Feasibility Study on Implementation of CA4PRS in Oklahoma

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Subject Area: Physical Sciences & Technology

Most state highways in the United States were built during the 1960s and 1970s and have now exceeded their design lives due to continuously increasing traffic demand. Recently, state transportation agencies are putting more efforts in restoring, rehabilitating, and restructuring highways instead of building new highway infrastructure. Selecting inappropriate closures can affect construction productivity, lead to poor construction quality, increase traffic delays and increase total cost. In order to help decision makers plan highway rehabilitation closures, this study presents the results of evaluating the implementation of a Computer Assisted Rehabilitation Decision Support System at the Oklahoma Department of Transportation (ODOT). To evaluate the applicability of the Construction Analysis for Pavement Rehabilitation Strategies (CA4PRS) software for reconstruction projects, this research presents a knowledge inventory survey conducted at ODOT. The survey was used to assess the usability of the tool in pavement rehabilitation projects in Oklahoma. Furthermore, two implementation studies were conducted in which the applicability of CA4PRS was evaluated and a simulation analysis technique was developed to enhance the efficiency of the program. Finally some recommendations have been made regarding ODOT's decision making process on determining closure plans.

Goal Multiplicity: A measure of multiple goal orientation

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Research has suggested that having multiple goals is a normal part of everyday life, but it can have costly effects on working memory. The present research focused on the assessment of a multiple goal orientation and sought to explore additional areas that may be affected by a multiple goal approach as well as identify benefits, if any, to utilizing this approach.

Postpartum Affect: Relations with Nutrition and Parenting

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Subject Area: Social Sciences

Studies have supported relations between maternal nutrition and affect and relations between maternal affect and parenting, but few have investigated direct relations between nutrition and parenting. Models linking all three variables are underdeveloped. Therefore, the current study investigated mediating and moderating effects of maternal affect on relations between nutrition and parenting. Mothers (n=60) at 3 months postpartum completed questionnaires regarding their dietary intake, parenting styles/attitudes, and affect. Biochemical measures of maternal micronutrient concentrations (i.e., iron and zinc) were assessed from intravenous blood samples. Correlations supported direct relations between nutrition and parenting. Authoritative parenting was related to total energy (r=.31, p=.024), vitamin B6 (r=.31, p=.026), selenium (r=.33, p=.018), and folate intake (r=.30, p=.032). Results supported previous studies demonstrating relations between maternal nutrition and affect [positive affect was related to maternal iron (r=.29, p=.028) and zinc concentrations (r=.26, p=.048)] and relations between maternal affect and parenting [permissive parenting was related to depression (r=.27, p=.040), negative affect (r=.31, p=.015), and distress (r=.33, p=.013)]. Given that the same measure of affect was not related to parenting and nutrition, mediator and
moderator analyses could not be conducted. Results suggest that parenting style is related to nutrition behavior, whereas affect is related to biochemical nutrient status.

**Case Study of Campus-Wide Emergency Alert Warnings: Oklahoma State University**

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**Subject Area: Social Sciences**

Using an incident that occurred near Oklahoma State University (OSU), we examine the efficacy of the campus alert system. There are many technologies used for mass alerts including, voice message, text, and email. Through a quick response questionnaire 1 week after the incident, we test for individual behavior, usage and helpfulness of the current alert system at OSU. Subsequent interviews with campus officials revealed specifics unique for the OSU campus that effect mass alert warnings, such as the type of incident and the rural location of the school. Based on effectiveness theory, these questionnaires and interviews will test the research question: Does the presence of an Emergency Campus Alert Systems impact student perception of safety? Our findings will provide valuable feedback to further aid in the policies and practice of emergency alert systems in higher education.

**The Utilization of Electronic Marketing Tools by Restaurants**

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**School of Hotel and Restaurant Administration**  
**Subject Area: Social Sciences**

According to Parsa, Self, Njite and King (2005), six out of 10 restaurants fail in the first five years. One of the major reasons for this failure is lack of marketing the restaurant. Technology plays an important role in marketing efforts. E-Marketing specifically became a significant marketing tool for restaurants. Therefore, the purpose of this study was to examine the utilization of e-marketing tools by U.S. restaurants and the importance of them for marketing efforts. A random sample of 2000 restaurant managers was surveyed from Hospitality Technology Magazine subscribers. 297 restaurant managers responded to the survey. According to survey results, the most frequently utilized e-marketing tools are 1) Social Networking Tools (e.g. Facebook), 2) Include website address in email signature, 3) Actively monitor the social network chatter (e.g. checking your restaurant's comments in customer review website), 4) Register with search engines, 5) Actively participate in social media efforts. The least utilized tools are: 1) Audio or Video Podcasting, 2) Web seal certification, and 3) Virtual tours, 4) Cell Phone messaging, and 5) Advertise in online blogs. In terms of the impact of these e-marketing tools on marketing efforts, "Actively monitor the social network chatter" was ranked the highest, followed by "Social Networking Tools (e.g. Facebook)", and "Actively participate in social media efforts". The results indicate that while restaurateurs take advantage of mainstream e-marketing tools, there are potentially effective tools that are underutilized.

