26th Annual Research Symposium

Oklahoma State University
Stillwater, Oklahoma
February 18-20, 2015

Poster ABSTRACT BOOK

1 | 2015 Research Symposium Poster Presentation Abstracts

gradcollege.okstate.edu/researchsymposium

2015 Research Symposium
Shrinkage Induced Deformations In Steel Bridges Made Composite With Concrete Deck Slabs

Ibrahim AbdelMeguid, Kendall Belcher, Bruce Russell
Oklahoma State University
School of Civil and Environmental Engineering
Subject Area: Physical Sciences Technology

Concrete decks cast on steel bridge girders experience volume changes beginning after taking initial set. Volume changes result from temperature changes, creep or drying shrinkage of concrete. Shrinkage of the concrete occurs from a combination of hydration and evaporation as water is consumed or pulled from the concrete. Some Oklahoma bridges have been rehabilitated by casting new concrete decks atop the existing steel girders. Some of these bridges experienced excessive downward deflections at mid-spans after construction was completed. Our research shows that concrete strains caused by drying shrinkage may account for some of these mid-span deflections.

Prototype beams were constructed from steel girders made composite with concrete deck slabs. These beams were monitored for temperature, concrete and steel strains and deflections. Results of the prototypes show downward deflections and concrete compressive strains consistent with the phenomenon of concrete shrinkage. Test results are compared to analytical iterative models that focus on concrete shrinkage and temperature variations, concrete properties were tested in the laboratory to use them in the models, and forensic investigations were done on the bridges that show the bridges were in a good condition and shrinkage may not be the cause of the excessive deflections causing the bad ride.

Improving the Stability of Chitosan-Gelatin Based Injectable Hydrogel for Cardiac Regeneration Therapy

Carol Abraham, Christian J. Tormos, Sundararajan V. Madihally
Oklahoma State University
School of Chemical Engineering
Subject Area: Biomedical Sciences

To combat cardiovascular disease, a treatment option is to develop a cardiac patch delivering stem cells using injectable hydrogels to regenerate tissue. In tissue regeneration, cells are cultured on various biomaterials that are used as scaffolds. Naturally derived polymers such as gelatin have seen significant interest due to their ability to influence cellular functions and biocompatibility. Thus, gelatin-containing chitosan hydrogels were prepared to ensure cell adhesion. However, when cells were cultured on gelatin, they secrete increased amounts of matrix degrading proteases. Clinical trials show significant attrition of injected cells due to the stability of the hydrogel and lack of nutrients. To prevent this, doxycycline (DOX) protease inhibitor was encapsulated in PLGA nanoparticles (NPs) immobilized in the matrix, and release kinetics were determined. Also, gelatin was chemically cross-linked using transglutaminase (TG). Presence of TG and DOX NPs in the hydrogel improved stability of the hydrogels and increased cell retention by 250%. This incorporation allowed all cells retained and lost to be accounted for by the data.

Evaluation of the Promotion of Free School Breakfast on Consumption and Perceptions of School Breakfast in Stillwater Public Schools

Lauren Amaya, Gail Gates
Oklahoma State University
Department of Nutritional Sciences
Subject Area: Social Sciences

Research has shown that children who consume breakfast at school experience benefits such as lower rates of obesity compared to children who do not consume school breakfast. Barriers to participation in the School Breakfast Program (SBP) include cost, lack of time, and stigmas associated with the program. The objectives of this study were to determine changes in parent and student perceptions of SBP and differences
in breakfast consumption throughout the year after implementation of universal free breakfast and a small intervention in Stillwater Public Schools. Convenience sampling was used to measure perceptions of SBP among children and parents using an online survey and plate wastes were conducted in three schools at baseline, midpoint and conclusion of the study. Chi square analyses indicated that overall, perceptions of school breakfast changed significantly over the study period with lower perceptions seen at conclusion compared to baseline for parents (n=988), and no significant differences for children (n=797). ANOVA showed no differences by month for selection and consumption of most nutrients, although there were significant differences in average percent of meals consumed by breakfast location (p<0.001). By increasing opinions of SBP and promoting consumption of healthy meals, children’s nutrition and school performance may improve.

**Pro-angiogenic/atherogenic effect of hyperosmolarity in endothelial cells is reversed by hydrogen sulfide treatment**

**Kelsey Anderson**  
Oklahoma State University  
Physiology  
Subject Area: Biomedical Sciences

Diabetes is a risk factor for atherosclerosis, a narrowing and hardening of blood vessels due to the formation of fatty plaques in the vessel wall. Placental growth factor (PLGF), a cytokine affecting multiple tissues, contributes to the early progression of this disease by driving inflammatory cell infiltrates and vascularization of plaques. Hydrogen sulfide (H₂S), a gas endogenously produced by blood vessels, has recently been shown to exert cardio-protective properties. Therefore, we hypothesized that chronic hyperglycemia would increase the secretion of PLGF by endothelial cells (EC) and that treatment with exogenous H₂S would reverse the effect on PLGF secretion. We continuously exposed human EC to high glucose (25mM), mannitol (20mM), or normal glucose (5mM) for three days. Next, EC were treated with 0, 50, 100, 150, and 200 μM of sodium sulfide (which liberates H₂S) for 6 hours. Media was collected to quantitate secretion of PLGF. We found that EC exposed to a hyperosmotic environment substantially increased the secretion of PLGF relative to cells exposed to normal osmotic conditions. Treatment with 100 μM or 150 μM sodium sulfide (NaHS) reversed the effect of hyperosmolarity on PLGF secretion. Likewise, treatment of control EC to NaHS exhibited a minor reduction in basal PLGF secretion.

**Yeast-two hybrid analysis of Chlamydia trachomatis inclusion membrane proteins**

**Chloe Backhaus, Erika Lutter**  
Oklahoma State University  
Department of Microbiology  
Subject Area: Biological Sciences

*Chlamydia trachomatis* is the leading cause of preventative blindness worldwide and the most commonly reported pathogen causing sexually transmitted infections. *C. trachomatis* replicates intracellularly within a vacuole, termed an inclusion, which is modified early in infection via the insertion of bacterially synthesized inclusion membrane proteins (Incs) into the inclusion membrane. Currently, the role that most Incs play in chlamydial pathogenesis is not known. To gain a better understanding of the function of Incs, a yeast two-hybrid screen was employed to identify Inc-host protein interactions. Two Incs, CT101 and CT728, and another bacterial protein, pKn5, were used to screen a random normalized HeLa cDNA library. After a low stringency screen, positive diploids were confirmed in higher stringency screen and prey plasmids isolated and sequenced. Positive identifications after bait dependency testing suggest roles for these bacterial proteins in mediating signal transduction pathways. Future experiments are required to verify these protein-protein interactions and confirm their roles in *C. trachomatis* survival and pathogenesis.
Microevolutionary Consequences of Eutrophication in Daphnia

Kristina Baker, Ryan Sherman
Oklahoma State University
Department of Zoology
Subject Area: Biological Sciences

Over the past century, increasing fertilizer usage has caused an increase in the amount of phosphorous in lakes. *Daphnia* produce resting eggs that can be preserved in lake sediments for centuries. Collecting and hatching these eggs allows us to compare the genetics and physiology of ancestral genotypes with that of extant descendants. Prior work indicated that a shift from a low phosphorous environment to a higher phosphorous environment is correlated with genetic and physiological shifts. Such shifts can happen only if there is substantial standing genetic variation in responses to altered P supply. I quantified the growth response of thirteen *Daphnia* genotypes from a single population under two P supply conditions. I found substantial variation in the growth of genotypes. The data produced is enabling us to choose genotypes with contrasting growth responses for competition trials in contrasting phosphorous supply conditions. Each genotype will be placed in a competition trial with three reference clones, and allozymes will be used to determine the number of each genotype at the end of the experiment. The project could provide empirical evidence that humans have not only changed the environment, but have also caused genetically based changes in animals living in these environments.

Audio Recognition with Applications in Security Monitoring

Blair Baldridge,
Oklahoma State University
School of Electrical and Computer Engineering
Subject Area: Physical Sciences Technology

Recognizing the environment around us is an important part of everyday life, and it allows us as human beings to make decisions necessary to perform tasks, or achieve specific goals. For us this is easy we are born with the ability to feel, taste, see, smell and hear, but for a computer or Surveillance system these are not easy tasks. This paper is going to describe a technique that can be used in order to perform audio recognition, by extracting different key features from an audio signal, and how these features are then used to perform audio classification. This work will explore the extraction of Mel-Frequency Cepstral Coefficients (MFCC’s), Zero Crossing Rates (ZCR’s), Short-Time Energy (STE), and Spectral Flatness (SFM) as features. Some of these features might contain redundant information, so we will also explore the use of a feature selection algorithm, which will minimize the total number of features extracted, while maximizing the number of correctly classified events. A Gaussian Mixture Model (GMM) is used as a classifier, and created from the extracted features during a training process. After the GMM’s have been created the extracted features from the incoming audio are compared to the models for audio classification.

Optimizing Dependency of Inexpensive Pressure Sensors

Asaph Matheus Barbosa, Rachel Mosier
Oklahoma State University
School of Electrical and Computer Engineering
Subject Area: Physical Sciences Technology

The purpose of this investigation was to determine whether an inexpensive pressure sensor could be constructed to provide dependency over time. Three types of sensors were constructed from directions available online. Each sensor was constructed according to the directions, varying the tape used to construct it. The resistivity of Velostat is affected by pressure, causing a change in resistance. Using a standard multimeter, preliminary tests were performed to analyze the performance of each sensor by measuring resistance. The sensors were connected to the multimeter. For ninety minutes, each sensor had twenty readings collected. Each reading was taken five minutes from the last, and the first was taken five minutes after connection. The first two readings contained no mass on the sensor. The next six had 20g, and the next
two had no mass. Finally, the next seven had 100g and the last two had no mass. This test was repeated for each sensor and the results were graphed. Upon analyzing the data, we have concluded all the sensors performed albeit at different levels of sensitivity. Each configuration tested responded very well to a significant change in pressure, by exhibiting a significant change in resistance.

Class II Injection Wells and Earthquakes in Oklahoma: A Proposal for Research
Caitlin Barnes, Seth Naizar, and Todd Halihan
Oklahoma State University
Environmental Science
Subject Area: Physical Sciences Technology

The number of earthquakes in Oklahoma has increased dramatically over the past few years. We propose to analyze the hydrogeology, including fluid injection rates, surrounding Class II fluid injection disposal wells and the onset of seismic events in the Oklahoma region. These datasets, along with locations of Class II disposal wells, will be analyzed to reveal distinctions between areas of active seismicity and areas of low to no seismic events relative to locations that include injection wells. A publication for a county-scale analysis of hydrogeological properties surrounding seismically active and seismically inactive locations near Class II injection disposal wells has not yet been completed for Oklahoma. This presentation reviews previous research comparing natural and induced seismic events, an explanation of Class II injection disposal wells, and the current research regarding seismicity in Oklahoma. The proposal outlines a methodological approach for mapping the patterns of seismicity by county and comparing characteristics of seismically active and seismically inactive areas in Oklahoma.

Using Saccharomyces cerevisiae to Identify Helicobacter pylori T4SS Effectors
Alyssa Barton, Bryce Burnett, Andrea Castillo
Eastern Washington University
Scholar Symposium Participant
Subject Area: Biological Sciences

*Helicobacter pylori* is a human gastric pathogen that infects 50% of the world’s population. Although many infections are asymptomatic, gastric disease occurs in 10-15% of those infected. Many virulent strains of *H. pylori* contain the cytotoxin-associated gene pathogenicity island (cagPAI), which encodes a secretion system (T4SS). *H. pylori* uses the T4SS to transfer the CagA protein from its cytoplasm into human gastric epithelial cells; this results in cell changes associated with disease. A recent study identified 24 potential CagA-like proteins by looking for key C-terminal amino acid residues present in CagA. Our goal is to test these potential CagA-like proteins for negative affects on eukaryotic cells. To do this, we have implemented a yeast system in which we will express the *H. pylori* CagA-like proteins and look for reduced growth of yeast. Thus far, we have tested CagA in this system and found that yeast growth is reduced when CagA is expressed in yeast compared to our negative control. We have cloned our first putative CagA-like protein, HP0119, into our vector and will test this protein for its ability to confer growth defects on yeast. In future studies we will test as many of the 24 CagA-like proteins as possible.

Urban and Rural Perceptions of Outdoor Recreation
Stephen Beck, Catalina Palacios
Oklahoma State University
Leisure Studies
Subject Area: Education

Outdoor recreation provides people opportunities to enjoy natural areas and participate in recreational activities such as nature appreciation, escape from daily routine, rest and relaxation, seeking for adventure, and spending time with others. To assist public agencies and private recreation providers in making decisions for outdoor recreation development, objective and quantitative data is required to better identify
preferences of urban and rural residents. This poster aims to investigate whether self-classified urban and rural residents differ in their interests, experiences, and perceptions of the importance of children being involved in outdoor recreation. Data was collected at the 2014 ODWC Wildlife Expo in Oklahoma and analyzed using chi-square analysis. A total of 292 voluntary participants, 18 years and above, participated in an on-site survey. Urban-rural differences were found in their interest related to hunting and shooting sports as well as their experience related to hunting. Overall, participants indicated a high level of importance for children being involved in both consumptive and non-consumptive outdoor recreation. The findings of this study provide outdoor recreation professionals information for planning and marketing recreational choices to both rural and urban residents.

Chlamydia trachomatis Recruits Protein Kinase A and

Amanda Behar, Amanda Behar, Erika Lutter

Oklahoma State University  
Department of Microbiology  
Subject Area: Biological Sciences

The obligate intracellular pathogen, Chlamydia trachomatis, usurps many host cell-signaling pathways from within a membrane bound vacuole, deemed an inclusion. C. trachomatis has been previously shown to recruit and activate Src family kinases at discrete microdomains on the inclusion membrane. These microdomains are theorized to be regions for additional kinase activity. This study investigated the recruitment of Protein Kinase A (PKA) and PKA phosphorylated substrates to the inclusion membrane microdomains during C. trachomatis infection. PKA was found to be sequestered to the inclusion membrane microdomains and colocalizing with active Src family kinases at mid to late infection. Phosphospecific antibodies to PKA phosphorylated substrates demonstrated that PKA substrates also colocalized with Src family kinases. Pharmacological inhibition of PKA activity resulted in a loss of PKA phosphorylated substrate recruitment and localization, while PKA recruitment remained unaffected. These studies provide novel insights into the diverse role of PKA during C. trachomatis infection and suggest that the active Src family kinase rich microdomains function as highly active kinase regions on the inclusion membrane surface that may be involved in many essential chlamydial processes.

An Examination of School Wellness Policies in Oklahoma using the Wellness School Assessment Tool

Jessica Berg, Kristin Zwerneman; Kevin Fink, PhD; Deana Hildebrand, PhD, SNS, LD; Nancy Betts, PhD, RD; Christi Erwin, MS

Oklahoma State University  
Department of Nutritional Sciences  
Subject Area: Social Sciences

Federal laws requiring schools to develop school wellness policies have the potential to decrease childhood obesity by improving school nutrition and physical activity environments. The objective of this study was to evaluate policy quality for 176 school districts in Oklahoma using the Wellness School Assessment Tool (WellSAT) and examine various socio-demographic characteristics. Comparisons were made between (1) policy compliance in conjunction with federal requirements; and (2) the comprehensiveness and strength of the policy’s wording related to wellness domains. Independent-samples t-tests, ANOVA, Kruskal-Wallis, and Mann-Whitney U tests were conducted to compare overall and subsection WellSAT strength and comprehensiveness scores with academic status, free and reduced price meal eligibility, and geographic location. Mean overall WellSAT comprehensiveness was 44.96, while mean overall strength score was 22.92 on a scale of 0-100 points. There were no statistically significant differences among district free and reduced price meal eligibility or geographic location and policy strength and comprehensiveness. Statistically significant differences were observed among policy quality and school district academic status. Local and state policy makers may have an opportunity to improve school environments by developing more comprehensive nutrition and physical activity policy statements and using stronger language for policy goals.
Microstructural and mechanical characterization of martensitic phases in ultra-sonic vibration assisted laser surface melted Ti-6V-4Al alloy

Sourabh Biswas, Salah Uddin Hamim, Raman P. Singh, Dr. Sandip P. Harimkar
Oklahoma State University
Department of Mechanical and Aerospace Engineering
Subject Area: Physical Sciences Technology

Ti-6V-4Al alloys are extremely popular in material research due to their high strength to weight ratio and corrosion resistance. In this study, the effect of acoustic streaming generated by ultra-sonic vibration assisted laser surface melting of Ti-6V-4Al alloys at varying vibration amplitudes was studied. A significant increase in melt-zone thickness was observed with increase in vibration amplitude, most likely due to the increase in thermal flux with increase in vibration assisted convection currents. It was observed that the extremely high cooling rates at the surface generated a lath structure characteristic of the martensitic α′ phase. The usual solidification structures of dendritic grain growth were observed only at deeper levels of melt-zone. The increase in acoustic streaming was observed to decrease texture index. The mechanical property characterization was performed by nano-indentation studies. The post laser treated USV samples exhibited considerably higher surface hardness and stiffness, and was analyzed to be the consequence of precipitation of α in α′ lathes.

Effect of Cooking for Kids Culinary Training on the Readiness of Oklahoma Schools’ Cafeteria Staff to Adopt New Food Preparation Techniques

Priscilla Blevins
Oklahoma State University
Department of Nutritional Sciences
Subject Area: Social Sciences

The purpose of the study was to assess the impact of a pilot chef-based culinary skills training program on school nutrition staffs’ readiness to integrate new food preparation skills into meal planning and preparation practices that meet new federal requirements. The training was conducted in 6 Oklahoma school districts. Focus groups using the Community Readiness Assessment model were conducted pre and post-training. After discussion of 6 unique dimensions, participants agreed on scores using a rated scale. Dimension scores were averaged to calculate the overall readiness score. A frequency analysis was used to describe the distribution of overall and dimension scores pre and post-training. Change in readiness was calculated by subtracting overall pre-training from post-training scores. 2 researchers familiar with the project to identify emergent themes independently reviewed recorded transcripts. The pilot training moved schools from the vague awareness stage to the preparation stage for making changes to food preparation practices. Staff had increased awareness of efforts to make and need for change but expected school nutrition specific examples in training. The pilot chef-based culinary training program had a positive impact on school nutrition staffs’ readiness to adopt new food preparation skills into meal planning and preparation practices.

The Effects of Stress Factors on the Location of Aha1 within Yeast Cells

Garret Boren, Robert Matts, Jessica Matts, Rita Miller
Oklahoma State University
Department of Biochemistry and Molecular Biology
Subject Area: Biological Sciences

Heat shock protein 90 (Hsp90) is an ATP dependent molecular chaperone that assists in the folding and function of many client proteins, including hormone receptors and protein kinases, as well as proteins that function in each of the six hallmarks of cancer. Aha1 is a co-chaperone of Hsp90, which activates the ATPase cycle of Hsp90, making it a potentially important chemotherapeutic target for the inhibition of cancer cell growth. This study focuses on the effects of stress factors such as the Hsp90 inhibitor geldanamycin (GA) on the subcellular location of Aha1 tagged with green fluorescent protein within budding yeast cells. Previous work suggested that Aha1 was dispersed throughout the cytoplasm of yeast
grown in rich media, but that GA caused Aha1 to appear in small foci in nitrogen starved yeast cells. Current work indicates that GA caused Aha1 to disperse from being concentrated within the nucleus to being relatively ubiquitous throughout the cell. The dispersion of Aha1 indicates that GA likely interferes with the transport and function of Aha1 within the nucleus, thereby, causing it to disperse into the cytoplasm. Thus, inhibition of Hsp90 appears to block the normal function of Aha1 within the nucleus.

