisexual than those who identify as gay or lesbian, yet there is little research on individuals who identify as bisexual. Existing research examines bisexual identity, social judgement, and the consequences of social judgement on individuals, as well as the impact of same sex parents on children. Even though many partner relationships involve sexual activity, some kinds of sexual activity within these relationships are not always viewed as appropriate. There may be differences in sexual attitudes and feelings about sexual behaviors as either appropriate or inappropriate within a personal relationship context; thus, reflecting both healthy and unhealthy sexual attitudes respectively. Little is known about the sexual lives of bisexual individuals. For the purpose of this study, sexual attitudes, practices and feelings, and relationship satisfaction were examined in self-identified heterosexual and bisexual participants. The sexual attitudes scale included subscales on permissiveness (e.g., spontaneity and noncommittal sexual behaviors) and sexual practices (e.g., using protection). It was hypothesized that bisexual people report more permissive attitudes about sex and experience more relationship satisfaction than heterosexual people. In this study examining 1141 individuals were surveyed 87% (N=993) reported as heterosexual and 13% (N=148) reported as bisexual. In regard to gender, 50% (N=569) reported as male, 12% (N=142) reported as female. Ethnicity was reported reflecting that the majority 89% (N=1015) reported as white. There were significant differences in permissive sexual attitudes between heterosexual and bisexual individuals. Bisexuals tended to have more permissive attitudes about sex than did those who were heterosexual, indicating that who were bisexual showed a greater acceptance of noncommittal sexual behaviors. No differences were identified in relationship satisfaction when comparing the two groups. Those who identify as bisexual tend to have more permissive attitudes toward sexual behaviors when compared to those who identify as heterosexual.
Poster Presentations – 3:00 – 4:00pm - Eccles Main Lobby

#101 Michael Bishop, Glen Blakely, Shane Christensen, Heath Papa
Dixie State University College of the Arts

“Finding the light in the rust”

Abstract: The goal of my research is to give viewers a chance to see and interact with a piece of the discarded past. I create mundane objects found in the life of hard working blue collar Americans. The presence of these objects decreases daily and eventually will be forgotten. With countless tests on material I have developed a surface to reflect the elements found in these pieces of history through using unconventional application of iron (at different levels of concentration) paired with various slips and stains. The new surface reflects the deteriorating objects as well as the hard work and values of these people. Along with the glaze surface, the architecture has developed through a combination of thrown and altered pieces assembled with molded objects. The resulting product of this research is a body of work that reflects the past in such a way that the once rejected objects are now brought to light in a postindustrial movement that is my work.

#102 Kerra Henke, Dannelle Larsen-Rife
Dixie State University College of Humanities and Social Sciences

“The Interrelation of Attachment Style and Effective Doctor-Patient Relationships”

Abstract: Attachment research provides a lens and perspective to view, understand, and predict human behavior. This theory focuses on the way in which experiences shape an individual’s view and experience of the world and relationships from infancy through adulthood. Though attachment theory has gained relevance and respect since its conception in 1969, the information provided in this theory has not yet been applied to the medical field in a comprehensive and effective way. Nevertheless, research emphasizes the importance and value found in using attachment as a basis for applied care. Attachment-based care is key to lasting healing and wellbeing. Furthermore, knowledge of attachment styles improves doctor efficacy, patient treatment, and adherence to treatment plans. These positive results are due to the individualized care that attachment-based treatment allows for. Undeniably, attachment awareness promotes health and wellbeing. Based on this information found in the literature, it is proposed that attachment is mandated as part of continuing education programs for doctors who work directly with patients, as the potential for lasting benefits is astronomical.

#103 Peggy Waldvogel, Bryan Jacobs
Dixie State University College of Business and Communication

“Impact on Patient Education, Engagement and Satisfaction Through the Use of Electronic Tablets”

Abstract: Current methods of communication between patients and caregivers involve verbal instructions and generic written documents. Patients who have had major surgery are often unable to remember verbal instructions or understand discharge documents. When a patient is unable to understand and commit to prescribed continued care such as wound care, medication dosage, or physical rehabilitation, the result can mean lower patient satisfaction as well as higher readmission and complication rates. Supplying electronic tablets would provide patients with the ability to access their personal Electronic Health Record (EHR), learn about the medications being administered during their stay, and participate in illness-specific learning modules for post discharge care. The use of an electronic tablet during a hospital stay may improve patient education, engagement, and satisfaction thereby providing patients shared accountability towards their healthcare.
“Synthesizing Your Future”

Abstract: Alternative replacements for dwindling fossil fuel reserves is a vast field of opportunity that has not yet been successfully utilized or maximized. Biofuels produced from microorganisms such as bacteria is one potential source of alternative fuels, however many challenges exist in achieving nonlethal extraction and isolation of the fuels from the aqueous media. As bacteria produce and excrete their hydrocarbon biofuels, they often die from accumulating hydrocarbons on the cell membrane exceeding toxic levels. Ionic liquids (ILs) are promising materials as biphasic extractants to remove accumulating biofuels without harming the bacteria, allowing for continuous extraction methods. Following extraction, the hydrocarbons can be separated from the IL and allow recycling of the ILs for further extractions. We have synthesized several ionic liquids containing nonpolar groups to maximize extraction of hydrocarbons, while incorporating designs that minimize toxicity to bacteria. The extraction solutions can also be separated to recover both the commodity fuel and purified IL material. The successful utilization of ionic liquids that have hydrocarbon extracting capacity and non-toxic cellular activity would introduce a new, cost effective method to yield transportation fuels.