**Flow patterns and void fraction in vertical upward and downward two phase flow**

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**Subject Area: Physical Sciences & Technology**

The two phase flow phenomenon is of significant importance in chemical and petroleum industries. To have a clear understanding of the phenomena, experimental investigation of air water two phase flow was carried out in a 0.0127 m diameter tube for vertical upward and downward orientation. The experimental study
consisted of the flow pattern visualization and measurement of the void fraction data. A total of six flow patterns were recognized in vertical upward and downward flow. A careful observation of flow patterns in either orientation revealed that though the upward and downward two phase flow shares some common flow patterns, the distribution of the discrete phase across the pipe cross section is distinct for the two orientations. The physical mechanism governing the differences in the flow pattern appearance for the two orientations is explained in the present work. The drift flux model is discussed to get the physical insight of and take into account the higher values of void fraction in downward flow. Finally the void fraction correlations available in the literature are analyzed against the available experimental data to identify the best performing correlation to predict void fraction in vertical upward and downward two phase flow.

Ruminal temperature response to ambient temperature in beef cows
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Subject Area: Whiteman Award Presentation
Ruminal temperature (RuT) is a measure of core body temperature. Exposure of cows to elevated ambient temperature may influence usefulness of RuT to predict physiological events. The objective of this study was to evaluate the effect of ambient temperature on RuT in beef cows. Angus cows (n=12) were administered temperature boluses (SmartStock, LLC) which were programmed to transmit RuT every hour. Ruminal temperature was collected in January, June and August. Hourly ambient temperature (www.mesonet.org) ranged from 2 to 20°C in winter and 11 to 37°C in summer. Data were analyzed with GLM and CORR (SAS Inst. Inc., Cary, NC). Ruminal temperature increased when ambient temperature was greater than 32°C. Respiration rate (RR), rectal temperature (RT), and RuT were evaluated on two consecutive days when maximal ambient temperature was 37 (HOT) or 27°C (WARM). Ruminal temperature, RR and RT were greater (P < 0.05; 40.2 ± 0.1°C, 114 ± 3, 40.8 ± 0.1°C, respectively) on the HOT day compared with the WARM day (37.5 ± 0.1°C, 36 ± 3, 38.1 ± 0.1°C). Ruminal temperature was correlated with ambient temperature, cattle temperature humidity index, RR and RT. Use of RuT for prediction of physiological events may be influenced by elevated ambient temperature.

The Association between Parent Psychopathology and Adolescent Adjustment: An Examination of Moderators
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Department of Human Development and Family Science
Subject Area: Social Sciences
While studies have established a link between parental psychopathology and child outcomes, less is understood regarding potential moderators of this association. We first examined whether parental psychopathology was related to adolescent adjustment. Next, we investigated whether parental involvement, child age, and child sex moderated this relation. Parents provided information on their own antisocial behavior and depression. Adolescent adjustment was based on parent and youth reports. Youth depression was based on self-reports. Results indicated that high levels of parent antisocial behavior were related to high levels of youth antisocial behavior and poor emotion regulation and low levels of GPA. The findings also demonstrated that parent antisocial behavior was more strongly related to youth antisocial behavior, poor emotion regulation, and GPA for males compared to females, for older youth compared to younger adolescents, and for high parental involvement families compared to low parental involvement homes. Also, parent depression was more strongly related to youth depression for females compared to males and for younger adolescents compared to older youth. In sum, the findings suggest that the influence of parental psychopathology on adolescent adjustment may vary depending on age and sex and on how often the parent and youth spend time together.
The New Generation of College Students
Bradley Brooks, Dr. Nicole Judice Campbell and Dr. Lisa Portwood
Scholar from the University of Oklahoma
Scholar Symposium Participant
Subject Area: Education

Can you find a simple definition of a first-generation college student? Is it not having any postsecondary education in both the paternal and maternal family lineage? What about parents having an associate's degree, but no bachelors? We have all heard that the transition from high school to college academia is tough. While this is true, it seems that this issue deserves special attention in relation to first-generation college students, beginning with the development of a coherent definition of this population. The current cognitive theories of a college student's progression through academia focus only on a single college student group: the "traditional" student. Today's student mix is uniquely complex and is composed of many other demographics, such as non-traditional college students along with students from an increasing diversity of ethnic and cultural backgrounds. At many postsecondary institutions, faculty and college administrators are not even familiar with the term first-generation. How are we to accurately accommodate these students if we do not understand who they are? This presentation will consider these questions through the lens of currently available theories and literature, as well as describe upcoming research plans to add to the body of work in this area.