**Somewhere in the Middle: Same-Sex Behaviors of Self-Identified Heterosexuals**

Colton Brown, Joe Currin, Samuel Farley  
Oklahoma State University  
School of Applied Health and Educational Psychology  
Subject Area: Education

Recalled childhood gender nonconformity (CGN), or recalled lack of conformity to society’s ideas of gender norms (Bailey & Zucker, 1995), is one of the only biodemographic markers consistently shown in research to positively correlate with men and women who endorse a non-heterosexual orientation (Lippa, 2008). Recalled CGN has sparingly been applied to heterosexual experiences, with some exceptions including studies on body dissatisfaction, masculinity, and femininity (Lippa, 2008; Grethel, 2007; & Strong, Singh, & Randall, 2000). The current study explores two research questions: a) do individuals who self-identify as heterosexual and endorse having non-heterosexual impulses recall having more CGN behaviors than individuals who identify as heterosexual and do not endorse having non-heterosexual impulses; b) what impact does having discordant sexual attractions, behaviors, and/or fantasies have on heterosexual individuals’ attitudes towards monogamy and casual sex? Researchers ran independent t-tests, using data from a sample of 1614 self-identified heterosexuals. Results indicated that men and women who identified as heterosexual and endorsed non-heterosexual attractions, behaviors, and fantasies recalled being more gender nonconforming and were more open to non-monogamous relationships and casual sex than heterosexuals who indicated lack of same-sex attractions. The results provide important information regarding stereotypes of heterosexuals' attractions, fantasies, and sexual behaviors.

**Baseline Study of Students’ Consumption of School Lunch Meal Components Prior to Implementation of the Cooking for Kids: Culinary Training for Oklahoma Food Service Professionals**

Lillian Carl  
Oklahoma State University  
Department of Nutritional Sciences  
Subject Area: Social Sciences

Since implementation of the Healthy Hunger-Free Kids Act, 2010, school cafeterias are seeing a decline in students’ school meal consumption. This study’s purpose was to 1) establish a baseline measure of Oklahoma students’ consumption of lunch components (entrée, grain, vegetable, and fruit) prior to the implementation of a pilot culinary-training program, and 2) compare trends between geographic location, grade level, and meal preparation system (on-site kitchen versus satellite system). A consumption analysis was conducted in six schools in spring 2014. Of the 1524 observations, students ate ¾ of the entrée, half the grain serving, and less-than-half of vegetable and fruit servings. Students attending urban schools, compared to rural, consumed significantly more of the entrée (0.77±0.01, 0.70±0.02 respectively) and vegetable (0.48±0.01, 0.39±0.02 respectively) (P≤0.001). Middle/high school students, compared to elementary school students, ate significantly more entrée (0.81±0.01, 0.68±0.01 respectively), grain (0.70±0.03, 0.48±0.02 respectively), and vegetable servings (0.51±0.02, 0.38±0.01 respectively) (P≤0.001). Controlling for grade level, the meal preparation system did not make a difference in consumption. Culinary-training efforts should focus on fruits, vegetables and whole grains. Identifying differences in menus served in urban versus rural schools and to secondary versus elementary school-age students may identify strategies that contribute to increased consumption.
Planned Behavior and Nutritional Labeling

Reginald Carmon
Oklahoma State University
School of Hotel and Restaurant Administration
Subject Area: Social Sciences

The objectives of this study are to (1) examine the attitude and behavioral intention toward nutritional labeling for fast-food restaurants, casual-dining restaurants and fine-dining restaurants; (2) examine different cultures behavioral intention toward consumers’ intention to read nutritional labeling in restaurants. A questionnaire was distributed to 300 participants through a university Research Center. The findings of this study provide valuable information for strategic marketing and training in order to understand consumer behavior in the hospitality industry.

Analyzing the Connectivity of Research Authorships within Neuroimaging Research

Branden Carr, Matt Vassar, Ph.D
Oklahoma State University
Biomedical/OSU-CHS/D.O./M.S.
Subject Area: Biomedical Sciences

Introduction: When studying scientific collaborators, social network analysis (SNA) is a meaningful way to elucidate important aspects of a body of literature and the contributors thereof. In particular, outcome measures such as which researchers are most influential in a particular field of study or which potential new collaborations are most rewarding may be determined using this approach. To date, the use of SNA as a way to examine social structures within Neuroscience, and more specifically neuroimaging, has been very limited.

Aim: The purpose of this study was to examine the social structures of scientific collaborations within the neuroimaging community.

Results: Sixty-six trials that applied neuroimaging modalities to study post-traumatic stress disorder were identified and retrieved for analysis. Social network analysis was used to construct a network map to visually represent co-authorships of researchers within the field. Results indicate that the social network of neuroimaging scientists who study PTSD has a somewhat dense structure.

Conclusion: Important characteristics of scientific networks can be demonstrated using SNA, offering the potential for additional lines of research within the neuroscience community.

Leisure Constraints to Participate in Intramural Activities of College Students

Dongwook Cho
Oklahoma State University
School of Applied Health and Educational Psychology
Subject Area: Education

Many campuses are now instituting leisure programs to improve students’ general quality of life. Among these programs, intramural sports activities have long been part of the organized recreational programs. However, higher education institutions require an understanding of elements that affect participation of students in intramural activities. The purpose of study is to investigate which constraints of college students affect to participate in intramural activities, and to determine if demographic variables influence leisure constraints of participation of college students in competitive intramural sports. The results of the study indicated approximately 55 percent of college students never or rarely (1~2 a month) participate in competitive sports activities. Structural constraints were the most powerful leisure constraints to participate of college students in competitive intramural sports. Intrapersonal constraints and interpersonal constraints were followed. An independent sample t-test was performed that sex on intrapersonal constraints were statistically significant (p<.01). A one-way ANOVA was performed that grade classification on intrapersonal constraints (p<.01)
and structural constraints (p<.001) were statistically significant. Additionally, the researcher would discuss methods to improve participation based on the observed constraints and propose other research opportunities that surfaced from the results.

Gender Differences in Body Image Perception, Weight Management Practices, and Food Choices of High School Students in the Bangkok Metropolitan Region

Pitipa Chongwatpol, Gail E. Gates
Oklahoma State University
Department of Nutritional Sciences
Subject Area: Social Sciences

The objective of this study was to assess body image perceptions and weight management practices among grade 10-12 students from 9 single and mixed gender schools. 2082 questionnaires with height, weight, body image perception using Stunkard’s figure rating scale (FRS), food choices, physical activity, and weight management practices were included in the analysis. More than 66% of females selected a thinner ideal figure than their current figure. In contrast, among males, 44.3% wanted a thinner figure, but 35.1% wanted a bigger figure. However, univariate analysis observed school type but not gender differences in the degree of body image dissatisfaction; students in single gender schools had more body dissatisfaction. Females reported using more weight management practices but less physical activity than males, while males reported healthier food choices. In conclusion, females and males had similar levels of body dissatisfaction but a majority of females want to be thinner, while males want to be either smaller or bigger. These results support the contention that it may not be appropriate to calculate an average dissatisfaction score from FRS for males because they report a preference for both smaller and bigger figures; therefore, the average dissatisfaction score will result in underreporting of body dissatisfaction.

Arbuscular mycorrhizal responsiveness of Panicum virgatum across varying geographic locations

Parker Coppick, Dr. Gail Wilson
Oklahoma State University
Natural Resource Ecology
Subject Area: Biological Sciences

Increasing interest in production of switchgrass (Panicum virgatum) for cellulosic bioenergy feedstock in current agricultural land and for successful grassland restoration of abandoned agricultural fields requires an understanding of the influence of soil nutrient availability and genotypic origin on establishment and productivity of this key grassland species.

High nutrient and water use efficiency associated with effective mycorrhizal symbioses is critical to the sustainable and economical biomass production of switchgrass as a cellulosic bioenergy crop and for successful restoration practices. Therefore, we present information on the relative mycorrhizal responsiveness

\[
(rMR = \frac{(M_{myco} - M_{nonmyco})}{M_{myco} \times 100}), \text{ where } M \text{ is total dry mass of switchgrass ecotypes representing upland and lowland populations.}
\]

We evaluated 13 genotypes collected over a wide geographical range comprising the natural habitats of P. virgatum in North America. Data indicates that, generally, neither soil (agricultural or native) nor genotypic variation of switchgrass strongly influence mycorrhizal responsiveness. In fact, in native soil 12 of 13 genotypes exhibited >90 % \( rMR \), indicating these genotypes are unable to grow beyond the seedling stage in this low nutrient soil without the symbiosis. However, there was a genotypic influence of several genotypes (Alamo, Cimarron, Stuart) as the \( rMR \) differed between the agricultural and native soils.
Web-Based Modeling of an Eastern Redcedar Supply Chain

Collin Craige, M.D. Buser, R.S. Frazier, R.B. Holcomb, S.S. Hiziroglu
Oklahoma State University
Biosystems and Agricultural Engineering
Subject Area: Physical Sciences Technology

A body of knowledge exists for many aspects of the Eastern Redcedar commodity supply chain; however, available data is not sufficient to fully evaluate various commercialization strategies. The ability to model a supply chain in its entirety, from locating a facility through the harvest, transport, processing, and refining stages is necessary to characterize the feasibility of a given strategy. To provide this ability, a comprehensive, modular, commodity based supply chain model was developed as an analytical tool. The model is web based, to provide improved accessibility and ease of use while the modular structure provides flexibility. ArcGIS Online is used to perform location allocation, develop service areas, and biomass yield maps. Costs at each stage in the supply chain are then calculated using this information and client inputs. Monte Carlo simulation and one-way sensitivity analysis are used to derive the cost distribution, interdependency, relative cost impact, and relative sensitivity of variables on total system cost. The model is expected to reduce the risk associated with high level production of Eastern Redcedar commodities and provide a strong foundation for expansion to model other biomass feedstocks.

Predicting Recalled Childhood Gender Nonconformity Using Multi-Dimensional Assessment of Sexual Orientation in Adults

Joseph Currin, Randolph Hubach, Hugh Crethar
Oklahoma State University
School of Applied Health and Educational Psychology
Subject Area: Social Sciences

Gender nonconforming behaviors in children (known as Childhood Gender Nonconformity, CGN) positively correlate with adult men and women who endorse a non-heterosexual orientation. Unlike previous studies that use a traditional classification of sexual orientation into three finite groups (heterosexual, homosexual, bisexual), the current study assessed sexual orientation of participants (N = 2,372, 1,399 women, 973 men) using self-identification, as well as same- and opposite- sex attractions, behaviors, and fantasies to determine the relationship of these dimensions of sexual orientation to recalled CGN. All correlations were significant for men and women, so a stepwise multiple linear regression was conducted to determine what variables would predict if a person recalled CGN behaviors. Stepwise regression analyses revealed for men that same-sex attraction (β = -.219, t(968) = -3.496, p < .001) and opposite-sex attraction (β = .243, t(968) = 3.880, p < .001) significantly predicted recalled CGN. For women, opposite-sex attraction (β = .322, t(1396) = 12.727, p < .001) significantly predicted recalled CGN. Among the dimensions of sexual orientation assessed, only attraction significantly predicted recalled CGN. The results present a challenge to the sole usage of self-identified sexual orientation as a valid representation of a person’s actual sexual orientation.

Mutational Additivity in Key Residues of Photoactive Yellow Protein

Nicolas Daffern, Masato Kumauchi, Wouter D. Hoff
Oklahoma State University
Department of Microbiology
Subject Area: Biological Sciences

Photoactive Yellow Protein (PYP) is a photoreceptor involved in light detection in several different bacteria. The wild type protein, which consists of a small apoprotein and a chromophore, undergoes a photocycle when exposed to blue light. The goal for the project was to explore the principles of additivity in combining multiple point mutations in a protein. PYP has been studied extensively using site-directed mutagenesis, revealing that the N43A and E46Q mutations strongly alter the functional properties of this protein. We report experimental results on a double mutant combining the N43A and E46Q mutations. This double
mutant was expressed in *E. coli* and spectroscopic analysis was performed on the purified protein in order to quantify the mutations’ effect on several functional attributes that are directly related to the energetics of the photocycle. These data on the pKa of the chromophore, visible absorbance maximum of PYP, and PYP photocycle kinetics were compared with the previously determined effects caused by the respective single mutants. This analysis revealed that the changes in energetics of the single mutants for these three properties exhibit almost perfectly additive behavior. This result implies that these two mutations act upon PYP’s photocycle through two distinct mechanisms.

**Symptoms of Depression Mediate the Relationship Between Co-rumination and Suicide Ideation in College Students**

Jaron Dowell, David W. Hollingsworth, M.S., LaRicka R. Wingate, Ph.D.

Oklahoma State University  
Department of Psychology  
Subject Area: Social Sciences

Suicide is a major health concern for college students, as it is the second leading cause of death in that population (National Alliance of Mental Illness, 2012). Co-rumination is an identified risk factor of depression which is a predictor of suicide (Rose et al., 2007). Co-rumination refers to extensively discussing and revisiting problems, speculating about problems, and focusing on negative feelings in a dyadic relationship (Rose, 2002). Further, co-rumination is thought to be a “trade off,” as it is related to an increase in relationship quality, but also an increase in negative mental health outcomes (Rose, 2002). Although there is evidence of a relationship between co-rumination and depression, no study has examined the relationship between co-rumination and suicide ideation. It was hypothesized that symptoms of depression would mediate the relationship between co-rumination and suicide ideation. Results of a mediation analysis using 1,000 bootstrapping samples indicated that symptoms of depression significantly mediated the relationship between co-rumination and suicide ideation (95% BC CI of .0252 to .1163), supporting the hypothesis. The results demonstrate that college students who co-ruminate may increase symptoms of depression, which in turn could lead to an increase in thoughts of suicide.

**Gender Socialization and Attitudes Towards Foreign Aid**

Megan Downing, Dr. Amy Moreland  
Sul Ross State University  
Scholar Symposium Participant  
Subject Area: Social Sciences

This study filled in the gap between research done on social attitudes and attitudes towards foreign aid, and found a relationship between the two areas. In political science there exists research on the “gender gap” where foreign policy is concerned; differing genders can lead to differing opinions. In psychology there is research on social attitudes having an effect on personality and opinion. The hypotheses centered on the main idea that if respondents had a more progressive attitude towards women’s roles, then they would also have a more supportive view of foreign aid. A survey was conducted amongst 86 college students in political science classes. It was found that the hypotheses were supported in that, generally, more progressive attitudes towards women’s roles also correlated with a more supportive attitude towards foreign aid and non-isolationist attitudes, except in the case of spending on foreign aid. Progressive attitudes towards women in the public space had more occurrences of being positively correlated with supportive attitudes towards foreign aid. These findings indicated an unexplored area of research towards discerning public attitudes towards foreign policy. This could be a target area important to study to better understand public opinion on international issues and what drives it.
Infant Behavioral and Physiological Responses to Positive Emotional Stimuli

Elisa Duell, Evan Jordan, Janna Colaizzi, Brett McVey, Sharon Simon, Collin O'Leary, David Thomas

Oklahoma State University
Department of Psychology
Subject Area: Social Sciences

Emotional contagion (EC) refers to the ability of a person to imitate or share emotions with another person. Previous research has documented negative EC in infants as a precursor to empathy, though positive EC has not been addressed. The purpose of this study is to examine positive EC in infancy through a variety of behavioral and physiological measures. In response to a video recording of other infants laughing, infant facial expressions will be evaluated as an outward behavioral marker of the intensity of both positive and negative emotional reactions. Salivary cortisol will be assessed as an indicator of the hypothalamic-pituitary-adrenal axis, which is particularly sensitive and responsive to social and emotional situations. Finally, heart rate data will be analyzed as a measure of the autonomic nervous system. It is expected that positive behavioral and physiological emotional responses will occur as a result of the positive visual/audio stimuli. Therefore, cortisol levels are predicted to elevate throughout the experimental paradigm as a reflection of the infant’s emotional responses and heart rate is expected to indicate both attention to the stimulus and emotional arousal. By exploring the nature of positive emotional contagion in infancy, early empathic development in humans may be better understood.

A Study of the Characteristics of Entrepreneurial Food Truck Business Owners and the Factors that Influenced their Start-Up Decision

Jake Duke, Murat Hancer

Oklahoma State University
School of Hotel and Restaurant Administration
Subject Area: Social Sciences

In the last five years the food truck industry has seen major growth and this study aims to gain a better understanding of the entrepreneurs who are the driving force behind this trend. Face-to-face interviews will be conducted with food truck owners from four different cities in Oklahoma. Food truck operations have experienced their highest growth in university towns and metropolitan cities and this has influenced the choice of the four location used for this study. The selected locations are the university towns of Stillwater (home of Oklahoma State University) and Norman (home of the University of Oklahoma), and from the cities of Tulsa and Oklahoma City (the two largest cities in the state). The interviews will be conducted at monthly food truck events that occur in each location. The results will provide valuable information on the characteristics of food truck owners and the factors that motivated them to start this new venture. Findings from this study will provide useful knowledge about a segment of small business entrepreneurs that has previously been unexplored.

Gender Differences in Beliefs about Infant-Directed Speech: A Role for Family Dynamics

Gabrielle Emory, Shelia M. Kennison, Jennifer Byrd-Craven

Oklahoma State University
Department of Psychology
Subject Area: Social Sciences

The research investigated the relationship between family dynamics and the beliefs about the benefits of talking to infants. Prior research has shown that infants’ language development is enhanced by experiencing speech. We reasoned that one’s relationships with parents would be related to the extent to which young adults’ view talking to infants as beneficial. We hypothesized that women would be more likely than men to view talking to infants as beneficial. In the present research, we assessed family dynamics, beliefs about infant-directed speech, and demographics with 400 undergraduates. The results of our study supported our
hypothesis, as men were less likely than women to view talking to infants as beneficial. Further, the results showed that for both men and women, having a negative relationship with their mother significantly predicted their beliefs about the benefits of talking to infants; the more negative the relationship with the mother, the less likely they were to view talking to infants as beneficial. The research has implications for how parenting practices are taught, particularly to young adults who have experienced strained relationships with parental figures.

It’s Game Time: Alcohol Consumption at College Tailgates and Related Consequences

Rachel Feddor, Eleanor L. Leavens, & Julie M. Croff
Oklahoma State University
Department of Psychology
Subject Area: Social Sciences

Research suggests that alcohol consumption increases during football tailgates (Neal & Fromme, 2007). Increased alcohol use has been shown to be associated with consequences ranging from hangovers to unwanted sexual activity and death (White & Hingson, 2014). The purpose of this study is to evaluate the drinking behaviors of tailgaters and subsequent alcohol-related consequences.

Participants (N = 89) were recruited from tailgates at a south central university. Participants were asked to provide a breath sample and complete a questionnaire. Participants were given the opportunity to participate in a follow up survey.

The majority of participants reported attending the tailgate in order to socialize (n = 78, 87.6%) and have fun (n = 46, 51.7%). Few participants (n = 6, 6.7%) had played drinking games at the tailgate. Participants exhibited mean BACs of 0.028 (SD = .043) during the tailgates. Increased BACs were significantly associated with resulting negative consequences at follow up (r = .313, p ≤ 0.05), number of drinks consumed (r = .543, p ≤ 0.001) and past two-week heavy drinking episodes (r = .467, p ≤ 0.001).