“Kinematic and kinetic comparisons of running in a zero-drop minimalist shoe to running in traditional and maximalist shoes”

Abstract: Lower extremity injuries are commonplace for recreational and competitive runners. During foot strike, runners must absorb the initial shock to the lower extremity, which happens as a result of downward motion of the body after being airborne. Multiple mechanisms have been investigated for reducing this shock, including loading rate during foot strike and landing further forward on the foot. The purpose of this study was to compare several kinematic and kinetic landing parameters for a novel, zero-drop minimalist shoe to three competitors. Thirty runners (15 male, 15 female) ran for three minutes in each of four shoes on a treadmill while wearing retro-reflective markers on the right lower extremities. The last 30 seconds of each treadmill run were captured using a Vicon 3D motion capture system and by high-speed video at 300 fps for foot-strike data. Subjects then ran at the same, self-selected pace across a force platform. Using custom software, force plate and marker data were used with inverse dynamic techniques to calculate the parameters of interest: Loading Rate (LR) and Strike Index (SI). The Altra Zero-drop shoe encouraged a more forwardly located strike index (SI) (up to 64.5% further forward), which has been linked to a reduced LR. Subjects wearing the zero-drop shoe also had a reduced LR by up to 14.6%. No direct correlation between SI and LR was found in this study; therefore, further research is needed to investigate the cause of reduced loading rate while running in the zero-drop shoe.

“The effect of using a drop-step to start the NFL pro-agility test in division I football players”

Abstract: The purpose of this study was to examine the effect of using a drop step (DS) instead of a cross-over step (CS) to begin the NFL pro-agility test. Thirteen division I college football players performed the test using both techniques. High-speed video was used to record all trials at 100 Hz. Body landmark and center of mass information from digitization were used to determine maximum acceleration (aMAX), time to maximum acceleration (tMAX), body angle (θLEAN), time to reach body angle (tθLEAN), and times during the first five yards (t1), the second ten yards (t2), the last five yards (t3), and the total time (tTOT) of the drill. Descriptive statistics (mean +/- SD) were calculated for all variables, and comparisons between
techniques were made using dependent t-tests, with alpha set at (p<0.05). A significant difference between the two techniques was observed at t1 (DS: 1.56 +/- 0.09 s; CS: 1.62 +/- 0.11 s), tTOT (DS: 4.99 +/- 0.35 s; CS: 5.09 +/- 0.35 s), and tAMAX (DS: 0.38 +/- 0.67; CS: 0.46 +/- 0.61). It appears that the DS allowed for a better production of horizontal force. This was likely due to a foot placement that moves the point of application of ground reaction force further behind the body center of mass, and also better muscle stretch, leading to greater muscle force. Overall, the DS appeared to save 0.10s compared to the CS. Coaches should consider its use in training for short bursts of speed and agility.

Abstract: Hitting coaches work constantly to improve player swings, and often differ in opinion about how to do this. Once such difference concerns the axis of rotation for the bat on its way to impact with the ball. Some instructors assert that the bat should rotate about the rear forearm, while others say it should rotate about the trunk. The purpose of this study was to determine which axis of rotation is more dominant, if either, in home run (HR) swings executed by NCAA Division I softball players, and if there are any advantages to either. To do this, 27 HR swings by DI players were analyzed using high speed video (100 Hz) and Direct Linear Transformation (DLT). 3D kinematics were analyzed for every frame from the onset of the swing until ball impact. The angle of the bat to the forearm and to the trunk were measure in each frame. It was then determined which axis was more perpendicular to the bat’s path for each frame. The percentage of each swing for which each axis dominated was calculated. These percentages were correlated to swing parameters to discover potential relationships. No relationships were found between dominant axis and bat speed, swing time, bat acceleration, or ball exit velocity. About 52% of the sample swings utilized a forearm-dominant axis, while the remainder utilized a trunk-dominant one. These results suggest that in the current sample, the dominant axis predicts no measurable outcome, and that there is room for variability in swing style.

Abstract: Baseball hitters are typically evaluated by subjective ratings by coaches and scouts, or on game statistics such as batting average (BA), slugging percentage (SLG), or more recently on-base-plus-slugging (OPS). However, there are few neutral kinematic parameters used to describe swing ability. Bat speed (BS) is thought to predict power hitting, while swings executed in less swing time (ST) are thought to produce more consistent contact. However, neither metric alone has been linked to game outcomes such as BA or SLG in Division I softball players. Instead, bat acceleration (BACC), which is BS/ST, better predicts hits per swing and total bases per swing in those players. Currently, no data exist on the application of BS, ST, or BACC to on-field outcomes for baseball players. The purpose of this study was to establish relationships between swing kinematics and statistical outcomes. Data on 279 swings made during multiple NCAA DII baseball games were collected from video. Through camera setup and calibration, BS, ST, and BACC were calculated for all balls put into play during the games. Swings were sorted by result: outs and hits. For all swings, BS = 35.22 +/- 3.39 m/s; ST = 0.193 +/- 0.040 s; BACC = 188.74 +/- 38.31 m/s2. Bat speed among swings resulting in hits was greater and swing time was less than for those resulting in outs (p = 0.019; p = 0.035). This shows that bat speed produced in short swing times predicts on-field success in this sample.
Abstract: Background: Endometriosis is a female disorder, which causes endometrial tissue to grow outside the uterus. Misplaced endometrial tissue is commonly found in the fallopian tubes and ovaries. During a normal menstrual cycle, the endometrium builds up, sheds, and bleeds. In this abnormal condition, endometrial tissue is located where bleeding cannot escape the body. This leads to a buildup of scar tissue, which causes pain and fertility issues. Although there are theories to what causes endometriosis, science is yet to know what causes this condition. We hypothesize that endometriosis is caused by an enzymatic reaction between two L-form capable bacteria.

Methods: Bacterial growth collected from the bloodstream of 16 individuals were cultured and isolated on BHI agars. Of the 16 individuals, 5 individuals were diagnosed with endometriosis and the other 11 healthy individuals make the control group. An L-form capable bacterium of the genus Microbacterium is present in all 16 individuals being studied. The Microbacterium from these 16 individuals was mixed, on a BHI agar, with other species of bacteria grown from the corresponding individual (Staphylococcal Epidermidis, Micrococcus Luteus, etc.). The mixed bacteria were incubated for 24-48 hours. Observations were then recorded for two weeks.

Results: Mixed bacteria from individuals with endometriosis revealed rare color changes in comparison to the control group. The rare color change produced a majority of purple and a few orange. These color changes were all observed after incubation and before the two-week observation period. Mixed bacterial growth from individuals without endometriosis kept original color as found in its isolated state.