This expands the literature on alcohol-related negative consequences in the context of college game day tailgates.

Iron Regulatory Protein 1 Sensing of Iron during Murine Erythroleukemia Cell Differentiation

Joanna Fiddler, Stephen Clarke
Oklahoma State University
Department of Nutritional Sciences
Subject Area: Biomedical Sciences

Mitochondria are critical to cellular iron (Fe) metabolism due to roles in Fe-S cluster biogenesis and heme biosynthesis. Defects in mitochondrial Fe import impair erythroid differentiation. Iron levels are sensed by cytosolic RNA binding proteins known as Iron Regulatory Proteins (IRPs) that regulate the translation/stability of mRNA encoding proteins involved in Fe metabolism. IRP1 exhibits both aconitase and RNA binding activities. In the presence Fe, IRP1 contains a 4Fe-4S cluster required for aconitase activity. Under low Fe conditions, IRP1 lacks an Fe-S cluster and exhibits RNA binding activity. Thus, mitochondrial Fe status affects regulation of IRP1. Evidence suggests Fe deficiency increases miR-181d expression. SCL25A37, a putative miR-181d target, is essential for mitochondrial Fe import. To understand the role of miR-181d on cluster biogenesis, we assessed murine erythroleukemia (MEL) cell differentiation. Differentiation increased the expression of Hba mRNA and hemoglobin staining. Post-differentiation Fe chelation did not affect Hba mRNA or hemoglobinization, nor did it affect IRP1. Pre-differentiation chelation reduced Hba mRNA though no change in IRP1 was observed. Differentiation increased IRP1 activity ~2.5-fold. These results suggest efficient targeting of Fe to heme biosynthesis during differentiation. Current studies are directed at understanding the role of miR-181d on Fe-S cluster biogenesis during differentiation.
Diel Growth and Lipid Accumulation of Microalgae in Continuous Culture

Dylan Franks, Bill Henley
Oklahoma State University
Botany
Subject Area: Biological Sciences

Algae are known to accumulate lipids under nitrogen limitation but this results in decreased photosynthetic efficiency and growth rate due to the breakdown of photosynthetic machinery. However, recent discoveries demonstrate the possibility of maintaining a minimal growth rate while accumulating lipids. However, the link between diel growth, variations in lipid content and long-term accumulation and diel yield have yet to be demonstrated. Continuous culture is a powerful experimental tool and can help maximize lipid yields by optimizing photosynthetic parameters and the degree of N limitation. I have been working with a cycloturbidostat: a continuous culture system subject to a photoperiod, which maintains a constant culture density using optical measures and by altering the dilution rate. In continuous culture, conditions are in steady-state, thus cell physiology and growth rate do not change over time; this is referred to as balanced growth. This allows for observations of algal physiology determined by steady-state conditions. This presents the opportunity to systematically manipulate N concentration to elucidate the underlying patterns of N limitation, diel growth and lipid accumulation. The purpose of my research will be to characterize the physiological patterns of photosynthetic efficiency and lipid accumulation exhibited in response to various degrees of nitrogen limitation.

Who Are You Again? Unique Challenges for a Community Needs Assessment in a Rural and Impoverished Area

A. Fae Frederick, Julianne Yavorski
Oklahoma State University
Counseling Psychology
Subject Area: Social Sciences

Through the Building Resilient Communities Project this team conducted a three phase community needs and capacity assessment centered in community-based participatory research principles. This assessment was conducted to assist in the planning and implementation of initiatives to bring resources to Coyle and surrounding communities. This grouping of rural communities struggles with many issues, such as: food security, poverty, and low parental involvement in schools. Throughout the assessment, many unique findings and challenges surfaced while recruiting participants, and in participant’s responses. Word of mouth from invested community members was by far the biggest asset. Our solutions and other potential solutions to experienced and projected issues are presented. This information may be useful to other researchers who are planning on conducting research with rural disadvantaged populations or are currently experiencing roadblocks while working with this population.

Potentiated startle response best predictor for social fears

Oklahoma State University
Department of Psychology
Subject Area: Social Sciences

Advances in psychophysiological recording techniques have broadened the range of available measures used to assess anxiety. In order to expand our understanding of human emotions, it is important to examine the relationship between self-report and physiological assessment measures. The current study aims to identify which peripheral physiological measure best predicts high levels of self-reported social fears. Fifty-seven individuals were recruited from an online recruiting system (SONA) at a Midwestern University. Participants completed a measure that assessed trait level cognitive strategies used by individuals prior to social situations including rehearsal for upcoming situations, catastrophizing, and thinking about past social
situations (Hinrichsen & Clark, 2003). Galvanic Skin Response (GSR), an index of the electrical conductivity of the skin, Respiratory Sinus Arrhythmia (RSA), an index of cardiac parasympathetic activation, and Startle magnitude were recorded while subjects engaged in a standardized procedure aimed at increasing attentiveness to anticipatory processing (Mills, Grant, Judah, & Lechner, 2013). Results suggested that a potentiated startle response is the best predictor of social fears while controlling for RSA and GSR.

**Attribution Characteristics of Teachers of Higher Education – Insights from an Exploratory Study**

**Jun Fu, Rhonda Lawes, Christal Strickland**

*Oklahoma State University*

*Educational Psychology*

*Subject Area: Education*

In this study, we conducted in-person interviews with six higher education faculty members. The purposes of the interviews were to further explore in the context of higher education the faculty’s perceptions about students’ motivation and their own attributional characteristics, as well as their individual motivations for teaching. The results of this study provide a better understanding of how the conceptual psychological constructs (locus and stability) suggested by Weiner’s attribution theory (1986) might function in practice. In addition, this study shows that within the higher education context, the self-serving biases are less evident among the faculty members in evaluating students’ performance.

**Worry and Enhanced Emotional Processing of Neutral Stimuli: Evidence from Event-Related Brain Potentials**

**Tiffany Gatanis, Thomas Stager, Paige Howell**

*Oklahoma State University*

*Department of Psychology*

*Subject Area: Social Sciences*

Worriers show less distinction between aversive and neutral images as indicated by the amplitude of the late positive potential (LPP), a neural signal of stimulus salience (Grant, Judah, White, and Mills, 2014). However, it is unclear whether this effect is driven by reduced LPP for aversive images or enhanced LPP for neutral images. This study measured the LPP while 27 worriers and 28 low worry controls viewed three blocks of images. The first and third blocks consisted of 100 randomly presented neutral images, and the second consisted of 50 neutral and 50 aversive images. There was a significant interaction between worry group and picture type, $F(1,53) = 4.27, p = .04, \eta_p^2 = .08$. Pairwise comparisons suggested that worriers showed enhanced LPP amplitude for neutral images ($M = 5.16, SD = 3.87$) compared to controls ($M = 2.93, SD = 3.87, p = .037$). This may be because anxious subjects typically show enhanced use of cognitive resources in attention tasks (Eysenck et al., 2007). Alternatively, worry may be a process which loads neutral events with emotional baggage so as to brace for negative events and mitigate large increases in the distress which might result (Newman & Llera, 2011).

**NASA Preservice Teacher Instituted (PSTI): Comparing Four Preservice Science Teacher Training Models**

**Catherine Graves, Toni Ivey, Steve Marks**

*Oklahoma State University*

*College of Education*

*Subject Area: Education*

The Preservice Teacher Institute (PSTI), offered through NASA’s Minority University Research and Education Project, seeks to increase the number and diversity of individuals who complete preservice
teacher programs with an ability to (a) increase their students’ cognitive achievement in science, technology, engineering, and mathematics (STEM) areas and (b) improve their students’ attitudes toward STEM and STEM careers by providing content-based training at various NASA Centers. The purpose of this mixed-methods study was to analyze the effectiveness of four PSTI models conducted at two NASA centers between 2013-2014. Participants in this study included 113 undergraduate students pursuing degrees and certification in education. Results suggested that face-to-face workshops that provided preservice teachers with an opportunity to teach lessons to students positively influenced participants’ science teaching self-efficacy. Additionally, the sequencing of the online and face-to-face components of the hybrid PSTI models may have affected learning and attitude outcomes. Findings of this study suggest that preservice teachers may benefit more in a face-to-face learning environment, especially in a science content area.

Architecture and Interior Design as Complementary, Integrative Medicine: The Relationship Between Space and Air Toxicity in Healthcare Environments

Nicole Gumm
Oklahoma State University
Department of Design Housing & Merchandising
Subject Area: Social Sciences

Interior design focuses more on sight than any of the other senses and is hesitant to consider other dimensions that are integral to experiencing architecture and interior design. Continually neglected as a critical component of design is the olfactory sense, although evidence shows it is indispensable to the quality of an area. Researches of cognitive, perceptive, cultural, social, and anthropological phenomena indicate air quality is not an inherent component of spaces but is critical to human health. The problem with air quality is that it is evanescent and intangible. Because of this evanescence it is difficult to govern, and therefore, is a deficiency of interior design. Because of the indefinite nature of air quality, VOC’s (volatile organic compounds) should be regarded similarly to sound and natural light, which are equally intangible and dependent on the natural course of time. The relationship between space and air toxicity is defined by the components of the space: The furnishings, inhabitants and activities that occur over time, as well as the orientation of the space, humidity, and persistence, saturation, timing and nature of the air impact the air quality in a space. This study explored how implementation of indoor gardens can improve indoor air quality by counteracting VOC’s and thus, lowering the air toxicity in the environment and allow interior design of healthcare facilities to contribute as an important, complementary aspect of healing; architecture and design as complementary, integrative medicine.

Exploring Factors That Effect Patient’s Comfort During an In-Clinic Sleep Test: Applications of SAS and NVivo Text Mining

Mercan Haddad Derafshi, Rupesh Agrawal, Mary Ruppert-Stroescu, Ph.D.
Oklahoma State University
Department of Design Housing & Merchandising
Subject Area: Social Sciences

Diagnosis of Obstructive Sleep Apnea is performed with a sleep study where the patient visits a sleep lab overnight. The cost of this test is significant and the untreated sleep apnea could result in major health risks. The purpose of this study was to investigate sleep apnea patients’ attitudes towards in-clinic sleep tests, identify common themes with respect to their sleep behaviors, clothing preferences, and to distinguish factors that affect their comfort during the sleep test. Twelve participants were interviewed. Data was analyzed using NVivo10 and SAS. With NVivo the researcher read the interviews and identified common themes. In comparison, SAS was used to first parse the data from each research question, second to filter text to determine separate relevant terms. Finally, to identify appropriate text mining-to-theme extraction/clustering/link analyses. During the sleep test, participants expressed discomfort with regards to the oxygen mask, wires, and sensors that were attached to the patient’s head. All the participants were interested to do the sleep test inside their homes. Results of this study to develop and evaluate a wearable
Dependent Personality Disorder: Five Factor Model Perspective

Ashley Hadwiger, Neil Meyer, Hilary Deshong, Stephanie Mullins-Sweatt

Oklahoma State University
Department of Psychology
Subject Area: Social Sciences

Dependent personality disorder as a category is characterized by excessive reassurance seeking and by an unrealistic fear of being left alone in the DSM (APA, 2013). Alternatively, exploring dependency dimensionally instead of categorically seems to be better supported by the literature (Clark, 2007). The five-factor model of personality (FFM) is one way of dimensionally conceptualizing personality (Costa & McCrae, 1992). Specifically, the Five-Factor Dependency Inventory (FFDI; Gore et al., 2012) was created to measure dependency from the FFM perspective. It was hypothesized that extraversion, openness to experience, and conscientiousness were negatively correlated with the FFDI and that neuroticism and agreeableness were positively correlated with the FFDI. To evaluate this hypothesis, 32 undergraduates (Males= 11, Females= 21) ranging from 18 to 21 years of age (M=19.13, SD=.976) completed the NEO-PI-R self report survey. Results did not support our initial hypotheses, however that may be due to a limited sample size. Upon further exploration of the data we found that FFDI subscale subservience was negatively correlated with openness to experience (r=-.397 p=. 049) as well as consciousness (r=-.393 p=.047). Further studies with larger sample sizes may find support for our initial hypotheses.

Duality in Shakespeare: A Comparative Gender Study of Antony and Cleopatra and Richard II

Matthew Hall

Sul Ross State University
Scholar Symposium Participant
Subject Area: Humanities

In a body of work that includes double meanings, twins, pairs of lovers, and (generally two) warring rulers, Shakespeare uses duality in most, if not all, of his work. These two plays in particular both show gendered distinctions, but in a vastly different way. In Richard II there are two kings, one of whom is rising while the other is falling. In Antony and Cleopatra, there are also two different rulers but of totally different homelands. Richard II presents an interesting division within England with Richard and Bolingbroke as the feminine and masculine aspects of that particular play. Antony and Cleopatra shows a gendered distinction between two nations, where Rome and Egypt are masculine and feminine respectively. The plays’ two protagonists appear to blend masculinity and femininity seamlessly which adds yet another layer to an already layered duality. The complementary facets within the people of the plays, within the genres of the plays, and within associations linking the real world and the plays, all show an expert hand at work.

Label design preferences of consumers: An exploration of labels used on meat products

Nahide Hancer, Dr. Greg Clare

Oklahoma State University
Department of Design Housing & Merchandising
Subject Area: Social Sciences

Labels have been regarded as one of the main sources of consumers to get information about product specifications. By reading and/or analyzing label information, a consumer may or may not buy the product. Therefore, there are really essential parts in decision making process. Labels give crucial information not
Anxiety Symptoms Moderate the Relationship between ADHD and Impulsivity  
Bridget Hannah, Connor Patros, Sarah Lea, Stephanie Tarle, Matt Alderson  
Oklahoma State University  
Department of Psychology  
Subject Area: Social Sciences

Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder that is diagnosed in approximately 5% of children worldwide (Polanczyk, Silva de Lima, Horta, Biederman, & Rohde, 2007), and is primarily characterized by impairing inattention and/or hyperactivity/impulsivity. Individuals diagnosed with ADHD are at an increased risk to be diagnosed with a comorbid anxiety disorder (Jensen, Martin, & Cantwell, 1997), and the complex interaction between ADHD and anxiety symptoms on outcomes of ADHD (e.g., impulsivity) is relatively under-examined. The current study examined the moderating effect of anxiety symptoms on the relationship between ADHD group membership and impulsivity. Forty-two carefully-diagnosed children (21 ADHD, 21 typically developing [TD]) completed a computer-based, objective measure of impulsivity, and provided self-report ratings of anxiety via the Revised Children’s Manifest Anxiety Scale: Second Edition. Collectively, analyses indicated a significant group (ADHD, TD) by anxiety (low, high) interaction, such that high anxiety was associated with greater impulsivity in the ADHD group and decreased impulsivity in the TD group. These findings suggest that anxiety may be an important variable to consider when treating an individual diagnosed with ADHD, as anxiety symptoms may increase the likelihood that the individual will engage in more dangerous, impulsive behaviors.

Inhibitory Effects of Organic Sanitizers against Pathogenic and Spoilage Microorganisms on Baby Spinach  
Leah Harrison, Radhika Kakani, Pushpinder Kaur, Divya Jaroni  
Oklahoma State University  
Department of Animal Science  
Subject Area: Biological Sciences

Antimicrobial efficacy of organic sanitizers and natural compounds were evaluated on contaminated organic baby spinach in 2 different experiments. The first experiment evaluated the inhibitory activity of organic sanitizers (C8C10 and CG100) at 0.2 and 0.4% concentrations against Escherichia coli 0157:H7. Leafy greens were inoculated with a cocktail of two E. coli 0157:H7 strains and washed with the antimicrobial solutions for one or two minutes. The treated leaves were stored at 4°C and sampled on days 0, 1, and 3 of storage. Wash time did not have any effect on the bacterial growth. All treatments resulted in approximately 1.5 log reduction of bacterial populations.

Second experiment was designed to evaluate the antimicrobial activity of Oregano and Cinnamon essential oils and their primary constituents, Carvacrol and Cinnamaldehyde, respectively, at 0.5% concentration against Lactobacillus brevis on organic baby spinach. Leaves were inoculated with 106 CFU/ml of L. brevis and washed with the antimicrobial wash solutions for 2 minutes. The treated leaves were stored at 4°C and
sampled on days 0, 1, and 3 of storage. No bacterial growth was detected from Carvacrol or Oregano essential oil treatments. One log reduction in bacterial populations was observed with Cinnamaldehyde and Cinnamon essential oil treatments.

**Principal leadership behaviors and student outcomes: An examination of transformational, transactional, and servant leadership**

Alexandra Holter  
Oklahoma State University  
School of Education Studies  
Subject Area: Education

The high stakes accountability environment in which schools currently operate demands leadership behaviors that produce enhanced student outcomes. However, school principals are often caught in a complex web of competing stakeholder demands within large bureaucratic systems. Specifically, principals must fulfill high stakes accountability mandates while also cultivating an environment that enhances stakeholder morale while maintaining the health, safety and well-being of students and faculty. This study explores the influence of transformational, transactional, and servant leadership behaviors on student outcomes on high-stakes mandated tests using the theoretical framework of Self-Determination Theory. Additionally, this study will explore the relationship between principal leadership behavior and collective faculty trust to gain a better understanding of whether leadership behavior works through collective faculty trust to influence student outcomes.

**Effects of Social Anxiety Disorder on Respiratory Sinus Arrhythmia**

Oklahoma State University  
Department of Psychology  
Subject Area: Social Sciences

Social anxiety disorder (SAD) is a common psychological disorder where individuals feel uncomfortable in social settings. Social anxiety can be extremely impairing; therefore, it is important to continue to study SAD. This study examined how physiological responding, specifically respiratory sinus arrhythmia (RSA), is linked to social anxiety.

Participants high (HSA; N = 43) and low (LSA; N = 42) in social anxiety symptoms engaged in either a negative anticipation task or distraction thought task. We examined changes in RSA throughout several time points in this study.

HSAs showed significant decreases in RSA (ps ranged from .00-1.00) over several time points, suggesting increases in anxiety. However, LSA participants showed no significant change (ps ranged from .17-1.00) over time. Those in the Anticipation condition experienced significant changes at multiple time points (ps ranged from .00-1.00), while those in the Distraction group only had a significant change at one time point (ps ranged from .029-1.00). We can conclude that HSA participants and those who engage in negative anticipation experience decreased RSA and therefore are more prone to experience anxiety-related physiological responses. More research needs to be done to determine what type of settings induce social anxiety as well as how to control it.
The Construction of Genetic Map and QTL Mapping of Some Energy Related Traits in Sweet Sorghum

Jian Huang
Oklahoma State University
Plant and Soil Science
Subject Area: Biological Sciences

Searching for renewable feedstocks for bioenergy to subsidize fuel shortage, it has been recognized that sweet sorghum is a viable candidate for bioethanol production because it is high sugar content, high photosynthetic efficiency and resistance to the barren. However, sweet sorghum breeding, cultivars, and varieties suitable for bioethanol production are essentially lacking at the present time. In order to become a high-performance energy feedstock, biofuel sweet sorghum crops requires higher sugar yield and breeding high-quality varieties. Like other energy crops, become one of the important bioenergy crops in the future. To meet the demand from sorghum growers and the bioenergy industry, we will through conventional plant breeding and molecular marker-assisted selection technology to identify biofuel-related traits or genes. In this study, we build the SSR molecular marker linkage map with sweet sorghum PI653411, LS-A generation plants bagged self obtained 287 F2 plants, and energy-related traits including plant height, stem diameter, biomass and brix in stem juice were quantitative trait locus(QTL) mapped. in order to providing foundation for marker assisted selection in sweet sorghum breeding and precise mapping of major effect QTL.