Conclusion: A rare enzymatic reaction between the Microbacterium and other L-form capable bacteria causes endometriosis. The rare appearance of these mixed bacteria, observed after growth, are an indicator of this enzymatic reaction present.

Abstract: The pathogenicity of bacteria is becoming increasingly difficult to treat because antibiotics cannot penetrate bacterial biofilms, an extracellular polymeric substance that serves as a self-defense mechanism. New ionic liquids (ILs), which are organic salts that are liquid at room temperature, are showing promising results in the disturbance of biofilms and ensuing neutralization of the bacteria. The ILs introduce numerous intermolecular interactions that likely fluidize both the biofilm and the bacterial membrane, and in some cases will defeat >99.999% of bacteria in biofilm with a brief 2 hour exposure. The ILs also allow for the delivery of antimicrobials to bacteria embedded in biofilms and have the potential to treat difficult sub-dermal infections. The transdermal permeation ability has been determined for several ILs. To be used in clinical settings, the ILs must also be non-toxic to humans and have appreciable stability for storage and use over long timeframes. ILs have been synthesized using biocompatible cation and anion components. Additionally, natural compounds have been introduced to the ILs in minimal quantities to extend their stability, with the aim to improve shelf-life of the materials and minimize decomposition into potentially toxic by-products. With improved effectiveness against biofilm-protected bacteria and decreased human toxicity, the ILs represent a new class of materials that could be used for broad-spectrum treatment of bacterial infections.
#111 Garett Milton, Wesley Roberts, Kambri Glazier, John Brent Hunt
Dixie State University College of Science and Technology

“Morphological Variance of 16s rRNA Genetically Identical L-form”

Abstract: L-form bacteria have been a topic of debate since their discovery in 1936 by Emma Kleneberger at the Listre Institute in Great Britain. Classically trained Microbiologists have little experience with L-form capable bacteria as their methods are dependent on a stable peptidoglycan cell wall to culture and view. Classic form bacteria are typically morphologically stable as they are limited by cell wall expression. Current scientific dogma states a peptidoglycan cell wall is a must in order to avoid immediate osmotic lysis when exposed to high osmotic pressure. Visual observation has proved this concept to be incorrect. We theorize a series of porin channels and an overexpression of efflux pumps allow L-form to remain stable and thrive under osmotic and antibiotic pressure. With the advance of Soft Cell Biological’s patent pending growth protocol allowing L-form bacteria to become cell wall capable and culture pleomorphic bacteria from blood. The majority of bacteria cultured are much more comfortable thriving without a cell wall, yet are capable of holding a cell wall, Soft Cell through its years of testing has observed many unique qualities regarding L-form capable bacteria, the least of which is extreme morphological differences amongst genetically identical bacteria according to the most conserved and relied upon gene to identify bacteria, the 16s rRNA. 16s rRNA verification has been crucial to elucidation of L-form behaviors. Many samples are mixed pairs closely related, but nevertheless in need of further isolation. Soft Cell team leads have developed strategies to isolate even the most interrelated bacteria while keeping symbionts intact as to study their collective metabolism.

#112 Sarah New, Moditha Eleperuma, Chandlie Stratton, Stephanie Webb
Dixie State University College of Health Sciences

“Bacterial contamination of ground beef”

Abstract: This study focuses on the amount of bacteria present in cooked versus under-cooked ground beef to highlight the importance of proper preparation of meat and to demonstrate the prevalence of bacteria in under-cooked meat. Meat was obtained from two local supermarkets, designated store A and store B, for testing. One portion of meat from each supermarket was cooked to FDA standards of 160 degrees Fahrenheit, another was cooked to 145 degrees Fahrenheit, and the last was left uncooked. Each sample was ground in nutrient broth and plated to Sheep Blood Agar and MacConkey Agar. MacConkey plates are inhibitory to gram-positive bacteria and allow growth of gram-negative bacteria that reside in the gastrointestinal tract and can be linked to food-borne disease. After incubation, bacterial growth was noted on most plates and then gram stained. Both gram-positive and gram-negative bacteria were seen. Fewer colonies were observed on plates from store A compared to store B in three separate experiments. Antibiotic use is a potential factor in the difference in growth between the two stores. To this end, isolated colonies from raw samples from store A and store B were plated for drug susceptibility testing.

#113 Tanner Dockstader, Jie Liu
Dixie State University College of Science and Technology

“Fractals: A Mathematical Art”

Abstract: Fractals are mathematical sets with the property of self-similarity. These sets are created by iterating complex numbers indefinitely. The resulting pattern has great visual as well as practical applications. This project explores the mathematics behind fractals and the many places they appear in nature and how we take advantage of its unusual geometry.
#114  Annie Bowles, Lisa McPherson, Eric Kool, Jim Ford
Dixie State University College of Science and Technology, Stanford University

“Preliminary Assessment of ARGO Probe Performance and MTH1 Activity Levels in Tumor Tissues”

Abstract: The ATP-linked guanine-oxidized (ARGO) probe is a two-headed dinucleotide that may allow for sensitive measurements of MTH1 activity. In tumor cells, the MTH1 enzyme is expressed to reduce the number of oxidized nucleotides. Normal cells maintain low levels of oxidized nucleotides and do not require MTH1 to function, whereas these levels are elevated in tumor cells. Therefore, tumor cells rely heavily on MTH1. In this experiment, we intended to determine the optimal protein concentration from tissue samples required to visualize MTH1 activity using the ARGO probe. ATP-depleted lysates were made from one matched control/tumor tissue sample. Two reactions were prepared for each lysate: one with and one without (S)-crizotinib, a known MTH1 inhibitor. The ARGO probe along with a fluorescent reporter was added to each tissue lysate, and fluorescence was recorded. The fluorescent signals were observed to have a significant difference in MTH1 activity between tumor and non-tumor tissue lysates, indicating the ARGO probe can be used to accurately measure MTH1 activity in vitro. This experiment is the first measurement of the enzymatic activity levels of MTH1. This method can be used in the future to evaluate therapies that are developed to target MTH1.

#115  Andrew Arslanian, Wendy Schatzberg
Dixie State University College of Science and Technology

“Investigation of charcoal-based electrically conductive paint”

Abstract: “Do-it-yourself” (DIY) formulations of commercial conductive ink or paint are becoming more popular due to online tutorials through YouTube, Instructables.com, etc. Conductive paints have been featured in journals such as Progress in Organic Coatings (Yedra et al., 2016) and Journal of Electronic Materials (Leong, Chia-Ken, & Chung, 2006). One anecdotal conductive paint application, using charcoal as the conductive substrate, was investigated to determine the resistivity constant ($\rho$) at various concentrations of substrate and other materials. Attempts to optimize the conductivity were also performed by varying material concentrations. Analytical methods were employed to formulate the paint samples, collect the data, and interpret it.

#116  Gift O. Ifijeh, Chinye S. Nwokolo, Rico E. Del Sesto
Dixie State University College of Science and Technology

“Low Toxicity Extraction Solvents for Recovery of Precious Materials and Environmental Contaminants”

Abstract: One major challenge to our growing society is the extraction of both contaminants and market-value chemicals from water and waste systems. As water becomes a more precious commodity, new methods that clean water and recover precious compounds without wasting further water resources is critical. Ionic liquids, which are hydrophobic organic salts existing as liquids at room temperature, are tunable organic materials comprised of cations and anions that can be optimized for water immiscibility and extraction efficiency. Ionic liquid extractions can serve as an environmentally friendly method of extraction of compounds from water, including biofuels and rare earth metals as commodity chemicals, or heavy metals and organic compounds that are toxic.

This study focuses on ionic liquids containing phosphonium cations for broad-spectrum extraction of chemicals from water, due to their ability to form separate phases with water allowing for biphasic extraction. The ionic liquids were tested for extraction efficiency of several classes of compounds, including lanthanide and actinide metals, can easily pollute biological systems and cause adverse effects. These metals have market value as precious metals, but can also be toxic due to radioactivity and heavy metal
poisoning. The ionic liquids were also determined to extract large organic compounds, such as biofuels produced by bacteria in water systems, to address alternative solutions to energy production. As these materials would potentially be used in the extraction from environmental samples, the toxicity of the ionic liquid compounds was assessed on several species of bacteria using zone of inhibition tests. Ionic liquids present as a new approach to broad spectrum extraction processes, including restoration of environmental systems to their standard environment through the extraction of harmful metals or organics, and to allow recovery of commodity materials.

#117 Addison Everett, Jace Melessa, TaylorAnn Christensen, Darren Stapleton, Rico Del Sesto
Dixie State University College of Science and Technology

“Ionic Liquids: Green Extractants of Biofuels”

Abstract: Alternative sources of fuel is a vast field of opportunity that has not yet been successfully utilized or maximized. One reason for this is that organisms such as algae and bacteria that are used for the production of biofuels often die as a result of accumulating hydrocarbons on the cell membrane. The solution to this problem could lie in the use of ionic liquids (ILs), which could serve as a way to collect the hydrocarbons being produced without disturbing the cells, and in turn also provide a protecting agent for the organism producing the fuels. Hydrocarbon-based biofuels produced by bacterial cells in an aqueous solution can be extracted with water-immiscible ionic liquids. The ionic liquid-biofuel mixture is separated from the cell-containing aqueous solution for isolation of the hydrocarbons. The ionic liquids themselves are “green” in that they are recycled, mostly due to the fact the structure of the IL is unchanged following extraction. The ionic liquids are optimized to be non-toxic to the biofuel-producing organisms, and to maximize their solvation properties of hydrocarbons. The main structural properties contained within these new ionic liquids include organic cations to increase water-immiscibility, and hydrophobic anions to improve hydrocarbon solubility. The successful production of ionic liquids that have hydrocarbon carrying capacity and non-toxic cellular activity would be a breakthrough in the cost effectiveness of producing biofuels.

#118 Christopher Zdunich, Joseph LaFontaine, Gabriela Chilom
Dixie State University College of Science and Technology

“Investigating the Structure of Humic Acid using a Molecular Probe”

Abstract: Humic acid is one of the major components of organic matter in soil and plays an important role in the transport and fate of environmental contaminants. Its role is attributed to its bulk chemical characteristics as well as to its structural organization. The architecture of humic acid is investigated through the use of deuterated palmitic acid as a molecular probe. The palmitic acid is deuterium-marked on all carbohydrate chain hydrogens (CD3-C2-H-C2H-COOH). Preliminary data suggests the occurrence of a phase transition in the fatty acid from the solid phase to a liquid-ordered phase upon interaction with humic acid. To more systematically account for changes in the phase of the palmitic acid, a method was developed and tested using model compounds. A solution of a synthetic surfactant (sodium laurel sulfate) above the critical micellar concentration was mixed with a protein solution of 1M β-lactoglobulin. The resulting mixture was allowed to interact with a film of palmitic acid. The complexes formed in this process were analyzed by IR spectroscopy and the shape and location of the absorbance bands compared to those of pure deuterated palmitic acid.
Rhianna Wolsleger, Oscar Ruiz, Gabriela Chilom
Dixie State University College of Science and Technology

“Effect of humic acid treatment on the removal of methylene blue from aqueous solution”

Abstract: Effect of humic acid treatment on the removal of methylene blue from aqueous solution
Industrialization has become a major source of water contamination, with industries such as textile and pharmaceutical depositing harmful dyes into water, affecting large portions of marine and plant life. Recent efforts are focusing on developing new decontamination methods that use natural materials. Humic acids are among the naturally occurring materials capable of removing dyes from contaminated water. In this study, humic acid samples isolated from peat and leonardite materials, before and after organic solvent extraction, were used to remove methylene blue from aqueous solution. Batch sorption experiments were conducted at pH = 3.3 at room temperature and the concentration of the methylene blue in solution was determined by UV-Vis spectrometry. Data shows significant differences between treated and untreated humic samples in terms of decontamination capacity and their sorption isotherm mechanisms. These differences cannot be explained just by the changes in the bulk chemical characteristics of the humic acid upon treatment, but are attributed to the presence of new sites in the treated humic acid, sites that were previously unavailable to the methylene blue.