Role of Iron in Controlling Circadian Gene Expression: Does Iron Deficiency Increase Risk of Metabolic Disease?

Katherine Janike, Traces Soh, Joanna Fiddler, Edralin Lucas, Brenda Smith, Dingbo Lin, and Stephen Clarke
Oklahoma State University
Department of Nutritional Sciences
Subject Area: Biological Sciences

Lifestyle and dietary changes in the last half-century have given rise to a series of nutrient-based metabolic disorders including cardiovascular disease, metabolic syndrome, and diabetes. The increased prevalence of these disorders can attribute to epidemic levels of overweight and obesity affecting our society. Investigation of the prevention and treatment for these disorders has provided insight into other factors, including disturbances of circadian rhythm (CR), which may further enhance disease risk. Disruption of CR is implicated in altering glucose and lipid homeostasis, thereby contributing to the risk of developing metabolic diseases including obesity, diabetes, and cardiovascular disease. Despite an understanding of the interactions between circadian regulation and metabolism, the response of the circadian clock to nutrient signals has yet to be elucidated. The primary objective of this project is to examine the extent to which iron can signal circadian sensors and affect circadian rhythmicity, thereby contributing to metabolic dysregulation. To examine the molecular mechanisms controlling gene expression in liver, we are establishing the mouse hepatoma cell, Hepa 1-6, as a model. The validity of this system is being evaluated by monitoring the response to iron chelation (to mimic iron deficiency) and assessing circadian gene expression.
The anti-inflammatory effects of wheat germ oil on lipopolysaccharide-activated human monocytic (THP-1) cells

Sawanya Janthachotikun, Sandra Peterson, Joanna L. Fiddler, Stephen L. Clarke, Barbara Stoecker, Nurhan Dunford, Brenda J. Smith, Edralin A. Lucas
Oklahoma State University
Department of Nutritional Sciences
Subject Area: Biomedical Sciences

Heart disease is the leading cause of death, and the underlying pathological feature is atherosclerosis. Atherosclerosis is an inflammatory disease involving immune cells with macrophages as key agents in the disease progression by secreting cytokines such as tumor necrosis factor (TNF)-α, interleukin (IL)-6 and IL-10. Dietary bioactive components are being studied for their beneficial properties. Wheat germ oil (WGO) is rich in omega-3 fatty acids and vitamin E which have been reported to have anti-inflammatory property. The present study investigated the anti-inflammatory effects of four WGOs prepared using different extraction methods (WGO1, WGO2, WGO3 and WGO4) on cytokine production in lipopolysaccharide (LPS)-activated human monocytic (THP-1) cells. THP-1 cells were treated with low or high dose (0.25 and 1.5 x 10⁻³ %) of each WGOs in combination with LPS (1 µg/mL) for 6 h. None of the WGOs tested induced cell death or had negative effects on cell proliferation. All WGOs at both doses had no effect on IL-6 but high dose of WGO4 significantly decreased TNF-α (P<0.0021) production. Additionally, high dose WGO4 increased IL-10 production, an anti-inflammatory cytokine. These findings suggest that WGOs affect both pro- and anti-inflammatory cytokine and that the method of extraction influences its anti-inflammatory properties.

Effects of Folic Acid Deficiency on DNA Methylation, Stabilization and Cancer Susceptibility

Christina Jeffrey
Mercy College
Scholar Symposium Participant
Subject Area: Biomedical Sciences

The B vitamin Folic Acid is not synthesized within the body naturally. When this vitamin is not obtained by the body at the required level, the deficiency can result in chromosomal damage, mutation of the proto-oncogene and p53 gene, DNA stabilization and hypomethylation. Research done with laboratory rats and voluntary human participants, along with controlled splenectomy to view folate levels within the body showed a decrease in the synthesizing of the S-adenosylmethionine pathway, resulting in an increase in S-adenosylhomocysteine (homocysteine). Hepatic values show a decrease in SAM values from 29.60±3.47 to 4.40±0.01. This resulted in an increase of the SAH values from 20.47±2.08 to 35.47±11.28. Increases in DNA strand breakage due to folate deficiency using Uracil DNA Glycosylase was seen to increase from 31.9±6.7 to 80.9±11.7 during uracil misincorporation with increasing uracil values of 3,960,000±507,000 from normal 498,000±315,000 levels. These levels were seen to decrease from the alarming values with a controlled diet and supplementation of folic acid. Future experiments would be done to understand the damage that can be done while folate deficient.

Manufacturing process of low pressure tanks

Lance Jennings, Jamie Mouser, Efren Luevano
Oklahoma State University
MSE
Subject Area: Physical Sciences Technology

Natural gas vehicles are becoming more attractive in medium and lightweight duty applications and further development of this technology is vital to the success of the natural gas vehicles industry as a whole. A low-pressure, lightweight, liner-less, all composite absorbed natural gas tank system will allow for rapid
adsorption and desorption of natural gas to provide vehicles with enough gas to operate at full power. Carbon based adsorption materials were used to develop a mandrel that a composite tank could be filament wound to. Efforts were concentrated on preparing sorbent tooling materials based on isotropic carbon fibers and other sorbent additives materials followed by tooling preparation and prototype fabrication. This provided faster desorption rates and was used to overwrap composite materials that allowed for operation at lower pressures, yet still hold the same amount of fuel as CNG containers of the same size. The low pressure requirements will initiate the fabrication of ANG tanks from low-strength fibers and matrix systems, thus reducing costs in compressing the gas and manufacturing conformable vessels that do not have to be cylindrical in shape like their high-pressure counterparts.

**Defining the host range of the switchgrass rust fungus, Puccinia emaculata**

Brett Johnson, G. Orquera, C. Garzon, S. Marek

Oklahoma State University
Niblack Research Scholars
Subject Area: Biological Sciences

Puccinia emaculata, the fungal pathogen; causing rust of switchgrass, has an uncertain host range. Switchgrass (Panicum virgatum L.), is a perennial grass being developed as a potential feed stock for cellulosic ethanol production. In much of switchgrass’s geographic distribution, Puccinia emaculata is the most limiting disease.

The main objective of this study was to evaluate the susceptibility of twenty-one different plant accessions to P. emaculata. Plant responses to inoculations were recorded at 2, 3, and 5 weeks post-inoculation and scored using a semiquantitative disease scale. Spores were collected from symptomatic plant tissues at 3- and 5-week intervals. Infection by P. emaculata was confirmed by polymerase chain reaction (PCR). DNA extracted from spores and plant tissue were used as templates in PCRs, in which three primer sets; ITS-PuccF2 and ITS-Rust1, ITS1rust-F10D and ITS1rust-R3C as well as SGR-SP1-FW and SGR-SP1-RV were used to amplify DNA bands at regions increasingly specific to P. emaculata.

Leaf responses to inoculation indicate that two accessions of Panicum amarum, three accessions of Panicum virgatum, and one accession of Panicum trichantum were susceptible to P. emaculata and may act as hosts. This information could allow programs to focus on eliminating these plants in order to decrease rust inoculum reservoirs.

**Assessing the Relationship between Early Childhood Maltreatment and Empathy in Adults**


Oklahoma State University
Department of Psychology
Subject Area: Social Sciences

Substantial literature has examined subsequent psychological and interpersonal outcomes of childhood maltreatment; however, few studies have assessed maltreatment’s relation with personality characteristics. Thus far, childhood maltreatment has been linked to decreased levels of empathy (Locher et al., 2014; Main & George, 1985; Straker & Jacobson, 1981), although the exact nature of this relation is unclear. While some research has conceptualized empathy as a mechanism underlying outcomes of maltreatment, (Lesure-Lester, 2000) studies have yet to determine the characteristics of this relation. The present study examines the relation between maltreatment type and levels of empathy. Data will be collected from undergraduates at a large Midwestern university via online surveys including the Adverse Child Experiences Questionnaire (ACE-SF; Felitti et al., 1998) and the Empathy Quotient questionnaire (EQ; Baron-Cohen & Wheelwright, 2004). Students will be selected based upon self-identification of trauma exposure and will receive credit in exchange for their participation. This study will use an Analysis of Variance (ANOVA) statistical procedure to determine if empathy levels vary based upon maltreatment type. Findings will aid in awareness of the
impact early maltreatment has on empathy in adult individuals. Limitations and future directions of the study will be discussed.

**Stigma, Pluralistic Ignorance, and Attitudes Toward Seeking Mental Health Services Among Police Officers**

Kerry Karaffa, Julie Koch  
Oklahoma State University  
Counseling Psychology  
Subject Area: Social Sciences

Due to the stressors inherent in the police profession, officers may be at risk for a variety of personal and mental health-related concerns (Blum, 2000; Kates, 2008; Kirschman et al., 2013). Despite these tendencies, they have historically refrained from seeking professional mental health services (Greenstone, 2000). Several factors have been identified to explain their resistance, including stigma regarding mental health issues (Corrigan, 2004; Fair, 2009). In this study, 248 sworn police officers in Texas and Oklahoma completed a 62-item online survey related to their attitudes and willingness toward seeking mental health services, mental health stigma, and perceptions of other officers’ willingness to seek services. The results indicated that public stigma and self-stigma were negatively correlated with attitudes toward seeking professional psychological help. Furthermore, self-stigma fully mediated the relationship between public stigma and attitudes toward seeking help, and the model explained 56% of the variance in attitude scores. The results also suggested that officers underestimated their colleagues’ willingness to seek mental health services for several common presenting issues. In other words, police officers tended to believe that their peers were less willing to seek mental health services than they actually were.

**Rekindling Participatory Design**

Kate Kennedy  
Oklahoma State University  
Department of Design Housing & Merchandising  
Subject Area: Humanities

Participatory design is an idea that was conceived in the 1970’s in Scandinavia. The goal is to include all stakeholders in each step of the design process. Such stakeholders include designers, clients, users, the community, and others. Users are especially valuable stakeholders when it comes to designing for the public. Participatory design has certain methods that strengthen the bonds between the stakeholders, such as workshops, ethnography, cooperative prototyping, mock-ups, card sorting, user design and more. The results of these methods produce designs that can be used to the full benefit of every stakeholder. Until recently, participatory design had not been relooked at since its original conception. What is being discovered is that the traditional idea is no longer relevant to the quickly advancing society we live in today. Therefore, participatory design needs to be rekindled and revamped to better support the current lifestyle of the public. This study investigated how participatory design is changing and evolving to support contemporary design. The objectives were to identify issues and misconceptions that are limiting the design process and to examine effective participatory design approaches to solve contemporary complex design problems.

**Martian Greenhouse Design for eXploration HABitat**

Geoff Kibble  
Oklahoma State University  
Department of Mechanical and Aerospace Engineering  
Subject Area: Physical Sciences Technology

Long duration space missions to Mars offer many significant hurdles and sustainability is one of leading logistical considerations. In order to put a successful long duration presence on the Martian surface, the
mission must incorporate self-sufficient means of producing food. Therefore, Oklahoma State University is investigating various means of producing food on Mars and has been selected to compete in the NASA’s 2015 eXploration Habitat (X-Hab) Academic Innovation Challenge. The OSU team includes students from MAE, BAE, ECE and ARCH and is analyzing possible designs to narrow down the most feasible and useful concept. After detailed analysis, the team will produce an Earth analog as proof of concept. Our design incorporates a solid central structure integrated with inflatable soft goods to maximize plant growth area while reducing total mass and packed volume. With this approach, deployment and structure design are driven by plant growth requirements and minimizing necessary crew interaction. This design will allow astronauts to supplement fresh foods in their diet. Without a feasible means of sustainability, a human mission to Mars will continue to be a science fiction and food production is a key component needed to design a successful mission to Mars.

Post-merger Executive Retention: Analyzing Positional-based Antecedents

Joe Kim
Oklahoma State University
Department of Management
Subject Area: Social Sciences

The literature on corporate governance has paid significant attention to the leadership structure at the upper echelon of the organizations. This is because members of the upper echelon in different governance positions may have different resources, leading to different influences on organizational outcomes (Jensen & Zajac, 2004). That is, different leadership positions are appointed with divergent and unique responsibilities and executives develop human capital specific to the executive positions serving as distinct resources of the firm. Thus, we use governance position as an indicator of heterogeneous resources of TMTs. I draw from resource based view (RBV) and resource dependent theory (RDT) to argue that those executives in certain governance position will more likely be retained because they are valuable resources that contribute to improved post-merger competitive advantage. Thereby, this research examines the effects of government positions and retention of executives after a merger.

Culture and Reciprocity: Different patterns of escalation in giving and taking behaviors

YUN KIM, Cynthia Wang
Oklahoma State University
Management/Business/Ph.D.
Subject Area: Social Sciences

One basic mechanism that governs social exchange is a norm of reciprocity. Although extant research has primarily investigated economic exchange, different patterns of reciprocity in social exchange have been received scant attention. Indeed, given individuals’ behaviors in everyday social exchange may be heavily influenced by the cultural environment that they belong, it is important for us to understand the cross-cultural differences in patterns of reciprocation. In this study, a behavioral economic framework was employed to investigate the cross-cultural differences in giving and taking behaviors. Undergraduate students from the United States and Singapore took part in four rounds of giving and taking games. The study design is 2 (Culture: US vs. Singapore) x 2 (Type of Game: Giving vs. Taking) x 4 (Rounds: Round 1 to 4) mixed design analysis of variance (ANOVA) with the variable “rounds” as a within factor. The findings revealed that there were different patterns of giving and taking; Americans tend to escalate giving behaviors while Singaporeans tend to escalate taking behaviors.
CHARACTERIZATION OF DEVELOPMENTAL GENE EXPRESSION IN A DICTYOSTELIUM MUTANT LACKING ERK1 AND REGA

Troy King, David Schwebs, Dr. Jeffrey Hadwiger
Oklahoma State University
Microbial Genetics
Subject Area: Biological Sciences

In this project, we wanted to observe if a mutant lacking the ERK1 and RegA gene has any changes in developmental gene expression because ERK1 and RegA play a central role in development signaling. Our goal is to compare mutant gene expression with wild-type gene expression at different stages of development. We hypothesize that developmental gene expression might be accelerated since this mutant develops faster than wild-type cells. We used reporter genes containing the lacZ gene to examine the timing and distribution of developmental gene expression. We examined the expression of these genes by staining for the expression of b-galactosidase. The expression of the prestalk specific reporter gene ecmA:lacZ (vector p91) in erk1-regA- cells was detected in the anterior region of developing aggregates and that distribution is similar to that observed for wild-type cells. The level of this gene expression was enhanced when erk1-regA- cells were developed in chimeric aggregates that contained an excess of wild-type cells suggesting that erk1-regA- cells are deficient in producing an extracellular signal that induces ecmA gene expression.

Citizen Science and Socio-Economic Factors: Using ecological niche modeling to predict who is most likely to participate.

Ashley Knoch, Kristen Baum
Oklahoma State University
Integrative Biology
Subject Area: Biological Sciences

Citizen science provides a unique, irreplaceable tool for ecologists researching phenomena at large spatial scales. Citizen science participation is increasing globally, but especially in the U.S. Ecological niche modeling is commonly used to identify areas that may be suitable for a species to live through identifying environmental variables that are of highest importance to their survival. I used the modeling program MaxEnt to determine what socio-economic factors have the highest correlations with citizen science participation. Socio-economic factors used in this study include: population density, urban land cover, and crop landcover. Occurrence points were latitude and longitude locations from where citizen scientists made observations for the Monarch Larva Monitoring Program. Urban land cover was the greatest contributing factor, followed by population density and crop cover. Areas that contained the best-predicted conditions overlapped highly with metropolitan locations. It may be that citizen scientists are living in urbanized areas but are lower in population density than the city (e.g. suburbs). Suburban residents in general may have more contact with science outreach than those in rural communities. Understanding how socio-economic backgrounds influence citizen science participation will increase awareness of where science outreach should focus in order to increase public knowledge of scientific issues.
Gender Matters: The (dis)advantages of drag performance in Oklahoma

Douglas Knutson, Julie Koch, PhD
Oklahoma State University
School of Applied Health and Educational Psychology
Subject Area: Social Sciences

Gender scholars have forwarded many theories exploring drag queens and gender construction (Horowitz, 2013; Taylor & Rupp, 2004). Researchers have examined benefits and drawbacks of drag performance (Berkowitz and Belgrave, 2010; Hopkins 2004). Until recently, drag performance was largely stigmatized (Meyerowitz, 2002). Little research has addressed gender identity among drag queens.

This single case study sought to address the question: “How do drag queens define gender for themselves?” Methods involved conducting a 45 minute, semi-structured pilot interview with one white, male participant. The interview was transcribed and coded for themes through Consensual Qualitative Research methodology (Hill, 2012).

Results validate other findings that drag may be used to declare personhood (Markwell & Waitt, 2009) and to generate a sort of celebrity status (Berkowitz et al., 2007). New themes surfaced with this participant who reported a strong male identity and described using drag as therapy.

Implications for future study of drag queens and for gender nonconforming populations are addressed. In short, drag performance may contribute to mental health and drag queens may possess a strong sense of maleness. Further study of gender identity among drag queens may provide clearer and more positive approaches to gender among mental health professionals and gender theorists.

Information coding with Optical Standing Wave at Dancing Phases

Wakun Lam, Siamak Dadras, Jiating Ni, Sandro Wimberger, Gil Summy
Oklahoma State University
Department of Physics
Subject Area: Physical Sciences Technology

We show that the quantum accelerator mode (QAM) could be achieved by precisely controlled phase modulation of an optical potential. By carefully choosing the sequence of the modulated phase, we could manipulate the QAM to a certain resonance mode without controlling the relative acceleration of the standing wave, which provides a model to understand the origin of the QAM. In addition, we numerically calculate the dynamical phase diagram based on the area of QAM modes under the influence of different schemes of modulated phase. Our result suggests an experimental direction to test the phase-modulate QAM.

Molecular Epidemiology and Study of Viruses Contributing to Bovine Respiratory Disease

Casey Landis
Oklahoma State University
Biochemistry/Vet Pathobiology
Subject Area: Biological Sciences

Bovine respiratory disease (BRD) is one of the most damaging diseases to affect the beef cattle industry through the cost of treatment and the losses from morbidity and mortality. BRD affects both the upper and lower respiratory tracts and has symptoms including fever, coughing, eye and nasal discharge, and loss of appetite. Different viruses can contribute to BRD including bovine viral diarrhea virus (BVD), bovine respiratory syncytial virus (BRSV), bovine coronavirus (BCV), and parainfluenza 3 virus (PI3V). The experimental approach includes performing RNA extraction, reverse transcriptase enzyme reaction, and polymerase chain reaction. The amplified nucleic acid segments are then visualized with agarose gel electrophoresis and compared to positive viral controls. This process was executed using samples from cattle.
with BRD symptoms, or that had been exposed to BRD. Thus far positive results for BCV and PI3 have been acquired from nasal swabs. The BCV samples were from an experimental feedlot containing comingled auction and ranch bought beef calves. The PI3 samples were from a research feedlot containing calves persistently infected with BVD. Both sets prove that molecular testing is an effective method for identifying viruses present in samples and yields quick and accurate results.