McKenzie Goold, Jefferson Last, Martina Gaspari
Dixie State University College of Science and Technology

“A Study of Dyskeratosis Congenita and Cartilage-Hair Hypoplasia”

Abstract: Diseases like dyskeratosis congenita (DKC) and cartilage-hair hypoplasia (CHH) are caused by mutations that result in a downregulation in human telomerase RNA component (hTR) or mitochondrial ribonucleoprotein RNA subunit (hMRP). hTR is the RNA building block of telomerase, a ribonucleoprotein that counteracts the end replication problem by replacing the DNA lost at the end of chromosomes. hMRP is the RNA component of mitochondrial ribonucleoprotein and is found in several locations in the cell, including the nucleus. It functions to process 5.8S rRNAs and cyclin B2 (CLB2) mRNA, regulating the completion of mitosis. It has previously been demonstrated, through siRNA experiments, that causing a downregulation of hMRP in HeLa cells, results in a downregulation of hTR as well. It was also shown that pulling down hMRP levels in HeLa cells detects hTR. We propose a physical interaction and functional relationship between hMRP and hTR. We performed a set of experiments to study this interaction. First, we ran a Northern blot to detect if the expression levels of hMRP and hTR were similar in both VA13 cells, epithelial lung cells, and HeLa cells, human cervical carcinoma cells. Because of the interaction between the two components, we expected HeLa cells, which have high expression levels of hTR, to also have a high expression level of hMRP, and VA13 cells, which have a low expression level of hTR, to have a low expression of hMRP as well. We plan to further study this interaction by transfecting DKC and CHH patient cell lines with engineered hMRP and hTR to observe if we can rescue the low expression of the endogenous RNAs. To confirm that our expression vectors were functional, we had to successfully transfect an hTR mammalian expression vector into VA13 cells and an hMRP mammalian expression vector into HeLa cells. Northern blotting and RT-PCR confirmed overexpression of hTR and hMRP in VA13 and HeLa human cell lines.
Brayden Chamberlain, Marius Van der Merwe
Dixie State University College of Science and Technology

“Rodent Mark and Recapture Survey - Pakoon Springs”

Abstract: Rodent populations in the Pakoon Springs area of the Parashant National Monument were surveyed and estimated using the Lincoln-Petersen capture-mark-recapture method. We took two surveys, one in the spring and one in the fall. It was found that there was a large variance in the species ratio between the two surveys. After comparison of environmental factors, we determined that variance is due to one or a combination of the following: temporary/seasonal reduction of activity in some species, or permanent out-competition by one species over the other. Additional surveys would be required to identify the actual cause for the change in species ratio.

James Barrett, Gabriela Chilom
Dixie State University College of Science and Technology

“Adsorption of Water Vapor on Soil Samples: Effect of Treatment and Depth”

Abstract: Adsorption of water vapor occurs in soils, and is crucial for plant development, especially in arid regions as well as in dry periods of tropical soils. The proper use of adsorption data can improve agricultural water management, ecological studies, surface energy balance studies, and remote sensing investigations. Soil properties such as composition and origin affect the sorption of water vapor. This study is looking into the effect that agricultural treatment and location of soils has on the water vapor sorption. The process was quantified by measuring adsorption isotherms of soil samples collected from three various depths (0-6”, 6-12”, 12-24”) after various crop rotations (soybean, corn, oats, and peas). The adsorption isotherms were measured with “desiccator method” using saturated salt solutions as humidity standards. The surface area of the samples was estimated from the isotherms using the Brunauer Emmett Teller (BET) equation. Data showed that the agricultural treatment had a greater impact on the sorption of water vapor on soil samples than the location of these samples.

Song Gao, Andrea Brown
Institutional Research

“DSU Enrollment Prediction Model”

Abstract: Educational leaders are calling for use of systematic planning. The effective implementation of such a procedure requires the accuracy of student enrollment prediction. We used DSU financial aid information to develop a regression prediction model to forecast DSU annual fall enrollment.
Oral Presentations – 4:00 – 5:00pm

Communications - Session II - ECC 155

4:00 pm  Milton Williams, Jennifer Kohler, Ashley Synder, Spencer Ricks, Madison Bidinger, Even Gonzalez, Jaimes Geren, Candance Schetter, Josh Jenks
Dixie State University College of Business and Communication

“Tall Walls and Good Neighbors: Media Bias on Trumps Border Wall”

Abstract: In Robert Frost’s poem "Mending Wall" he said, “Before I built a wall I’d ask to know/ What I was walling in or walling out”. This quote can be directly applied to the controversy surrounding the idea of building a wall along the US/ Mexico border. This has become the age of too much information and not enough knowledge largely due to the saturation of the media. Our research project is meant to illuminate mass media bias, both for and against building President Trump’s wall. It seems the media is no longer meant to inform, rather, it is to pander to a certain audience. Through careful analysis of different media mediums using Aristotle’s rhetorical triangle, we examined the eight different types of mass media bias and how they have impacted America’s perception of the implications of building a wall. While the results of the study do prove that media bias exists, it hints at a larger problem in American society: Mass media is the only link between the public and the government, and it has become difficult for American’s to make an informed decision without opinions being tainted. What are we walling in or walling out? And why have we grown to expect media bias in our everyday life? With the political divide growing larger every day, society needs to understand the overreaching impact that media plays in shaping our perception of reality.

4:15 pm  Patrick Lynch, Olga Pilkington
Dixie State University College of Humanities and Social Sciences

“A Refutation of the Deleterious Effects of Texting on Language: Synchronic Tilting at Orthographic Homogeneity”

Abstract: Through the ages, language has given complex abstract ideas a tangible medium for communication and identity formation. Modern society utilizes language to orchestrate and refine almost every aspect of life. Popular media reports have made tacit claims that the innovation of texting causes language change. The high levels of deviation from language homogeneity provide for potential concerns about literacy, reading comprehension and formal writing skills in language learners. The phenomena of texting’s deviance is one locus that evades thorough academic examination. The auspicious transformation that text messaging poses demands an analytical review of the linguistic tenants related to wholesale language change. Texting’s sudden onset and age specific dissemination highlight the formality with which the phenomena should be studied. I will show, through an academic literature review, that texting allows users to maintain fidelity to the phonological orthography, while providing for unique styles of expression that constitute morphological changes.

4:30 pm  Candy Roland, Erin Ortiz
Dixie State University College of Business and Communication

“The growing phenomenon of fake news beyond satire”

Abstract: Fake news has been known, defined and researched in the context of satire. However, a growing trend is the production, consumption and distribution of fake news in the form of actual malice. In fact, Pulitzer Prize winner and political debunking website PolitiFact.com awarded its 8th annual “Lie of the Year” to the fake news phenomenon for 2016. This form of fake news is typically written by non-professionals, who pursue agendas or exploit internet culture for payment. Even though noxious fake news, like satirical fake news, is fictional and made with or without the intent of harm, it can have consequences that impact real life. Using the social media research databases of CrowdTangle (for Facebook) and Discover Text (for Twitter), this study will be a content analysis of noxious fake news.
**Humanities - Session II - PAB 124**

4:00 pm  
Michael Nielsen, Hosok O, Jeremy Young  
Dixie State University College of Humanities and Social Sciences


Abstract: This research paper, originating from an upper-division American history course, presents a careful analysis of points I, II, V, X, and XIII in Woodrow Wilson's Fourteen Points declaration. The theoretical and moral aims of Wilson's policy are measured against its actual results to manifest the faulty and unworkable nature of the policy. This paper's primary focus is on the cynical post-war attitudes of Wilson's wartime allies, namely, the United Kingdom, France, Italy, and Japan, to the peace document's proposals and the inherent idealism built into them. The mixed responses of Americans such as Protestant Christians and Theodore Roosevelt to many of Wilson's Fourteen Points and the crown of the plan, the League of Nations, are also considered. The paper argues that Wilson did not fully understand the motivations and interests that drove the United Kingdom, France, and Italy in post-war Europe, that the swelling interests of Japan in East Asia were wholly foreign to Wilson's Westernized political ideas, and that Wilson did not accept the naturally limited domain of his power and authority over world affairs. He could not control international conduct through his self-righteous diplomacy. His simplistic and progressive faith in applying his abstract concepts of moral governance met immensely problematic issues in the face of worldwide political and moral brutishness. This paper concludes that as he was ideologically dedicated to imposing his moral visions abroad, Wilson’s utter stubbornness to bow to political realities illustrates his ignorance of the vastly complex conditions of global politics.

4:15 pm  
Kayla Vowel, Jeremy Young  
Dixie State University College of Humanities and Social Sciences

“Emergence of Modern Food”

Abstract: In the united states, the subject of food has become increasingly important today. Despite food’s immense popularity, this deceptively simple topic and its centrality in our everyday lives can easily be overestimated and even taken for granted. To fully understand and appreciate our complex relationship with food today, it is important to examine the origins that have shaped the landscape of food in America. The question surrounding this research is what specific movements helped shaped and develop America’s modern food system? Because the turn of the century was a crucial era in which food dramatically changed, this paper examines the American developments after the industrial revolution and determines key factors and motivations in the late 19th century and early 20th century that helped shape the modernization of America’s food industry. The research methods in this paper include a strong emphasis on the main historiographical pieces in American food and nutrition history along with key primary source documents, such as Progressive Era cookbooks and literature. This paper concludes that the origins of America’s modern food system are imbedded in the political, social, and economic movements during the turn of the century. Thus, capitalization and commercialization of food with the emergence of big food corporations, the nutrition revolution and popularization of food science, and the age of Progressive food reform were all important events that lead to the modernization of America’s food system and systematically changed the way Americans produce, buy, and eat food.

4:30 pm  
Travis Leon Ridd, Joy McMurrin  
Dixie State University College of Humanities and Social Sciences

“The Rhetoric of Food Writing in Recipes”

Abstract: Recipes are often essential to making complicated dishes. The dishes that a cook creates are preserved by recipes for future replication. Some recipes, however, are not written effectively for this purpose. This research evaluates the rhetoric of recipes and how a recipe’s strength is weakened by vague words and inaccurate content.
The research contained includes 20 recipes that are evaluated based on the clarity of word choice and the presentation of the material. The major question that will be answered is what elements give a recipe utility and strong rhetoric.

Lynn Z. Bloom wrote about the organization of recipes in the College English article “Consuming Prose: The Delectable Rhetoric of Food Writing.” The article states that however complex an instruction is, “it must be a pleasure to follow.” The statement shows how usability is of secondary importance to the “food writer” that is the fictional hero of Bloom’s essay.

Bloom uses a lot of phrases about the type of language that appeals to readers that establish the extreme of food writing in which the act of cooking and practical instruction are not important. The influence of the food writing field sways the way that published recipes are written, often reducing the chance a home cook would have of reproducing a recipe accurately. This research evaluates features of published recipes that are rhetoric carried over from creative food publications.