**Socio-cultural factors affecting sun-seeking behavior for infants living in urban or rural communities in southern Ethiopia**

Riley Larson, Meron Girma, Barbara J. Stoecker

Oklahoma State University
Human Sciences

Subject Area: Humanities

Ethiopians depend on sunlight for vitamin D synthesis due to limited dietary sources. This qualitative study investigated sociocultural factors affecting sun exposure for infants of women from three categories: initial pregnancies, mothers of infants <1 y, and grandmothers. Eighteen focus groups with ≈10 participants each were held in three urban and three rural communities. In-depth interviews were conducted with local health extension workers (HEWs). Reports from grandmothers indicated that awareness of benefits of sun exposure for infants has increased in the last generation. Mothers currently stay indoors after delivery for ≧45 days in rural and ≧15 days in urban areas. Women stated that 15-30 minutes of morning sunlight, never afternoon sun, was best for infant health. Barriers mentioned were skin irritation, eye problems, catching cold from drafts, and fear of the evil eye. Only 2/82 rural and 26/88 urban women freely associated sunlight with vitamin D. HEWs provided health information for 96% of rural and 88% of urban women. Variable understanding of the importance of sun exposure and of sources of vitamin D indicated disparities in knowledge transfer. Our data support additional training of both rural and urban HEWs and mothers regarding benefits of sun exposure for infants.

**The Correlation between Time Management and Stress in College Students**

Anne Solange Leveille, Anne Solange Leveille

Mercy College
Scholar Symposium Participant

Subject Area: Social Sciences

Every student in college complains about daily difficulties that cause nervousness or discomfort, which is called stress today. It is possible that one strategy that can combat stress is time management. The following study will explore the interrelationship between time management and stress for both males and females. In the first part of the study, one hundred students from various majors (50 females and 50 males) at Mercy College, varying in age and year in school, will complete a questionnaire to identify what they consider to be the major sources of stress for college students. The questionnaire will contain different stressful scenarios including academics, environment, and interpersonal situations. In the second part of the research, I will interview 10 male and 10 female students to investigate the management of their time. I hypothesize that there will be significant differences in time management behavior, based on gender and year in school. Females will experience more stress than the males. Freshmen will have a greater reaction to stress than seniors. Based on the results of this study, recommendations for change could be made in the education system of Mercy College in order to reduce stress among the students.
Analysis of the Viability of Microalgae Cultivation for Phycoremediation and Bioenergy Production

Christian Ley, Sheyda Chamaki, Dr. Nurhan T. Dunford
Oklahoma State University
CASNR /CEAT
Subject Area: Biological Sciences

The union of phycoremediation and bioenergy development has the potential to address several environmental issues in one integrated system. A microalgae cultivation system can serve a dual purpose: to act as a wastewater remediation system and to produce biomass which can be used for bioenergy production. An Oklahoma native microalgae strain, SP 23, is being grown in a photobioreactor installed in a greenhouse. Animal waste water is used as the growth medium after passing it through a sand filter and sanitizing. The cell growth is currently being analyzed by measuring the pH, cell density, and absorbance of the medium. The cells will be harvested when they reach the stationary phase of their growth. The harvested biomass will be analyzed for its oil, protein and ash contents. Water recovered from biomass harvest will be analyzed to determine nitrogen, phosphorous and mineral removal and COD and BOD reduction in waste water during algae growth. The success of this experiment will be based on the effectiveness of the animal waste water remediation and the quality and amount of the biomass production. Ultimately, the results of this experiment may yield a more efficient process to treat wastewater while producing a renewable source of energy.

Bounding Box based Image Segmentation Technique for Pavement Crack Classification and Severity Measurement Using 3D Laser Data

LIN Li, Kelvin.c.p. wang, Joshua Q. Li
Oklahoma State University
School of Civil and Environmental Engineering
Subject Area: Physical Sciences Technology

Accurate pavement crack classification is critical for pavement distress condition rating and the subsequent maintenance, design, and rehabilitation activities. Substantial research and field efforts have been dedicated to developing a usable solution for fully automated crack classification, but successful field applications are very limited since the proposed techniques and processing so far have several common deficiencies. One of the deficiencies is the incapability of separating the simply connected crack into proper types. To overcome this and other limitations, this paper presents a four-phase bounding box based image segmentation technique for fully automated crack classification based on a classification protocol used at a state DOT. Firstly pavement 3D surface data are continuously collected at high speeds using the emerging 1mm 3D PaveVision3D Ultra technology, based on which cracks are identified with the multi-seed fusion algorithm. Subsequently a series of image processing techniques (e.g. morphological techniques and thinning operations) are introduced to produce terminal bounding boxes in combination with location references of wheel path and lane marking. Finally crack classification and severity measurement are conducted on the terminal bounding boxes. The case study demonstrates that automated results for crack classification using the proposed technique compare well with these from manual processing.

How parenting strategies vary by momentary parenting goals

Hua Lin
Oklahoma State University
Human Science
Subject Area: Humanities

Darling and Steinberg’s (1993) Integrative Parenting Style Model indicated that broad parental socialization goals influence parenting practices. However, the Integrative Parenting style model did not address specific parenting goals in a particular disciplinary situation, which could change from one episode to another. Present study extend Darling and Steinberg’s Integrative Parenting Style model beyond the macro level to the micro level through investigating parenting in 5 specific disciplinary episodes, which describes the
relationship between momentary parenting goals and parenting strategies. Participants included a convenience sample of 105 mothers and their 18- to 30-month-old toddlers pairs. Qualified mothers and toddlers had a first interview and then a second interview through telephone 24 hours later, each interview giving detailed reports about the most difficult discipline episode, a potentially problematic episode and the phone call interview giving reports about an cleanup episode that occurred during the initial interview session. **Result:** When parents uses physical power assertion, give in and ignore discipline strategies, they more want the child to stop the non-compliance presently. When parents chose the discipline strategies of Spanking, Time out, or Privilege Removal, they indicate more willing of their child's obeisance.

**Synthesis of Enaminones using Copper as a Catalyst**

**Erika Lopez Quiroz, Syed R. Hussaini**  
*The University of Tulsa*  
*Department of Chemistry*  
*Subject Area: Physical Sciences Technology*

Enaminones are synthetic intermediates in organic synthesis that contain the N-C=C-C=O functional group. These compounds are useful in the development of pharmaceuticals. Although the biological activity of enaminones is not well-documented, enaminones have currently come under investigation because of their therapeutic potential. Recently, our research group has found a ruthenium catalyzed method for the synthesis of enaminones that requires ruthenium for catalysis. This project uses a copper catalyzed method for the synthesis of enaminones. Copper (II) Bromide was investigated for the coupling of a diverse group of thioamides (1) and diazo compounds (2). Temperature and time were screened and the catalyst was found to give 100% conversion of several thioamides into the corresponding enaminones (3) at 90 °C using dicholoroethane as a solvent. Copper (II) Bromide shows a broad scope in the synthesis of enaminones. By using a copper catalyzed method, the reaction has become more economical.

![Chemical structure](image)

**Fracking Research**

**Efren Luevano, Efren Luevano**  
*Oklahoma State University*  
*Department of Material Science*  
*Subject Area: Physical Sciences Technology*

With the increasing demand for petroleum have led oil companies to a revolutionary method for extracting oil from shale rock bed and other oil pools. Even though hydraulic fracturing (fracking) was first developed in 1865, not much is known about the behavior that this induces on earth’s rock crack propagation that allows for a more efficient oil extraction technique. A collaboration between three Oklahoma State University departments have taken on the task to research of exactly how rock fractures or how much permeability there is thousands of feet below sea level. Within this research a testing method that involves fracturing fiber reinforced concrete core samples in a controlled lab environment was created. This lab environment is composed of a pressuring chamber where the concrete sample are to be safely cracked to collect permeation data. Current testing shows that testing up 10,000 psi can be safely conducted; which will allow for significant advancement on this research.
The performance of pediatric practices in the south east u.s. before and after the implementation of the affordable care act

Marquita Mallory, Dr. Borris Abbey
Fayetteville State University
Scholar Symposium Participant
Subject Area: Education

The Affordable Care Act (ACA) was passed into law in 2010 with the intent to ensure that all US citizens can obtain and afford healthcare insurance. The ACA has expanded healthcare coverage yet some claim that it has produced a negative effect on the financial performance of medical practices. The objective of this study is to examine the effects of the ACA on the financial performance of medical practices. Specifically, this study will examine financial statements from nine pediatric practices located in North Carolina in order to determine whether the ACA has a negative effect on the performance of these pediatric practices. To address financial performance, an analysis of financial statements two years before the adoption of the ACA, and financial statements up to the present time, will be examined to determine whether the ACA negatively effects financial performance. In conclusion, this study will provide quantitative results that directly address one of the main concerns arising from the implementation of the ACA.

Diabetes Alters the Regulation of Insulin Sensitive Glucose Transporters 4 and 8 in the Atria

Zahra Maria, Emilie Martinez, Brenda Smith, Veronique Lacombe
Oklahoma State University
Physiological Sciences
Subject Area: Biomedical Sciences

The heart is one of the main organs to utilize glucose; however, little is known about glucose metabolism in the atria. Glucose transport into the cell via Glucose Transporters (GLUTs) is the rate-limiting step of glucose utilization. Although GLUT4 is the major isoform, GLUT8 has emerged as a novel cardiac isoform. We hypothesized that GLUT-4 and -8 translocation to atrial cell surface will be insulin sensitive and impaired during diabetes. GLUT protein content was measured in healthy and type-1 (streptozotocin-induced, T1Dx) and type-2 (high fat diet-induced, T2Dx) diabetic rodents. Active cell surface GLUT was measured using a biotinylated photolabeled technique. Insulin stimulation increased cell surface GLUT translocation in healthy atria (P<0.05). Further, insulin stimulated Akt phosphorylation (th308 and s473 sites), suggesting that Akt regulates atrial GLUT trafficking. During diabetes, atrial cell surface GLUT was down-regulated (P<0.05). Cell surface GLUT in the atria was negatively (P<0.05) correlated with blood glucose concentration. Our data suggested that: 1) GLUT-4 and -8 are insulin sensitive in the atria; 2) similar to ventricle, GLUT-4 and -8 translocation is impaired in the diabetic atria. Alterations in atrial glucose transport may induce perturbations in energy production and provide a metabolic substrate for atrial fibrillation during diabetes.

Effects of LPS and FSH on bovine granulosa steroid production

Julia Matera
Oklahoma State University
Department of Animal Science
Subject Area: Biological Sciences

Biosynthesis of steroids is an important function of the ovary. These steroids are essential to numerous physiological functions including the establishment and maintenance of pregnancy. Studies have shown that the WNT/CTNNB1 pathway is a critical component to the regulation of ovary steroidogenesis. Data has also suggested that the pituitary hormones, luteinizing hormone (LH) and follicle stimulating hormone (FSH) interact with this signaling pathway. Additionally, previous studies have noted a lack of fertility in
dairy cattle that suffered recent infection. Residual lipopolysaccharides (LPS) from the bacteria of the infection may have been a contributing factor to ovarian dysfunction and altered steroid production. This study evaluated the effects of LPS and FSH treatments on bovine granulosa cell steroid production. Our investigations used granulosa cells from bovine ovaries cultured in minimal essential media (MEM) supplemented with fetal bovine serum (FBS). Cells were then treated with serum free media containing LPS and FSH for 24 hr. Protein was extracted for Western Blot analysis. Results indicated that FSH signaling pathway remained unchanged after LPS treatment.

Social Correlates of Academic Adjustment and Performance: The Role of Social Achievement Goals and Need Satisfaction for Relatedness

Amanda McCabe, Yoonjung Cho
Oklahoma State University
School of Applied Health and Educational Psychology
Subject Area: Education

Building on prior research focusing on the role of social content goals (i.e., responsibility vs. intimacy goals), the purpose of this study is to extend previous research by examining the independent and joint roles of social achievement goals (defined as different orientation toward social competence) and need satisfaction for relatedness (defined as the extent to which needs for social relationship is fulfilled) in facilitating academic adjustment and achievement. A total of 166 college students enrolled in an introduction to communication course at a comprehensive university in the Northwest United States participated in the current study. Hierarchical multiple regression analyses was used to examine independent and interactive effects of college students’ need satisfaction for relatedness and social goals on their academic adjustment and performance. This study revealed that need satisfaction for relatedness is associated with enhanced academic self-efficacy only when students endorse a high level of social development goals, whereas positive association between these two variables did not exist among students with low endorsement of social development goals. The results of the current study revealed that both social achievement goals and need satisfaction for relatedness make an independent and unique contribution to explaining academic-related outcomes.

Fracture Architecture in the High Plains Aquifer, Northeastern Texas Panhandle: Implications for Geologic Storage of Carbon Dioxide

Jingyao Meng, Jack Pashin
Oklahoma State University
School of Geology
Subject Area: Physical Sciences Technology

Aquifer protection is a central imperative of underground injection control in the United States, and so understanding aquifer architecture is an important part of environmental protection in areas favorable for subsurface storage of carbon dioxide.

The High Plains Aquifer of the northeastern Texas Panhandle includes loess-like sandstone of the Ogallala Formation and Quaternary strata that include sand, clay, chert, and caliche. Target formations for CO2 storage and enhanced oil recovery are in Pennsylvanian sandstone deeper than 2,000 m in this area. Field study reveals that the Miocene-Quaternary formations contain numerous joints that provide insight into aquifer architecture and subsurface flow pathways.

Length, orientation, spacing, and cross-cutting relationships of more than 1,700 joints were measured in the field and in high-resolution satellite imagery. The fracture networks consist of well-developed systematic joints and cross-joints. Systematic joints are strongly aligned and have length that commonly exceeds 60 m. Cross-joints tend to terminate at systematic joints, and so joint length is typically equal to systematic joint spacing (~2 m). In vertical section, the joints are typically curvilinear and strata-bound, cutting indurated sandstone and chert and terminating within friable sandstone. Analysis of joint indicates that the strike of the systematic joints varies among beds and regionally. Fracture azimuths are strongly clustered in western
siliceous caprock area, showing the vector mean azimuths as 67° and 146°. Whereas the azimuths in eastern Ogallala are less clustered with vector mean azimuths of 52° and 126°. Spacing analysis indicates that the joint spacing in the study area follows the lognormal spacing rule. These fractures may be the product of modern stress regimes in Texas Panhandle and may have a significant effect on flow in the High Plains aquifer system.

**Comparative Dynamics of Perching in Several Bird Species for the Development of Autonomous Perching Maneuvers**

Jonathan Mitchell, Michael Puopolo, Jamey D. Jacob  
Oklahoma State University  
Department of Mechanical and Aerospace Engineering  
Subject Area: Biological Sciences

One characteristic of biological flight that has proven elusive to fixed-wing aircraft is the ability to perch, i.e. alight on a branch or ledge. A small UAV capable of perching could perform a perch-and-recharge technique if equipped with solar panels for extended range. In addition, surveillance UAV could perch-and-stare for increased capabilities, a technique already employed by rotary-winged UAVs. This paper examines the dynamics of perching techniques in several species of birds. More specifically, the approach trajectory, velocity, and pitch as well as wing and tail movement are analyzed using photogrammetric techniques and software. The information acquired from avian flights will be compared with an aerodynamic model to determine its accuracy in predicting avian perching maneuvers.

**Athlete's Heart: A Meta-Analysis of Physiological Left Ventricle Remodeling**

Taylor Monaghan  
Oklahoma State University  
Health & Human Performance  
Subject Area: Biological Sciences

Elite athletes training at vigorous levels for long periods of time experience cardiovascular morphological changes due to the various extreme stressors exercise presents. Known as athlete’s heart, physiological adaptations are well documented including a dilated left ventricle (LV) and an increase in LV wall thickness. Conversely, what happens after an athlete discontinues training is less understood. These adaptations mimic many cardiovascular diseases, such as hypertrophic cardiomyopathy and dilated cardiomyopathy. This meta-analysis focuses on published longitudinal studies documenting athletes’ cardiovascular changes from a trained to detrained state. Athletes must have been detrained for at least 6 weeks and echocardiographic results must have been documented for inclusion. Five studies, totaling 74 subjects, are presented. Four studies revealed significant decreases in LV posterior wall thickness and interventricular septal wall thickness and two studies declared significant decreases in left ventricle end-diastolic internal diameter. However, after these numbers were compared to a non-athlete population a regression rather than a complete reversal was recognized. While athlete’s heart is thought to be benign, the resemblance to cardiac disorders along with incomplete LV remodeling and the lack of long-term data provides a critical area in need of further study.
Evaluating EPA's 2013 Recommended Procedures for Developing Emissions Factors

Thomas Moore, M.D. Buser, D.P. Whitelock, J.D. Wanjura, D.W. Hamilton

Oklahoma State University
Biosystems and Agricultural Engineering
Subject Area: Physical Sciences Technology

In August 2013, EPA published new methodologies for updating AP-42 emission factors. Our objectives were to determine the appropriate basic unit of calculation (test) and how this unit affects Composite Test Rating (CTR) and Factor Quality Index (FQI) as defined in this methodology. Published total particulate matter data from the Characterization of Cotton Gin Particulate Matter Emissions Study was used to complete the evaluation. Individual Test Ratings (ITRs) were assigned to individual test runs and sorted descendingly. These ITRs were grouped by test to calculate CTR and FQI (measure of representativeness). Three basic units of calculation (tests) were considered: individual test run (Design 3), individual test run average for a specific sampling method and specific facility (Design 2), and individual test run average for a specific facility (Design 1). Results showed that Design 3 falsely increased representativeness because the basic units of calculation were repeated measures. Design 1 reduced representativeness and produced an opportunity where hundreds of test runs could be falsely rejected. Design 2 was the best approach, as it accounts for year to year variation, screens out unrepresentative data without removing large amounts of data, and avoids overestimation of the representativeness of the emission factor.

The influence of temperature regimes on otolith daily ring deposition in smallmouth bass (Micropterus dolomieu)

Joshua Mouser, Nicole Farless, James Long, Shannon Brewer

Oklahoma State University
Niblack Research Scholar
Subject Area: Biological Sciences

Fisheries managers use otoliths to determine the daily age of young fish and little is known about the influence of biotic and abiotic factors (e.g., temperature, photoperiod, and feeding) on ring deposition. The objective of this study was to determine the influence of temperature regimes on the deposition of daily growth rings in smallmouth bass (Micropterus dolomieu) otoliths and determine an efficient method for marking otoliths. To determine if temperature influenced the accuracy of aging fish using daily growth rings, we first marked fish using oxytetracycline and placed fish into four treatment groups: two temperature treatments (n=10; maximum temperature of 27°C and 32°C) and two control groups (n=5; held at 20°C and 25°C). Each temperature-treatment group began at an acclimation temperature and increased by 0.5°C daily until reaching the maximum temperature and was held at that temperature for four weeks. Results indicated oxytetracycline did not leave a ring on any otoliths in any treatment. The next experiment will use varying concentrations of alizarin red S (100mg/L, 200mg/L, 300mg/L, and 400mg/L) to determine if this method will leave a mark on the otoliths. Future work will repeat the temperature study using a valid marking technique.
Illness Intrusiveness, Illness Uncertainty, and Anxiety in College Students with a Chronic Illness


Oklahoma State University
Department of Psychology
Subject Area: Social Sciences

Objective: The current study aimed to examine the relationships of both Illness Intrusiveness (II) and Illness Uncertainty (IU) to anxiety in college students with a chronic illness.

Methods: Participants were 563 students with a self-reported chronic illness (e.g., asthma, diabetes) (Mage = 19.6 years; SD=2.58). Participants completed a battery of questionnaires assessing II, IU, and anxiety as part of a larger online study.

Results: Hierarchical multiple regression was used to assess the degree to which IU and II predicted anxiety, after controlling for self-reported disease severity and symptom manageability. Disease severity and symptom manageability were entered on Step 1, explaining 4.2% of the variance in anxiety. II and IU were entered on Step 2 explaining 31.2% of the overall model variance (F(4, 306)=34.75, p<.001) indicating an additional 27%, F change. (F(2, 306)=60.12, p<.001). In the final model, only the two illness distress measures were statistically significant, with II evidencing a higher beta value (β =-.40, p<.001) than IU (β =.25, p<.001).

Conclusion: II and IU both predicted increased anxiety scores, with II having a greater impact than IU. Consequently, interventions aimed at lessening illness-related psychosocial distress during the college transition could be beneficial in reducing anxiety levels in this population.

Effect of a polymorphism in the LDHB gene on beef color stability

Jessica Neal, Justin Buchanan, Dr. Raluca Mateescu

Oklahoma State University
Department of Animal Science
Subject Area: Biological Sciences

The lactate dehydrogenase B gene (LDHB) encodes a subunit of an enzyme that catalyzes the interconversion of muscle lactate and pyruvate and may potentially influence meat color stability. Meat color is vital in customer preference of retail beef cuts, and losses of $1 billion annually can be attributed to discolored products. This experiment was created to evaluate the influence of an identified polymorphism in the LDHB gene on beef color stability. A population of 156 beef cattle was harvested, and steaks from these animals were evaluated to determine the a* value of the steaks after 156 hours of aging. Real time polymerase chain reaction (RT-PCR) and High Resolution Melt curve analysis were run on extracted DNA to genotype the cattle. A regression analysis, using the GLM procedure in SAS, was used to test the association between the new SNP and the beef color stability. The homozygote (AA) and heterozygote (AB) groups had color stability means for a* of 11.2 and 14.2 respectively (P=0.07). Because of this difference in phenotype, this SNP in LDHB has the potential to be used as a genetic marker to select for cattle that produce steaks with higher color stabilities.

In Vitro Model For Mimicking Concussion Impacts On Sterile Cell Culture

Nadir Nibras, Michael Glover, Sundararajan Madhally

Oklahoma State University
Department of Mechanical and Aerospace Engineering
Subject Area: Biomedical Sciences

Recently, understanding long-term effects of concussion has garnered significant interests. However, there is a lack of simple in vitro models that could facilitate understanding the impact on neural cells. The goal of
the project was to develop an *in vitro* model for analyzing the effects of concussions in cell culture. First the device was designed using modeling software. It was then fabricated using a sturdy structure to support a pendulum-like swing-hammer that would generate impacts on a rotating arm, causing angular accelerations required to cause concussion. The device was converted to a mechatronics system to reduce the effect of human error on the experiment. A compartment to tightly hold the petri dish was attached to the side of the rotating-arm on the side opposite to that where the swing-hammer would impact. Hydrogel with properties similar to brain tissue was layered into petri dishes. Using the mechatronics system the acceleration of the hydrogel was calculated upon impact. The maximum rotational accelerations calculated were in the range of angular accelerations that are known to cause concussions to the head. In summary, the device can successfully mimic concussion impact forces on in a controlled, sterile environment and provides a way to study concussions.

**Sociability tendencies in cricket frogs show resemblance to those of higher vertebrates**

*Sierra Nollen, Lynne Beaty, Barney Luttbeg*

**Oklahoma State University**
**Integrative Biology**
**Subject Area: Biological Sciences**

Every individual has a social history. Many organisms socialize with members of same species, whether it be with parents, siblings, or acquaintances. Individuals in the wild rely on conspecific learning and group behavior to find food, mates, and other vital resources. Observing social behavior between different life stages and genders of cricket frogs (*Acris blanchardi*), we were able to determine which conspecifics they preferred (e.g., familiar, unfamiliar, juvenile, etc.) and how long it took for individuals to make a final decision. If the individual being observed only prefers to associate with a certain group of frogs, this could mean it is utilizing mate choice or learned behavior. We were able to see individual and group preferences in cricket frogs that reflect the tendencies of higher vertebrates. We found that females make decisions slower than males and juveniles, most likely due to their need to remain available to reproduce. The males chose a final destination faster since not as many males are needed in the wild for reproduction.

**Bilingualism: The Repercussions of Being Denied the Spanish Language and the Significance of its Preservation**

*Rosa Palacio*

**Wichita State University**
**Scholar Symposium Participant**
**Subject Area: Social Sciences**

Constant turmoil over Bilingualism and the use of the Spanish language appears never ending. Spanish language education has existed in America since the European Spaniards arrived in the 1600’s (MacDonald 307). The United States, while expanding territory and establishing its own identity, exacerbated tensions between Spanish and English language education—tensions that continue today. But what happens to the Spanish speaking American citizen when he or she is forced to adapt to a foreign language and forget his or her own? The denial of the Mother Tongue, in this instance Spanish, has far reaching effects, such as cultural alienation and structural immobility (Faruggio 7). This study seeks to emphasize the effects of losing one’s native language by drawing links between the history of Spanish in the U.S., the increased population of Latino Americans, and the ongoing controversies of Bilingual education. One of the most distinctive qualities of a culture is its language, and losing a language results in the interruption of one’s cultural identity; hence, one’s sense of being.
RELIABILITY OF PORTABLE STRENGTH TESTING FOR ASSESSING MAXIMAL AND RAPID ISOMETRIC TORQUE CHARACTERISTICS IN FRAIL, VERY OLD ADULTS

Ty Palmer, Ryan M. Thiele, Eric C. Conchola, and Douglas B. Smith

Oklahoma State University
Health & Human Performance
Subject Area: Biomedical Sciences

PURPOSE: To determine the reliability for maximal and rapid isometric torque characteristics of the leg extensors and flexors in frail, very old adults using portable strength testing. METHODS: Fifteen frail, very old adults volunteered for this investigation on 2 non-consecutive days. During each visit, participants performed 2 isometric maximal voluntary contractions (MVCs) of the leg extensors and flexors. Participants were instructed during each MVC to push or pull “as hard and fast as possible” for 3-4 s. Isometric MVC peak torque (PT) was determined as the highest mean 500 ms epoch during the entire 3-4 s MVC plateau. Rate of torque development (RTD) was determined from the linear slope of the torque-time curve over the time intervals of 0-30, 0-50, 0-100, 0-200, and 100-200 ms. RESULTS: Repeated measures ANOVAs indicated no systematic variability ($P>0.05$). The ICCs and SEM values expressed as a percentage of the mean ranged from 0.504-0.847 and 23.619-55.189% for the leg extensors and 0.716-0.826 and 15.408-32.356% for the leg flexors, respectively (Table 1). CONCLUSION: These findings demonstrate that portable strength testing may be a reliable assessment technique for measuring maximal and later (>100ms) rapid torque characteristics of the leg extensors and flexors in frail, very old adults.

Table 1. Reliability statistics for peak torque (PT) and rate of torque development (RTD) over the time intervals of 0-30, 0-50, 0-100, 0-200, and 100-200 ms for the leg extensors and flexors.

<table>
<thead>
<tr>
<th></th>
<th>PT (0.504-0.847)</th>
<th>0-30 (23.619-55.189)</th>
<th>0-50 (23.619-55.189)</th>
<th>0-100 (11.380-32.356)</th>
<th>0-200 (11.380-32.356)</th>
<th>100-200 (11.380-32.356)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leg Extensors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-value</td>
<td>0.729</td>
<td>0.265</td>
<td>0.348</td>
<td>0.399</td>
<td>0.202</td>
<td>0.389</td>
</tr>
<tr>
<td>ICC$_{2,1}$</td>
<td>0.847</td>
<td>0.550</td>
<td>0.504</td>
<td>0.560</td>
<td>0.752</td>
<td>0.786</td>
</tr>
<tr>
<td>SEM</td>
<td>11.380</td>
<td>102.253</td>
<td>112.455</td>
<td>90.480</td>
<td>33.087</td>
<td>30.493</td>
</tr>
<tr>
<td>SEM%</td>
<td>23.619</td>
<td>51.141</td>
<td>55.189</td>
<td>53.362</td>
<td>28.901</td>
<td>32.229</td>
</tr>
<tr>
<td><strong>Leg Flexors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-value</td>
<td>0.103</td>
<td>0.416</td>
<td>0.555</td>
<td>0.958</td>
<td>0.801</td>
<td>0.697</td>
</tr>
<tr>
<td>ICC$_{2,1}$</td>
<td>0.826</td>
<td>0.761</td>
<td>0.785</td>
<td>0.810</td>
<td>0.716</td>
<td>0.719</td>
</tr>
<tr>
<td>SEM</td>
<td>5.019</td>
<td>56.266</td>
<td>60.431</td>
<td>47.048</td>
<td>27.433</td>
<td>17.041</td>
</tr>
</tbody>
</table>

$P$-value = type I error rate for the one-way repeated measures ANOVA across visits 1 and 2. ICC$_{2,1}$ = intraclass correlation coefficient, model 2,1. SEM = standard error of measurement, expressed as absolute values and percentages of the mean.

The Effectiveness of Therapy Approaches for Non-Native English Speakers of Chinese Background

Angel Paramore

Harding University
Scholar Symposium Participant
Subject Area: Biomedical Sciences

My research was titled “The Effectiveness of Therapy Approaches for Non-Native English Speakers of Chinese Background”. The research conducted compared a minimal pair approach to a visual feedback method along with minimal pair approach, to determine which method was more effective in non-native English speakers acquiring English vowel sounds. Two graduate Chinese students of Mandarin dialect were
the subjects in this study. The visual feedback method was utilized through an iPad application called VowelViz. The two subjects received eight hours of speech therapy.

Although the results of this study were not statistically relevant, valuable information was learned throughout this study that can be beneficial for speech-language pathologists who are working with clients who are non-native English speakers. Because of the growing number of international students enrolled in colleges and universities in the United States it is important for speech-language pathologists to be aware of the best methods to help these students become more intelligible. This study is also beneficial to the existing body of research on accent modification services.

Variability of Pseudomonas aeruginosa recovered from cystic fibrosis patients in different age groups

Elizabeth Pascual, James Royall, Erika Lutter
Oklahoma State University
Department of Microbiology
Subject Area: Biological Sciences

Cystic fibrosis (CF) is the most common autosomal recessive genetic disorder, resulting in faulty chloride ion channels in the lungs. As a result, the lungs are severely compromised with viscous secretions leading to chronic and repeated infections, and the colonization of a diverse microbial community. Pseudomonas aeruginosa is one of the primary pathogens in the CF lung and prior research has demonstrated a high degree of phenotypic heterogeneity among adult isolates in comparison to control strains. This study uses subsets of P. aeruginosa CF isolates recovered from two patients in each age category: children (under 13), adolescents (13-18), and adults (over 18). Isolates were assayed for a number of virulence factors including surface motility (swim, swarm, and twitch) and production of hydrogen cyanide, biosurfactant, casein protease, and various fluorescent pigments. Isolates from most patients showed a high degree of consistency in producing hydrogen cyanide, fluorescent pigments, protease and biosurfactant. There was, however, variability seen in the different surface motilities of isolates between the different age groups. These results provide insights to the variability of P. aeruginosa between age groups and confirm differences between P.
Vicarious Trauma Risk & Prevention For Victim Service Providers
Pam Pearsall, Dr. Joseph Grzywacz, Jordan Nicolle Hobbs, Dr. Kami Gallus
Oklahoma State University
Department of Human Development and Family Science
Subject Area: Social Sciences

Many consider it a privilege to serve others, but caring may have costs (Perry, 2014). Secondary trauma is not uncommon among those who serve survivors of domestic violence, sexual assault, and stalking (DVSA); consequently, it is imperative to protect the wellbeing of the DVSA workforce. Protecting the DVSA workforce is especially salient in Oklahoma which ranks 3rd highest in the nation in domestic violence homicides (Fatality Review Board, 2013). CDC research also revealed Oklahoma women report the highest, and Oklahoma men report second highest, rates of domestic violence, sexual assault, and stalking in the nation (2010).

**Aims:** 1) Describe worker wellbeing training for DVSA social service agencies, and areas of concern identified by Program Directors, with particular attention to availability of training for compassion fatigue, secondary trauma, and burnout (IRB HE-14-20). 2) Accumulate data describing programs and initiatives in place and document suggestions for future programs, considering anticipated national budget deficits and regionalization of service programs in other states.

**Methods:** In person interviews conducted with 10 Oklahoma DVSA programs and Oklahoma Coalition Against Domestic Violence, Sexual Assault, and Stalking (OCADVSA) Program Directors.

**Results:** All programs have experienced budget cuts and staff shortages, and have no training budgets. No programs reported monitoring worker wellbeing of either paid employees or volunteers working with DVSA survivors. The majority of programs recommend reinstating burnout retreat, with regional availability.

**Discussion:** The state of Oklahoma needs to develop a coherent strategy for addressing, delivering, and funding procedures that protect and monitor the wellbeing of DVSA workers.

Digestive Efficiency of Free-ranging Turkeys (Meleagris gallapavo) in Cañada de los Osos Ecological Reserve
Danielle Perryman, Scott Shaffer
Oklahoma State University
Integrative Biology
Subject Area: Biological Sciences

Food samples collected from the stomachs and crops of free-ranging turkeys (*Meleagris gallapavo*) shot during the junior hunts were analyzed to evaluate the food consumed and the gross energy density. Energy density of the samples was measured using a bomb calorimeter (Parr 1351, 1998) and compared to standards of known energy content (e.g. benzoic acid). Whole specimens of fresh food items consumed by wild turkeys were also dried and analyzed to determine water and gross energy contents. These samples were representative of the food available to the turkeys in the reserve. Finally, fecal samples from turkeys collected on the reserved were compared to the food available and consumed to evaluate the digestive efficiency of wild turkeys at the reserve. The results suggest the species is approximately 50% efficient as is typical of granivorous species. This information can be used to help manage turkey populations in Cañada de Los Osos Ecological Reserve. Additionally, the provides insight into the digestive systems of foothill avian species and their feeding strategies.
Smart Tool NORM Remediation SOP

Jason Peugh
Oklahoma State University
Environmental Science
Subject Area: Physical Sciences Technology

I have completed a Smart Tool Natural Occurring Radioactive Material (NORM) Standard Operating Procedure (SOP) development from concept to implementation. This includes every detail from equipment lists to dedicated document preparation. I refer to both NORM and TENORM (Technologically Enhanced NORM) as NORM. I have conducted expansive regulatory reviews to insure compliance with this operation as well as a literature review to define NORM in detail, how NORM is accumulated, health issues associated with NORM, and required protection.

The Purpose of APEX’s NORM Program is to introduce a completely new service to Apex’s clients. The document will give a detailed overview of three areas in the NORM Program. Areas two and three (Facility Audits and Disposal & Management) are in progress and will be completed at a later date.

The SOP covers smart tool decontamination operations from start to finish. This is a complex operation requiring many parts and regulated by a multitude of federal, state, and local organizations. Each section of this SOP covers all the information needed to know about the proper operation, regulatory requirements, personnel and equipment needed for this program. All required paper work and documentation is also included.

Pyroelectric Infrared and IMU data fusion for Indoor Human Localization and Tracking

Minh Pham, Dan Yang, Weihua Sheng
Oklahoma State University
School of Electrical and Computer Engineering
Subject Area: Physical Sciences Technology

The purpose of this research is to develop a human localization and tracking method assisting elderly person living alone at home. We built a mock apartment with furniture, in which we can perform experiment like walking, sitting, and lying. Passive Infrared sensors (PIR) and Inertial Measurement Unit (IMU) are two kinds of sensor which are used to collect data. PIR sensors, attached on the ceiling, return binary outputs telling us whether or not the human is inside the detective range, which is a circle with radius of 4.2 ft. One IMU is used for collecting 3D motion data in order to estimate velocity and heading angle, and recognize body activities as well. Recognized body activities are then mapped to the mock apartment map to re-correct the errors of the heading or human locations, which are caused by drift in IMU sensor. We use a data fusion method by employing particle filtering to estimate the human location. The experiments are evaluated with assistance of an OptiTrack system which provides the ground truth of human location. The results have shown a high accuracy in localizing and tracking human in indoor environment.

The implications of the mobility of executive groups: An empirical analysis

Tessa Recendes, Aaron Hill
Oklahoma State University
Management
Subject Area: Social Sciences

Departing from the historical focus on the effects of individual key employee mobility, recent research has begun to examine the effects of group key employee mobility. Recent research has also started to explore the effects of executive mobility, however, research has not yet fully examined the performance or strategic consequences of group mobility at the executive level. Drawing from human capital and upper echelons theory, we extend this research by exploring the firm-level performance and strategic consequences of group executive mobility. In this paper, we specifically focus on analyzing the strategic and performance outcomes
for firms that gain a group of executives from the same firm versus firms that gain multiple executives from different firms. We also analyze the performance consequences for those firms that lose a group of executives to the same competitor compared to firms that lose multiple executives to different competitors.

**To Correct or Not To Correct: Examination of Statistical Correction Practices in Neuroimaging Journals**

Joshua Redmond, Matt Vassar, Gregory Cook, and Branden Carr

Oklahoma State University
Pharmacology/Physiology
Subject Area: Education

Neuroimaging data is often analyzed at the voxel level or cluster level and involves forming a statistical image that can be assessed for statistically significant experimental effects. Given the potential for Type I error within voxel-wise or cluster-wise comparisons, it is necessary to employ post-hoc adjustments and corrections that may be used to control this issue. To date, many of the articles discussing these techniques are rather technical and mathematically-intensive. Furthermore, unanswered questions remaining regarding the actual use of these techniques in practice.

The purpose of this poster presentation is to examine the use of post-hoc adjustments and corrections in neuroimaging research in 2 academic journals and to provide a conceptual understanding of these procedures.

Two peer-reviewed journals (Journal of Neuroimaging and Brain Imaging and Behavior) were content analyzed over a 5 year period to examine the types of post-hoc procedures being utilized by neuroimaging researchers. A comprehensive literature review was performed on the types of post-hoc procedures suitable for such data. All articles that used fMRI, CT, and PET scans were included and all angiography, ultrasounds, and reviews were excluded.

We analyzed 373 peer-reviewed articles from Brain Imaging and Behavior and Journal of Neuroimaging from 2010-2014. Of these 50.5% reported the use of post-hoc test in Journal of Brain Imaging and 22.4% in Journal of Neuroimaging. The most common post-hoc test used for Brain Imaging and Behavior was the Boferroni and Familywise error (FWE) while the False Discovery Rate (FDR) test was most common in the Journal of Neuroimaging. Overall FDR was the most commonly used (28 articles) method for post-hoc analysis. There were quite a substantial amount (30 articles) overall that did not mention which post-hoc analysis they utilized while the majority of articles did not conduct (48%) any post-hoc analysis.

Post-hoc adjustments are an important aspect of data analysis in neuroimaging. In many cases, the explanatory articles detailing these procedures are mathematically complex and not accessible to an audience of practitioners. This poster presentation showcases a sample of the different types of corrections commonly applied in the literature as well as the overall percentages of post-hoc analysis being performed in neuroimaging articles. With the issue of Type I errors skewing true effect sizes, careful assessment is needed to ascertain if articles have addressed the issues of multiple comparison.