4:45 pm  Jeremy C. Young
Dixie State University College of Humanities and Social Sciences

“The Experiential Turn in American History”

Abstract: In his 1981 American Historical Association presidential address, Bernard Bailyn identified “an intensifying effort to relate the world of interior, subjective experiences to the course of external events” as one of the major emerging trends in historiography. During the ensuing three decades, a variety of historians – most recently Lynn Hunt in Writing History in the Global Era (2014) – have called for increased scholarly focus on how ordinary people perceive historical events and how those perceptions condition historical change. This paper argues that a broad “experiential turn” has in fact already occurred, and is continuing to develop, within the historical profession. Taking the subfield of American history as a case study, the paper surveys a series of new historical approaches historians have pursued since 1981: “emotionology” and the history of emotions, the history of religious experience, work influenced by affect theory and cultural theory, work that incorporates psychological and neuroscientific insights, and newer work in the history of American capitalism and culture. Although these historiographical developments are generally considered separately from one another, when taken together they reveal a broad effort among American historians to explore and understand the history of experience. The paper concludes with two observations: first, developments in digital methodology have opened new and promising avenues for the study of experience. Second, the divide between historians who study experience for its own sake and those who seek to understand how experience shapes traditional categories of historical analysis remains as significant as when Bailyn first described it.
Natural and Physical Sciences - Session III - PAB 117

4:00 pm Jesse Hicks
Dixie State University College of Science and Technology

“Classification of Spacetimes”

Abstract: Spacetimes with symmetry play a critical role in Einstein's Theory of General Relativity. Missing from the literature is a correct, usable, and computer accessible classification of such spacetimes. This dissertation fills this gap; specifically, we,

i) give a new and different approach to the classification of spacetimes with symmetry using modern methods and tools such as the Schmidt method and computer algebra systems, resulting in ninety-two spacetimes;

ii) create digital databases of the classification for easy access and use for researchers;

iii) create software to classify any spacetime metric with symmetry against the new database;

iv) compare results of our classification with those of Petrov and find that Petrov missed six cases and incorrectly normalized a significant number of metrics;


4:15 pm Brant A. Ross, Nelson Woo, Zachery Smith
Owner, MotionPort

“Physics-Based Simulation of the Deployment of Space Structures”

Abstract: There are many benefits derived from simulating the nonlinear dynamics of stowing, deploying, and utilization of deployable space structures; including saving time and money, but most importantly, improving safety and reliability. The importance of simulation is even higher given the profound limitations of physical testing. Dynamic simulation mitigates the risk of developing new deployable space structures, including solar arrays, by predicting transient motions and loads during stowage, deployment, and mission-related maneuvers. Simulation increases the agility of the design process for deployable structures in orbital, lunar surface, Martian surface, and other environments. Dynamic simulation can also be used to assess the efficacy of using motion control to lessen the effect of accelerations on the response of the space structure. This capability is critical in reducing the weight of the deployable structures while achieving stiffness requirements (minimum primary natural frequency).

MotionPort, a small business in St George, has conducted two Phase I SBIR research projects for NASA, with the presenter as the principal investigator. A variety of successful simulations have been done and tools have been developed to make the model created process more approachable and efficient for NASA engineers. The presentation will review what has been accomplished and what has been proposed as a potential Phase II project. The goal is to develop a vertical software application that can be applied to the simulation of small (CubeSat), large, and very large split-tube solar arrays, roll-up solar arrays, fold-out solar arrays, antennas, and boom systems.
4:30 pm  Michael R Dahlby  
MetaShield LLC  

“Applications of nanotechnology for advanced functional coatings.”

Abstract: MetaShield LLC is a nanotech startup company founded by Bill Bickmore (St. George, UT) and Martin Ben-Dayan (New York, NY) that specializes in innovative silica-based coatings. In this presentation, I will introduce the company, give a brief overview of this technology, and illustrate its potential for synthesizing a diversity of materials. I will conclude by highlighting the areas in which MetaShield is driving innovation, including improving the impact resistance of glass, manipulating light to increase solar cell efficiency, and protecting sensitive materials against harmful ultraviolet radiation.

4:45 pm  Shirlayne Quayle, Jared Goodspeed  
USTAR  

“USTAR: The Utah Science Technology and Research initiative”

Abstract: An overview of USTAR programs and opportunities in southern Utah
Natural and Physical Sciences - Session IV - PAB 119

4:00 pm  Gerald Bryant, Ulrich Wortmann, Emma Hale
Dixie State University College of Science and Technology

“A Possible Mars Analog in the Navajo Sandstone”

Abstract: Recent images from the Mars rover Curiosity indicate the presence of fluid escape pipes within a sedimentary succession that includes eolian sediments. These fluidization features add to the accumulating evidence of aqueous activity during the sedimentary history of the planet and suggest both the presence of shallow water tables and regional seismicity, impact activity, or some other fluidizing process at the time of pipe formation. Modern Earth analogs to the features in Gale Crater are abundant; however, subsurface components of the fluidization complex producing these features may not be well represented in modern Earth environments. Fortunately, a much broader range of liquefaction/fluidization features appears in the ancient eolian record exposed on the Colorado Plateau of the southwestern United States.

Within the regional pipe-bearing succession, the Navajo Sandstone provides particularly useful examples, linking fluid-escape pipes to much larger-scale processes and an array of deformation features. Among the larger-scale examples, a complex located in Kanab Canyon is notable for providing a complete cross-sectional view, which displays a central zone of intense deformation that gradually attenuates in all directions. Convoluted bedding and abrupt shears define multiple zones of sediment displacement with diverse orientations. At that location, preserved primary structures also support the reconstruction of original bedding geometries, and cross-cutting surfaces establish a relative chronology between erosional/depositional processes and the deformation event. These characteristics of the Kanab Canyon study site make it an ideal case study for researchers preparing to interpret sedimentary successions on Mars that have been subject to liquefaction/fluidization processes.

4:15 pm  David R. Black, Ana Vargo, USDA NRSC, David Simon, Simon Associates LLC, Todd Sieber, USDA NRCS
Dixie State University College of Science and Technology

“A Case Study of a Craked Dam, Frog Hollow Debris Basin, Washington County, Utah”