**Adverse Childhood Experiences (ACEs) and Related Protective Factors in a College Aged Sample**

Connor C. Reece, Tayler M. Jones, Hannah C. Espeleta, Amanda Morris, Jennifer L. Daer, Leigh E. Ridings, Lana Beasley

Oklahoma State University
Department of Psychology
Subject Area: Social Sciences

Adverse childhood experiences (ACEs) are extremely prevalent in today’s society (Brown et al., 2009; McGavock & Spratt, 2014) and have been associated with diminished physical and mental health later in life, including increased psychosomatic disorders (Masuda, 2007), sleep difficulties (Chapman, et al., 2011), and psychopathology (Speranza, et al., 2003). However, protective factors have been shown to have an
ameliorating effect on outcomes of ACEs (Folger et al., 2013). The present study examines undergraduate students at a large Midwestern university based on self-identification of trauma exposure via an online screener. Participants will complete online versions of the Adverse Child Experiences Questionnaire (ACE-SF; Felitti et al., 1998) and the Protective Adverse Childhood Experiences Scale (PACES) and receive credit in exchange for their participation. The study will examine the prevalence of cumulative ACEs within the current sample and the relation between the cumulative ACEs and protective factors. Data will be analyzed via an Analysis of Variance (ANOVA) statistical approach to determine if there are differences between the amounts of protective factors present in individuals with varying amounts of ACEs. Findings will assist in interventions aimed at increasing protective factors for individuals with ACEs. Limitations and future directions of the study will be discussed.

Changes in undergraduate students’ multicultural awareness due to enrollment in a university-approved diversity course

Lawrence Richardson, Jennifer Volberding, Melissa Zahl
Oklahoma State University
School of Applied Health and Educational Psychology
Subject Area: Education

The purpose of this study is to determine the effectiveness of diversity coursework and to foster and cultivate active thinking about diversity issues. Undergraduate students enrolled in a single university approved diversity course at a state-sponsored Southern university were solicited to participate in this study. Students came from majors across the university and were enrolled in one of the seven sections offered in the fall of 2013. All seven sections of the course were taught identically with standardized lectures, readings, assignments, tests, and quizzes created by a core group of faculty members and approved by a university committee. The Munroe Multicultural Attitude Scale Questionnaire (MASQUE) was selected out of multiple measures as it can be generally applied to a variety of academic majors and professions. The MASQUE is an 18-item questionnaire that is broken into three subsets: knowledge, caring, and action. The results demonstrated a statistically significant difference between the pre and post scores ($F_{1,89} = 6.73$, $p=0.01$), while only the caring ($F_{1,89} = 5.06$, $p=0.03$) subset demonstrated statistically significant differences (knowledge $p=0.12$, action $p=0.74$). These findings suggest that diversity coursework facilitates cognitive and behavioral aspects of multicultural attitudes.

An Organotrophic Medium as a Substitute for Stolen Chloroplasts

Kaitlyn Riddle, Stephen D. Fields
East Central University
Scholar Symposium Participant
Subject Area: Biological Sciences

Gymnodinium acidotum is a freshwater dinoflagellate that employs a nutritional strategy known as kleptoplasty. The dinoflagellate ingests Chroomonas coerulaea, a unicellular cryptophycean alga that has a single chloroplast. Organelles of the prey cell are sequestered within G. acidotum for weeks, and the dinoflagellate depends on photosynthates from the stolen chloroplasts for sustained growth. The purpose of this study is to produce cryptomonad-free G. acidotum cultures, because the presence of the cryptophycean organelles has complicated characterization of the G. acidotum genomic sequence and gene expression. In order to obtain axenic, aplastidic cultures of G. acidotum, supplementary organic compounds must replace products ordinarily furnished by the kleptoplasts and bacterial flora. Bacteria-free cultures are first produced through treatment with a cocktail of cell-wall inhibiting antibiotics that includes meropenem, cephradine and carbenicillin. Dinoflagellates are then suspended in F6 medium (an inorganic algal medium) enriched with glucose, glycerophosphate, histidine and glycine. Dinoflagellate populations continue to divide and grow in this media for several weeks, but eventually die, even after subculturing to fresh, enriched media. This indicates a deficiency of complex, organic substrates. We are currently testing dilute versions of Saccharomyces cerevisiae complete media, which supplies the range of amino acids, an ammonia-based nitrogen source and glucose.
Childhood Protective Factors and Adult Optimism as a Possible Mediator in the Relation between Adverse Childhood Experiences and Anxiety Symptoms

Georgeanna A. Roberts, Jennifer L. Daer, Hannah C. Espeleta, Leigh E. Ridings, Lana O. Beasley

Oklahoma State University
Department of Psychology
Subject Area: Social Sciences

Traumatic experiences have been linked to a variety of negative outcomes later in life (Famularo et al., 1992). More specifically, research has indicated that childhood trauma is predictive of anxiety and depressive disorders (Heim & Nemeroff, 2001). Despite this knowledge, an important research question remains; what is the role of childhood protective factors and optimism on anxiety for individuals who have experienced a trauma? It is hypothesized that general childhood protective factors and adult optimism will mediate the relation between adverse childhood experiences and anxiety symptoms, such that young adults with increased childhood protective factors and higher levels of adult optimism will have decreased symptoms of anxiety. To test this hypothesis, data will be collected from 100 undergraduate students at a large Midwestern university. Individuals who have experienced a traumatic event will complete a series of online self-report measures. A hierarchical regression (controlling for confound variables) will be used to test the mediating effects of childhood protective factors and adult optimism on the relation between young adults’ adverse childhood experiences and anxiety. Findings will allow researchers to inform treatment approaches for individuals exposed to childhood trauma.

Chlamydia trachomatis manipulates Protein Kinase C during infection

Brooke Romine, Amanda Behar, Erika Lutter

Oklahoma State University
Department of Microbiology
Subject Area: Biological Sciences

Chlamydia trachomatis is the most commonly reported bacterial infection in the United States and the leading cause of sexually transmitted infections worldwide. Infection by C. trachomatis can lead to severe medical complications in women, including pelvic inflammatory disease; yet, despite these concerns, there are fundamental gaps in our understanding of Chlamydia pathogenesis, particularly with regards to the mechanisms used to manipulate host proteins for intracellular survival and growth. Our central hypothesis is that C. trachomatis manipulates and recruits host signaling proteins, such as Protein Kinase C (PKC). We have shown that C. trachomatis manipulates PKC during infection, recruiting multiple isoforms of PKC to the chlamydial parasitophorous vacuole, the inclusion, during infection. Phosphorylated PKC co-localizes with activated Src family kinases at discrete microdomains on the inclusion membrane. PKC substrates were also found to localize to the entire periphery of the C. trachomatis inclusion. The recruitment of PKC and PKC phosphorylated substrates suggests that PKC may play a very important role during C. trachomatis infection. These studies provide novel insights into the diverse mechanism by which C. trachomatis manipulates host cell processes for survival and infection.

Effects of Varying Organic Loadings on Bio-Sand Filter Performance

Adrian Saenz, Tyler Autry, Vishnu Paidimarri, Eli Shepherd, Kevin Vo, and Kevin Wang

Oklahoma State University
School of Civil and Environmental Engineering
Subject Area: Physical Sciences Technology

With the introduction of bio-sand filters to developing communities, large populations of people have gained the ability to steadily supply clean water for their families. Bio-sand filters work by using physical straining and biological absorption to capture harmful bacteria from dirty water sources, allowing potable water to pass through the filter media. The challenges of bio-sand filters are that the original filter design cannot
handle high concentration of organic material, thus the filter applications are limited. The purpose of this research is to calculate the theoretical maximum and minimum concentration of organic material that a typical bio-sand filter can process. During this experiment, six bench scale cylindrical bio-sand filters were created and loaded with three different organic concentrations. The results of the experiment showed that in every group, bio-sand filters steadily reduce the coliform counts over a time period of two to three weeks, until eventually converging to an absolute minima coliform count. These results clearly show that there is a lower limit to the amount of coliform that a filter can prevent from entering the human body and that at high Total Organic Carbon (TOC) loadings, removal of coliform bacteria is significantly more when compared to lower TOC loadings.

Sex Ratio According to Incubation Temperature in the Collared Lizard, Crotaphytus collaris

Enrique Santoyo Brito, Matthew Anderson, Stanley F. Fox

Oklahoma State University
Integrative Biology
Subject Area: Biological Sciences

Two modes of sex determination occur in squamates: genotypic sex determination (GSD) and environmental sex determination (ESD). An example of ESD is temperature-dependent sex determination (TSD). TSD is known in reptiles and has evolved multiple times. Collared lizards, Crotaphytus collaris, are oviparous and distributed in the southwestern United States and northern Mexico. It is uncertain if this species has GSD or TSD. Although no sex chromosomes have been identified, the species is regarded as having GSD. In a previous study in which sex was determined after incubation of eggs at different temperatures in the laboratory, the authors considered their results inconclusive. Thus, the exact sex determination mechanism in C. collaris is unknown. The objective of this study was to measure the effect of incubation temperature on sex ratio of C. collaris hatchlings. We incubated eggs at seven constant temperatures: 21°, 27°, 28°, 30°, 32°, 33.5 and 35°C. We determined the sex of 79 resultant hatchlings from 19 females from a wild population. We included the results, reported in Viets et al. (1994), of 18 hatchlings for the same species incubated at 27°, 28°, 30°, and 32°C. Results suggested a clear difference in sex ratio dependent on incubation temperature, i.e., TSD.

The Effects of Parental Attachment and Parental Marital Status on Self-Concept

Kristin Scanlon

Harding University
Scholar Symposium Participant
Subject Area: Social Sciences

Because of the decline of the family system in Western culture, studies in the area of family systems are a growing research field. The main objective of this research is to discover the effects of parental attachment, specifically on individuals reared in divorced homes versus those reared in non-divorced homes on self-concept. The researcher hypothesized that those raised in a divorced home will have lower levels of parental attachment and a lower self-concept, and those raised in a non-divorced home will have higher levels of parental attachment and a higher self-concept. The researcher did a quantitative study using surveys, which included The Mother and Father Attachment Inventory (Armsden & Greenberg, 1989) and the Rosenberg Self-Esteem Scale (Rosenburg, 1965) to assess parental attachment and self-concept. Each participant also indicated parental marital status. The data was analyzed using a 2-way ANOVA. Because there was no statistical significance between the variables, the results were not conclusive.
Comparison of Self-Identified Sexual Minority and Heterosexual Individuals on Items Assessing Dating Anxiety in Measures of Social Anxiety

Brent Schneider, Cynthia Turk
Oklahoma State University
Counseling Psychology
Subject Area: Social Sciences

Measures of social anxiety contain items assessing dating fears that use “opposite sex” language. Weiss, Hope, and Capozzoli (2013) found that inclusive wordings of these items produced equivalent or superior psychometric properties to the original versions. The sample, however, consisted of undergraduates, most identifying as heterosexual. The current study addresses this limitation using a sexual minority sample. Participants (96 heterosexual, 72 bisexual, 32 gay/lesbian) completed the original versions of the Social Interaction and Anxiety Scale (SIAS), the Interaction Anxiousness Scale (IAS), the Social Phobia and Anxiety Inventory (SPAI) and the Social Avoidance and Distress Scale (SADS). Revised items suggested by Weiss et al. (2013) were included within each measure. For original items, differences emerged between the groups on all measures. For the revised items, fewer group differences emerged. For scale totals using the original wordings, group differences emerged on all measures, except the SADS. For scale totals using revised wording, fewer group differences emerged. These results provide additional evidence for using inclusive language within measures of social anxiety. Future research should examine social anxiety among bisexual individuals, as this group consistently reported the highest levels of social anxiety.

Balancing Behavior and Immune Responses to Avoid Infection

Katharina Schreier
Oklahoma State University
Integrative Biology
Subject Area: Biological Sciences

Exposure to disease is a universal threat to all living organisms and self-defense occurs in a variety of ways. Individuals can proactively prevent disease through avoidance behaviors. However, if they do become infected, individuals activate the immune response to control the infection. It is hypothesized that a trade-off occurs between avoidance behaviors and activation of the immune response to provide optimal protection against infection. A trade-off may occur because of the costs associated with both behavioral and physiological defenses. Avoiding areas of disease is costly for social animals that depend on large groups to find food, mates, or protection. Likewise, strong immune responses require energetic investment and may lead to auto-immune diseases. Support for a trade-off in defenses against infection comes from a previous study on house finches. Using a captive population of male and female zebra finches, I will confirm this trade-off between behavioral and immunological strategies against infection. I am extending the previous work on house finches by examining individuals’ repeatability in strategy utilization over time and if the stress hormone corticosterone mediates the trade-off. Ultimately, my research illustrates how behavioral defenses supplement other defenses against disease and contribute to the persistence of individual variation in disease susceptibility.

Antropometric and Physiological Profile Differences in Reserve Officers’ Training Corps Cadets

John Sellers, Taylor P. Monaghan, Bert H. Jacobson, Jessica A. Schnaiter, Garrett M. Hester, Frank M. Benik
Oklahoma State University
Health & Human Performance
Subject Area: Education

PURPOSE: To determine the physiological profile differences, if any, between Army Reserve Officers’ Training Corps (ROTC) Cadets and Air Force ROTC Cadets. METHODS: Subjects consisted of Army (N = 11) ROTC Cadets, who perform PT five d/wk, and Air Force (N = 12) ROTC Cadets, who perform PT...
two d/wk. After signing an approved IRB consent form, Cadets completed two days of testing. The first day consisted of anthropometric measurements and a 30-sec Wingate Anaerobic Test (WAnT). After a 2 to 7d rest period, the Cadets returned and completed a maximal oxygen uptake treadmill test (VO$_2$ max) using the Bruce Protocol. **RESULTS:** There were no significant (p>.05) differences between the two groups for the anthropometric measurements. As a group, the Army Cadets displayed higher VO$_2$ max (58.04 ml/kg/min$^{-1}$ vs 53.96 ml/kg/min$^{-1}$) and Peak Power measurements (943.73 W vs 927.67 W), than their Air Force ROTC counterparts, but none of the differences were significant (p>.05). **CONCLUSION:** Army Cadets failed to perform significantly better than Air Force Cadets in either aerobic or anaerobic fitness testing, which may be an indication that further research is necessary in terms of PT sessions being formatted based on the specific operational job requirements of military personnel.

THE EFFECT OF MANGO SUPPLEMENTATION ON CLINICAL PARAMETERS OF PRE-DIABETIC INDIVIDUALS

Jessica Semkoff$^1$, Shirley Evans$^1$, Sawanya J. Janthachotikun$^1$, Heba Eldoumi$^1$, Maryam Mahmood$^1$, Maureen Meister$^1$, M. Payton$^2$, Sandra Peterson$^1$ Penelope Perkins-Veazie$^3$, Stephen L. Clarke$^1$, Brenda J. Smith$^1$, and Edralin A. Lucas$^1$

Oklahoma State University
Department of Animal Science
Subject Area: Biomedical Sciences

Affecting over 26 million Americans, diabetes (DM) is the seventh leading cause of death in the United States (US) due to the many associated complications and co-morbidities from increased blood glucose levels. The most common form, type 2 DM, or adult-onset diabetes, has increased in prevalence due to the rise in obesity rates. Pre-diabetes (fasting blood glucose between 100-125 mg/dl) is a condition of elevated blood glucose level but not high enough to have the diagnosis of diabetes. Dietary intervention in individuals with pre-diabetes may help delay or prevent the development of diabetes. The consumption of fruits and vegetables has been investigated for their effects on chronic diseases, such as diabetes and obesity. This study investigated the effects of freeze-dried mango supplementation on clinical parameters of pre-diabetic individuals. The mango fruit is rich in vitamins, minerals, and fiber, as well as, the phenolic compounds, quercetin and mangiferin, which possess both anti-inflammatory and antioxidant properties. In a cross-over study design, twenty eight pre-diabetic individuals participated in the study and consumed either a freeze-dried mango (10 g) or a placebo supplement once daily for 12 weeks with a 3-4 week wash-out period between the two treatments. After 12 weeks of supplementation, there were no significant differences in glycemic indices between mango and placebo, however, a trend of decreased blood glucose and increased insulin levels were observed.

1Nutritional Sciences Department, Oklahoma State University, Stillwater, OK, 74074; 2Department of Statistics, Oklahoma State University, Stillwater, Oklahoma; 3North Carolina State University Research Campus, Kannapolis, North Carolina
**Analysis of Fly Count Repeatability Between Distinct Observers**

Will Shaffer, C. Fulton, E. Ricketts, K. Branham, K. Hamlin, B. Girod, J. Talley, and M. Rolf

Oklahoma State University  
Department of Animal Science  
Subject Area: Biological Sciences

Horn flies cost producers an estimated $1.4 billion annually. Various chemical methods exist to control horn fly populations, but fly populations have shown resistance to these pesticides when not used properly. One possible solution is to develop selection tools for producers so that they can improve resistance or resilience to horn flies and reduce their reliance on chemical control methods. This approach will require long-term collection of fly count data on cattle, which will ultimately be used to determine the genetic resistance to flies in beef cattle. This project is a preliminary assessment to determine the viability of using multiple people to perform fly counts.

To evaluate the repeatability of observations across multiple observers, three students were provided identical images of cattle and were independently asked to count the number of flies on each animal. Pictures included animals that had both low (Week 1) or high (Week 5) counts for each animal. None of the testers had access to other results until after the completion of their counts to prevent bias. Pearson Correlation Coefficients and Spearman Correlation Coefficients between individual observers’ counts were analyzed. Correlations were generally high, indicating that utilization of multiple observers is a viable collection method.

**The Effects of Electric Shock on Western Rattlesnake Venom**

Kirstin Shields, Dr. Terry Cluck

East Central University  
Scholar Symposium Participant  
Subject Area: Biological Sciences

The purpose of this study is to observe the effect of electric shock on Western Rattlesnake venom when it is applied to the nematode Caenorhabditis elegans. Western Rattlesnake venom concentrate was diluted to .05mg/10microliters which meets the LD50. Various trials were conducted and it was found that the venom when administered topically and ingested has no measurable effect on the health of C. elegans. Additional trials with DMSO as a carrier for the venom were conducted in a one percent concentration relative to the venom. The C. elegans on each plate survived and reproduced but displayed less movement.

**Isolation of Ethanol Reduced Susceptibility Staphylococcus Aureus**

Ashley Simenson, Nathanial J. Torres, John E. Gustafson

Oklahoma State University  
Department of Biochemistry and Molecular Biology  
Subject Area: Biological Sciences

We report attempts to isolate ethanol (Eth)-reduced susceptibility (EthRS) Staphylococcus aureus mutants utilizing two methods: 1. Selection of colonies from ethanol gradient (0 ê20% v/v) plates; and 2. Selection for surviving colonies from 48 hr cultures challenged with ethanol (12% v/v). A total of 3 putative EthRS mutants isolated with method 1 and 6 isolated with method 2 were compared to the parent strain. No putative EthRS mutants showed increased Eth minimum inhibitory- or minimum bactericidal-concentrations, or distances grown on an ethanol gradient. Three putative EthRS mutants did however grow farther on a tea tree oil (0 ê7% v/v) gradient and of these; two grew slower and one also grew farther on a triclosan gradient (0 ê0.5 μg/mL) compared to the parent strain. In addition, compared to the golden colored parent colonies, two putative mutants produced white colonies. While the putative EthRS mutants isolated did not demonstrate reduced ethanol susceptibility, some did demonstrate altered susceptibility to other membrane active substances and slower growth. This suggests that while ethanol cannot select for (EthRS)
mutants, ethanol challenge can select for mutants demonstrating altered susceptibility to other membrane
active substances. The exact nature of any mutations in these mutants remains to be elucidated.