Abstract: Frog Hollow Debris Dam is approximately 2.5 miles south of Hurricane, Utah on the Uinkaret Plateau and is founded on Quaternary-age basalt flows. The original dam was constructed in 1956 at a height of 30± feet and length of 600± feet. In 1978, the dam was raised 16± feet and the length increased to 1,900± feet, under the USDA Small Watersheds Program. The dam has no permanent storage, and is classified by NRCS as a high hazard dam. In the next few years, proceeding construction, cracks were observed in the embankment and grouting proved ineffective. A fix in 1983 removed two feet of embankment and installed a sand filled chimney drain. During the 2015 inspection new holes and cracks were observed. A 2015 geotechnical/geologic investigations documented 51 holes in the embankment, transverse cracking, and a 100-foot long longitudinal crack about 35 feet upstream of the centerline. The cracking and holes appear to be due to desiccation of the gypsiferous, clayey, alluvial 1976 embankment fill. The 2015/2016 geotechnical/geologic subsurface investigations determined: a) transverse cracking upstream, downstream, and thru the chimney drain; b) cracking confined to the 1976 embankment material, not extending into 1956 embankment fill or underlying basalt foundation, and; c) cracks range from hairline fractures to 5 inches wide, narrowing with depth. The use of fluorescein, a diagnostic dye tracer, was very effective in evaluating the vertical and lateral dimensions of the cracks. Temporary repairs to the dam will occur in 2017 and dam rehabilitation in circa 2020.
Abstract: The Canyon Overlook Trail of Zion National Park follows an outcrop of Navajo Sandstone, which displays a uniquely well-exposed assemblage of features associated with failure of the lee face of a large eolian dune, and run-out over an expanse of interdune sediments downwind of that bedform. Exposed features include dramatic folds in the interdune succession and a stacked series of thrust sheets. Thrust surfaces display consistent strikes, parallel to those of undeformed foresets, and incorporate zones of brittle failure and fluid deformation, including folds overturned in the direction of foreset dip. These features correspond to predictions made by the Horowitz (1982) model of dune collapse, formulated from less fortuitously exposed architectures in the Navajo Sandstone. Unlike the Horowitz (1982) model, however, this site preserves distinct indications that the bulk of deformed material accumulated above the level of the contemporary interdune surface, in an aggradational succession.

Paleotopographic reconstruction indicates the presence of a large dune, partially encroached upon a wet interdune. The interdune deposit is two carbonate mud layers, separated by medium-grained sand. Trapping of pore water pressure between these mud layers during liquefaction reduced shear strength in the sand interval, facilitating the collapse of the lee face of the upwind dune into the interdune area, and transmitted resultant shear forces to distal portions of the interdune expanse, in the shallow subsurface. Upturned mud layers in the toe of the slump resisted deflation, promoting preservation of an irregular interdune topography, over which the reorganized dune ultimately advanced.
Abstract: An extinction retention deficit is a key fear memory abnormality associated with Post-Traumatic Stress Disorder (PTSD). New evidence strongly suggests that this reflects an impairment in ability to utilize contextual information rather than a failure to read safety signals. We used an animal model of PTSD - single prolonged stress (SPS) – in which extinction recall deficits are also observed, to further examine this phenomenon.

Methods: Male Sprague-Dawley rats (n=128) were exposed to SPS or a control procedure in 4 fear conditioning, extinction and extinction retention experiments. We varied the timing of SPS and the extinction retention context to determine whether SPS impacted extinction retention via effects on extinction retrieval/consolidation, fear consolidation, and/or contextual modulation of extinction retrieval.

Results: We replicated SPS-induced extinction retention deficits [SPS vs controls: F(1,28)=29.46, p<.0001], and demonstrated that fear and extinction memories acquired before SPS are not impacted by it [exps 2&3 control vs SPS: NS]. Using a novel context for extinction retention testing enhanced fear recovery in control animals, but had no effect on SPS animals [SPS vs controls: F(1,14)=6.36, p=.024 and F(1,14)=.025, p=.87 respectively].

Conclusions: SPS must occur prior to fear acquisition to produce a PTSD-like extinction retention deficit. Animals with this deficit fail to utilize contextual information to modulate fear during extinction retention testing. This finding – that impaired contextual processing may underlie SPS-induced extinction recall deficits – echoes a recent human PTSD study, suggesting that contextual modulation of fear may be a core memory process that is disrupted in PTSD.

Abstract: Job preferences and benefits are important components of selecting a career. This study evaluated STEM graduate student job preferences and benefit differences based on gender. Hypothesis 1 (H1) predicted that men would enact a traditional “breadwinner” gender role when considering career benefits and preferences. Hypothesis 2 (H2) predicted that women would enact a “nurturing and caretaking” role when considering career benefits and preferences. Hypothesis 3 (H3) predicted that women would be more interested in diverse communities and campus benefits such as childcare and fitness centers than men. A total of N = 1188 participants (56% women, 44% men) completed an online survey for this study. Participants were asked to rate statements about preferences and benefits when considering a job and its location. Participants were also asked about expectations in receiving compensation for moving, salary, and conference travel expenses. The results of the study indicated that men endorsed the breadwinner gender role in valuing higher monetary compensation for moving and conference travel expenses, but not for salary in comparison to women (H1). The results supported H2 that women valued insurance and health benefits significantly more than men. H3 was supported in regard to women’s preference over men for community diversity and campus benefits such as childcare and fitness centers. Therefore, universities should advertise community diversity, childcare, healthcare, and campus benefits in order to recruit women into STEM related careers.
Abstract: Play is essential to growth and development across the lifespan as it benefits mental and physical health. Throughout nature, play behavior is observed among animals and humans as a necessity for survival and development. Although play has been associated with optimism, curiosity, progressive mastery, self-regulation, imaginative problem-solving, and increased perseverance, play deprivation is increasingly common in the United States. The present study is a review of the literature on the effects of play deprivation. Research suggests that play deprivation is correlated with higher crime rates, and incarceration. More specifically, research suggests murderers and other serious criminals were deprived of play in their early childhood. Thus, play is essential and necessary to growth, development, and overall well-being. Without play the outcomes can be negative and unhealthy. Play deprivation is an issue that must be addressed to create better opportunities for play that is essential for survival and development across the lifespan. An online survey posted on survey monkey was used to question participants about play in their childhood along with questions about access to play, and questions to explore their home environments. Questions of the survey came from previously tested measures such as Adverse Childhood Experience (ACE) measures, The Children's Leisure Activities Study Survey (CLASS), Preschool-aged Children's Physical Activity Questionnaire, Behavioral Affect Rating Scale (BARS), Conflict Tactics Scales (CTS) to test how much they played as children and their home environments.
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