The Impact of Repair Attempt Behavior on Negative Rigidity in Women During Marital Conflict

Jennifer Smith, Brandt Gardner

Oklahoma State University
Department of Human Development and Family Science
Subject Area: Social Sciences

This poster will present findings from an empirical study of the influence of self-reported repair attempt
behaviors of husbands and wives in relation to affective flexibility and negativity during marital interaction.
Real-time, self-reported affect data were collected using a continuous-response measure, and affect variables
created via State Space Grids. As anticipated, wives’ self-reported repair attempt behavior was more
predictive of both affective flexibility and negativity during positive conversations. Contrastingly, husbands’
self-reported repair attempt behavior only significantly predicted these variables when in junction with the
wives’ reporting his engagement in repair attempt behavior during difficult conversations. Thus, both
partners agreed that the more the husbands engaged in repair attempt behavior, the less visits they made to
negativity during difficult conversations. The implication of this finding is that, while women do have a
large influence on relationship quality, men have a significant impact on how positive the outcomes are in
their relationships as well. An unexpected finding of this study was that, the more wives reported their own
repair attempt behavior, the less emotionally flexible the couples were during difficult conversations. There
is evidence that repair attempts are strongly associated with stability and consistency; therefore, perhaps this
finding is simply showing this stabilizing effect in the negative context. However, presenters will propose
that this counter-intuitive finding suggests the presence of potentially destructive rigidity in women when
their efforts to improve marital interaction are unreciprocated. Presenters will discuss the importance for
both spouses to give, recognize, and accept repair attempts during negative marital interaction. Participants
will learn about the potential risk of increased negative rigidity due to unreciprocated repair attempt
behavior, and the likelihood that women are at an increased risk for such rigidity. Presenters will discuss
future research implications and practical applications for the couples therapy setting.

Is Cursing a Form of Social Risk-Taking?

Joshua Smith, Hailey Neff, Shelia M. Kennison

Oklahoma State University
Department of Psychology
Subject Area: Social Sciences

The research investigated the factors related to the use of profanity by college students. Prior research has
addressed the frequency of usage of taboo words, their history, and their usefulness in society (Jay, 2009).
We reasoned that using profanity is a form of social risk-taking, because when one curses, one takes the risk
of offending one or more others in the interaction. In the present research, we hypothesized that those who
generally take more risks in daily life would use profanity more often and possibly use a wider variety of
profane words than those who take fewer risks in daily life. In a survey with 364 undergraduates, we
assessed use of profanity by asking participants to indicate how often they use specific profane words and by
asking participants to rate multiple questions about their typical use of profanity. We asked general risk-
taking using the CDC (2008) State and Local Youth Risk Behavior Survey (YRBS, Kolbe, Kann, & Collins,
1993). We also assessed sensation-seeking, a variable shown to be related to propensity for risk-taking
(Zuckerman, 2007). The results of our study supported our hypothesis, as the use of profanity was
significantly related to other types of risk-taking and to sensation-seeking.
Large Rectangular Bale Moisture Variability: Preliminary Evaluation

Ni Nyoman Sulastri, C.C. Craigie, M.D. Buser, E.A. Miller, V. Schielack, R.L. Huhnke

Oklahoma State University
Biosystems and Agricultural Engineering
Subject Area: Biological Sciences

The objective of this study was to determine the characteristic of moisture variability within bales after eight months in stacks either vented or unvented wrapped stacks. Throughout 2011, 90 large format .9x1.2x1.9 m³ switchgrass bales were sampled after in storage for 8 months in an evenly space grid throughout the bale (54 core samples per bale). Forty five bales were unvented wrapped and the rest were vented wrapped. Additionally, bales were stored in tightly stacking bales. Results showed that bale location within the stack made a significant difference on moisture content within the bale. For top bales, higher moisture content regions were located at the top part of the bale. Conversely, the bottom bales had higher moisture content regions at the bottom part of the bales. Based on regression analysis, there is a strong positive relationship between average moisture content with its standard deviation. In-bale moisture content explains approximately 85% of total variation of its standard deviation with regression line equation \( y \approx 0.76x - 0.06 \).

Enhancement of Catalytic Features of Heme Proteins Attached to Magnetic Nanoparticles

Loren Sunday, Gayan Premaratne, Ryan Matlock, Rajasekhar Nerimetla, Sadagopna Krishnan

Oklahoma State University
Department of Chemistry
Subject Area: Physical Sciences Technology

Efficiency of covalently conjugated heme proteins to magnetic nanoparticles (MNP) and the effect of MNP scaling up were examined in this study. Conjugates were prepared by using carbodiimide chemistry to covalently link myoglobin to the polyacrylic functionalized 100 nm magnetic nanoparticles. The MNP scaled up in the order of 1, 5 and 10 times to evaluate the reusability and stability of the conjugates prepared. The peroxidase like activity of myoglobin was utilized in evaluating the products after using 1 mM H2O2 as the substrate and 5 mM 2,2-azino-bis(3-ethylbenzothiazoline-6-sulfonate) (ABTS) as the color developing dye. The reusability tests were performed from every 30 minutes after the conjugate was prepared with the ABTS reaction and stability was checked for 7 and 14 days storing the conjugates on phosphate buffer solution (pH 7.4). All the products were quantified using UV/Visible spectrophotometry. Five and ten fold scaling up the MNP resulted two fold and four fold increment in products. Conjugation proved extensive stability for even 4 months with comparison to myoglobin by itself, loosing its activity with prolonged period of storage.

Isokinetic particulate matter air sampler electronics

Drew Sutterfield, Michael Buser, Philip Moore, Hong Li, Cathleen Hapeman

Oklahoma State University
Biosystems and Agricultural Engineering
Subject Area: Biological Sciences

Determining particulate matter (PM) emission rates from poultry houses is critical for determining any regulatory actions required by the USEPA. Current isokinetic sampling systems determine PM emission rates by measuring the PM concentration inside the building and multiplying by a building ventilation rate. This study focuses on the development of the electronics for an isokinetic sampling system to measure the PM emission rate from a commercial poultry house ventilation fan. This system builds off of a previous USDA-ARS low volume ambient air sampler that allowed a user to input a target airflow rate and then the sampler used a solenoid valve and microcontroller to maintain the target airflow as the system pressure drop increased due to particulate build up on the filter. The new system incorporated an additional pressure transducer to measure the free stream velocity at the sampler nozzle. The sample stream airflow rate was
then regulated by the solenoid valve and microcontroller so that it matched the free stream velocity. This new system has the ability to measure PM emission rates exiting the house from the outside of the house and does not require the ventilation rate to be measured separately from the PM mass.

Ensuring Shear Strength in I-shaped Prestressed Concrete Bridges

Nuttapong Tanasap, Bruce W. Russell, Ph.D., P.E.
Oklahoma State University
School of Civil and Environmental Engineering
Subject Area: Physical Sciences Technology

Prestressed I-shaped girders are commonly used for new highway bridge structures. Due to the thin web of I-shapes and maximum shear stress near mid-height, web shear cracks will form and, under load, propagate to the end regions of the beam where the anchorage zones of pretensioned strands are affected. The purpose of this research is to examine and analyze prior test results to help ensure the shear strength of prestressed I-shape concrete beams, and to help prevent shear failures that emanate from web shear cracking in I-shaped beams. Four prestressed I-Shaped girders were tested at each end. Altogether, eight shear tests were performed. Variables included differing amounts of both vertical and horizontal shear reinforcement contained within the webs of the beams. All data are analyzed using the same methods, including plane stress analysis using Mohr’s circle, shear stress vs. shear strain analysis, and Truss Model techniques, or strut and tie models. Test data are graphed and investigated. The test data demonstrates that the additional horizontal shear reinforcement dramatically increases the shear capacity of the beams, and helps mitigate failures caused by shear/bond interactions.

Neural Indicators of Autonomic Arousal for Threat and Neutral Stimuli Among Worriers

Danielle Taylor, Matt Judah, Kristen Frosio, Adam Mills, Evan White, Kelsey Shelton, & DeMond Grant
Oklahoma State University
Department of Psychology
Subject Area: Social Sciences

The core symptom of Generalized Anxiety Disorder (GAD), worry, is marked by exaggerated and maladaptive attention and response to threat. The Late Positive Potential (LPP) is a neural indicator of attention allocation to emotional stimuli. Heart rate also is associated with cognitive processing of emotional stimuli (Lane et al., 2009). We hypothesize that cognitive processing, indexed by the LPP, should predict preparation for response to threat, measured by RSA. For threat stimuli, there will be greater LPP magnitude, suggesting attention allocation and emotional processing, and this should predict an increase in RSA, as heart rate decreases. EEG and ECG data were collected while 42 undergraduate participants with high or low worry completed an S1-S2 task, in which colored dot cues (either yellow or blue) were presented followed by a picture (either neutral or negative). A multiple regression analysis suggested the LPP explained significant variance ($R^2=.185$, $F(2,39)=4.423$, $p<.05$), such that LPP magnitude predicted RSA for negative stimuli. Correlations suggested there was an association between RSA and the LPP for threat and non-threat among high worriers. These results indicate that neural responses to threat predict autonomic arousal, specifically for threat, and this response is exaggerated among high worriers.
Čšťim: INDIGENOUS METHODOLOGIES, CULTURE AND LANGUAGE REVITALIZATION PROGRAMS IN SALISH COMMUNITIES

Tillie Torpey, Paula Groves Price

Washington State University
Scholar Symposium Participant
Subject Area: Social Sciences

A wide concern in many, if not all indigenous communities is the preservation of their heritage, specifically their language and epistemologies. Within the North American indigenous communities, the colonial establishment of boarding schools and relocation programs established by the U.S. Federal Government to assimilate indigenous youth from their ways of being, has resulted in the extinction of over 50% of North American indigenous languages. This project identifies the most effective practices used in language revitalization programs within Interior Salish speaking communities in the Northwest. This project used the indigenous and qualitative methodologies to understand the close relationship between language and culture for Salish speaking communities. The data collected include interviews, observations, and talking circles in language programs on the Flathead and Spokane reservations.

Associations between Adverse Childhood Experiences, Parenting, and Child Executive Function

Amy Treat

Oklahoma State University
Department of Human Development and Family Science
Subject Area: Social Sciences

Parent adverse childhood experiences (ACEs), harsh parenting, and attachment were examined in relation to the executive function abilities in very young, low income children. Participants in this study were children enrolled at one of the 3 Tulsa Educare sites and their primary caregiver, primarily mothers. Data was collected from 64 parent and child dyads and children ranged in age from 17 months to 40 months. Parent measures included the ACE questionnaire, the DECA attachment scale, and harsh parenting items from the AAPI-2. Child measures included a battery of previously validated executive function tasks and were designed to measure, working memory, cognitive, flexibility and inhibitory control.

Parent’s early adverse experiences were found to predict poorer working memory skills and harsh parenting attitudes were found to predict lower inhibitory control. Harsh parenting attitudes were also found to be moderately associated with cognitive flexibility. Parent self-reported attachment was not found to be related to children’s executive function. The children in this sample performed worse overall on executive function tasks than did children from similar studies drawn from higher socioeconomic backgrounds. Taken together, these findings suggest that adverse childhood experiences, parenting, and socioeconomic status are important in the development of child executive function.

Riding the Bus: A Study of the Accessibility of the OSU – Stillwater Community Transit

William Van Ness

Oklahoma State University
Department of Geography
Subject Area: Social Sciences

An efficient and reliable public transportation or mass transit system is helpful to any populated area because it allows the general public of an area to move across the space and perform their activities. However, many people do not regularly use public transportation because of a perception of lack of accessibility and efficiency of the system and a preference to use private transportation. This research will carry out a study on the effectiveness of the public transportation network known as the OSU-Stillwater Community Transit or The Bus in Stillwater, Oklahoma. The research will survey the current routes and
stops of The Bus system and use GIS and statistical methods to evaluate the accessibility and efficiency of the system. Based on the evaluation results, problems in the current transit system will be identified and suggestions of new or adjusted routes and stops will be made to improve the effectiveness of the transit system. The outcomes from this research are expected to help the operators of The Bus system to improve the current system and better serve the entire population of the city.

The Effects of AquaSmart Coated Sand Products on Growth and Water Use of Greenhouse-Grown Ornamentals and Nutrient Leaching

Magdalena Vinson, Janet Cole
Oklahoma State University
Department of Horticulture and Landscape Architecture
Subject Area: Biological Sciences

Water usage is one of the primary continuing costs for new and established greenhouse operations. One way in which growers have been working to reduce water costs is by using wetting agents and hydrophilic polymers. These products help increase the water-holding capacity of the media, and can allow for less frequent irrigation while maintaining desired growth rates. AquaSmart Enterprises, LLC markets a super-absorbent, coated sand product to the greenhouse ornamentals industry with the statement that the product can increase water-holding capacity and reduce water use in container substrate. The objectives of this study were to evaluate the effects of AquaSmart polymer coated sand products on growth and water use of greenhouse-grown ornamentals, and nutrient leaching. The study was conducted at the Oklahoma State University Research Greenhouse Facility in Stillwater, OK in 2014. Six common ornamental species were tested using three concentrations of AquaSmart and a nontreated control to compare plant water use and growth rates within species. The nutrient study used the same polymer concentrations, and generated nutrient release curves for each concentration. Results will be discussed.

The Impact of EMAP II on Fas Ligand and CD11c Expression by Dendritic Cells

Amber Washington, Dr. D. Kim Burnham
Oklahoma State University
Department of Microbiology
Subject Area: Biomedical Sciences

Dendritic cells (DC) are antigen-presenting cells that play a central role in adaptive immune responses. These cells encounter microorganisms that control the way that T cell responses are generated. Endothelial monocyte-activating polypeptide II (EMAP II) is a cytokine released by cells undergoing apoptosis and has been shown to modulate endothelial cells as well as immune cells. Fas ligand is a protein that, when bound to its own receptor, induces apoptosis. CD11c is a protein that plays an important role in chemotaxis and monocyte adhesion. Our hypothesis for this study is that EMAP II will alter the capacity of DC to express Fas ligand and CD11c. We examined this by using fluorescence to target the Fas ligand and CD11c on the surface of dendritic cells and examining the results using a flow cytometer. The results demonstrate that the dendritic cells show an increase of Fas ligand is expressed on the surface, however an exponential amount of CD11c is expressed. Based on the experiments conducted in the recent past, EMAP II increases the expression of CD11c and Fas ligand on the surface of dendritic cells. This suggests that EMAP II might aid dendritic cells to stimulate immune responses against infectious agents and cancer.
Explore 3-Dimensional effect in 2-dimensional apparel

Bingyue Wei
Oklahoma State University
Department of Design Housing & Merchandising
Subject Area: Humanities

In this study, I was inspired by Pop Art to explore the Pop Art vision from different levels to determine 3Dimensional effects in apparel: both with 3D printing and 2D digital printing to realize a new Pop Art form. This idea led to three questions: How can a digital textile print be engineered to create a 3Dimensional effect on layers of silk chiffon? How can 3D printing technologies be used to complement a 2D textile design? And how can 3D printing technology coordinate with 2D textile design for apparel? To answer these questions, I sketched various fashion design pictures that were inspired from Pop Art. One design was chosen for realization. Using Photoshop and Illustrator I created the 2D textile design in a way to build a 3D effect where the image appeared in three superimposed fabric layers. One element of the design was chosen to transform into a 3D object that would become part of the garment. I used 3D software to transform the 3D effect picture to a 3D object. Next, I used a CubeX printer that heated plastic filaments to build the 3D model. To achieve my idea, I adjusted different sizes of the 3D models, to coordinate with the 2D textile design for the garment. The significance of this work lies in helping people understand how to combine 2D digital printing with 3D printing, to develop fashion apparel, where art and aesthetics are emphasized.

Design of Roll to Roll Manufacturing Machine for Flexible Electronics

Joshua Whitman
Oklahoma State University
Department of Mechanical and Aerospace Engineering
Subject Area: Physical Sciences Technology

Roll to Roll (R2R) manufacturing consists of processing flexible materials (referred to as webs) by transporting on rollers from an unwind roll, through processing machinery, to a rewind roll. This type of processing has numerous advantages over batch processing: it saves time and cost, reduces delay time, and increases efficiency. Because of this, the electronics industry has great interest in developing R2R manufacturing for printed flexible electronics. This research project aims to contribute to this by designing, building, and experimenting with a lamination device compatible with Oklahoma State University's modular R2R platform. Printed electronics are often constructed from several layers (or webs) of different material which are thermally laminated together. The modular R2R platform allows great flexibility in designing different experiments and expanding the capabilities of the machine. The new lamination capability will be achieved by a small roller applying pressure to a large roller internally heated by circulating water. The pressure is applied on the small roller's axis by a lever and a pneumatic cylinder controlled electronically using feedback from a pair of load sensors.

Ecological niche model reveals nine-banded armadillo's (Dasypus novemcinctus) potential northeast range extension

Feng Xiao, Monica Papes
Oklahoma State University
Department of Zoology
Subject Area: Biological Sciences

The nine banded armadillo, Dasypus novemcinctus, is the only species in the family Dasypodidae found in North America, and has greatly expanded distribution in the U.S. since first recorded in southern Texas in 1854. Currently, D. novemcinctus maintains a stable range across 16 states in the U.S. Previous studies on the geographic expansion of this species revealed a possible western moisture limit and a northern temperature limit based on physiological experiments and distribution surveys. We applied ecological niche modeling approach to investigate the relationship between occurrence sites and broad scale climatic conditions, and produced a potential distribution map of D. novemcinctus. The prediction revealed similar
west and north limits, but the north limit extended farther north. Comparison between potential and current distribution of D. novemcinctus suggested possible northeast range expansion to climatic suitable areas in the future.

Creating WOM: Do Restaurant Customers Prefer Different WOM Types for Compliment and Complain?

Seza Zerman, Dr. Yeasun Chung

Oklahoma State University
School of Hotel and Restaurant Administration
Subject Area: Social Sciences

Advanced technology has influenced means of communication and triggered a shift from traditional (in person) communication to social media communication for seeking and sharing information. Therefore, attention has also shifted from personal communication to social media and electronic versions of communication. However, different medium preferences for sharing different outcomes of service experiences (i.e., compliment and complain) remain unaddressed.

The purpose of this study is to reveal if there is a relationship between the experiences that restaurant customers want to share and the type of WOM (i.e., traditional WOM and electronic WOM) they prefer to use to share these experiences. To test the hypothesis of the study, a scenario-based experiment will be used and the result will be analyzed by regression analysis.

The result will be significant for the literature as it will be an empirical study that will add further knowledge in terms of the relationship between experience type and sharing preference of the experience. In regard to practical implementation, the study will be significant for service providers to manage negative and positive feedback from restaurant customers and the impacts of this feedback on potential or current customers.

Characterization and Strain Selection of Seven Oklahoma Native Algae Species for Biofuel Production

Nan Zhou, Dr. Nurhan Dunford

Oklahoma State University
Biosystems and Agricultural Engineering
Subject Area: Biological Sciences

Microalgae have received significant interest due to their potential as the feedstock for the production of biofuel and other bioproducts. Selecting the appropriate algae species is crucial for the success of microalgae production systems. Native algae strains tend to be more stable and adaptable for mass cultivation in regional conditions compared with non-native species. Seven algae strains isolated from the Great Salt Plains of Oklahoma, UTEX SP20, SP22, SP38, SP46, SP47, SP48, and SP50, were grown in 2 L bioreactors under controlled conditions of temperature, photon flux density, and aeration rate. The growth curves for each strain and chemical composition of algal biomass including oil, protein, ash contents and mineral compositions will be determined. Algal biomass of each species will be characterized by thermogravimetric analysis and differential scanning calorimetry analysis to evaluate their thermochemical properties. Strains with fast growth, high biomass, and high oil content will be identified and the biomass will be further investigated by using a microwave-assisted pyrolysis system. This project can contribute to the economical production of algal biofuel in Oklahoma.