Observation Oriented Modeling: A More Suitable Means for Data Analysis
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Subject Area: Social Sciences

According to classical measurement theory, attributes must possess quantitative structure (e.g., continuity, additivity) to be considered measurable. Yet, attributes in psychology have not been demonstrated to possess quantitative structure, although the commonly employed data analysis techniques assume such quantitative structure. Observation Oriented Modeling (OOM), an alternative, person-centered analysis technique, is more suitable for data in the social sciences in that quantitative structure is not assumed. The goal therefore shifts from estimating abstract population parameters for ostensibly measured attributes to estimating the accuracy of data classification based on patterns of observations. This brings the individuals in the study to the forefront of the analysis and encourages researchers to move beyond the variable-based modeling ritual. In this study genuine data regarding the development of relationship competence were analyzed using both traditional techniques and OOM. The results revealed the inconsistency that frequently occurs between traditional aggregate-level analyses that assume quantitative structure and the person-centered approach of OOM. Although the model was statistically significant at the aggregate level, less than one-sixth of the sample fit the hypothesized model. It is recommended that alternative analysis techniques such as OOM be used in the social sciences because they more accurately reflect the attributes under investigation.

Slim Pickens: Food Accessibility in Oklahoma City, OK
Stacey Brown
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Subject Area: Social Sciences

Neighborhood health is influenced by many different factors, including environmental, contextual, and compositional. One possible mechanism that influences health of a neighborhood is availability of healthy food. If healthy food is unavailable or difficult to acquire, people will be forced to eat unhealthier options which can increase their vulnerability to diseases such as diabetes and obesity. In order to understand if this
is occurring, this research will analyze supermarket accessibility for residents in Oklahoma City, Oklahoma. The purpose of this research is to analyze the varying levels of accessibility and identify any 'food desert' locations as well as compare prices throughout the MSA. Because there is no definitive measure for determining food deserts, four different measures of accessibility were used in this study. Each measure created an index of accessibility at the tract level, which can then be mapped to highlight any spatial variation. In addition, an analysis of food prices was also conducted to determine if grocery stores vary in their food prices in the MSA. Accessibility was found to vary considerably across the MSA and food prices were more expensive in the high minority tracts.

Fatty acid profile and meat quality analysis of pasture vs. concentrate finished beef


Oklahoma State University
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Subject Area: Whiteman Award Presentation

The health advantages of grass finished beef compared to concentrate finished beef include increased monounsaturated fatty acids (MUFA), polyunsaturated fatty acids (PUFA), conjugated linoleic acid (CLA), and an improved omega-3 to omega-6 fatty acid ratio. In humans, these benefits decrease the risk of metabolic disorders including coronary heart disease, diabetes, obesity, and various cancers. Muscle and subcutaneous fat samples were taken at slaughter from 100 heifers finished on concentrate and 60 heifers finished on pasture. Fatty acid profiles were characterized using gas chromatography fatty acid methyl ester (FAME) analysis at Iowa State University. Meat quality and trained taste panels were conducted on steaks from Longissimus muscle at Oklahoma State University. Data were analyzed to determine the effect of diet and tissue using the PROC GLM and CORR procedures in SAS (SAS Inst. Inc., Cary, NC). Intramuscular samples from grass finished heifers had a higher percentage of omega-3, linoleic, PUFA, CLA, as well as an improved atheroindex and omega-3 to omega-6 fatty acid ratio (P<0.05). Concentrate finished heifers had a higher carcass weight, marbling score, yield grade, internal fat, and larger rib eye area (P<0.05). Percent MUFA and PUFA in intramuscular tissue also had a moderate correlation with marbling score (P<0.05).

African American Adolescent Females’ Perceptions of Female-on-Female Violence in Kansas City

Patrice Buckner, Dr. Tashel Bordere
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Scholar Symposium Participant
Subject Area: Minority Issues

Violence among African American adolescent females is increasing both in occurrence and visibility. In particular, youtube.com videos featuring fighting among African American teenage girls are bringing the phenomena to the forefront. Research on adolescent violence has focused on the frequency of violence without looking at perceptions of violence and has been targeted towards males, specifically African American males. The purpose of this study was to explore African American adolescent females’ perceptions and experiences of female-on-female violence and how it impacts how they live their day-to-day lives. In-depth Interviews were conducted with 8 African American adolescent females ages 11-14 to examine their perceptions and experiences with violence of violence. Prior to each interview, participants viewed two YouTube video clips of African American teenage girls engaged in a fight. Following the videos, participants were asked general questions about their reactions to the images of their peers participating in fighting behavior. The central question asked of the participants was, “What is it like to see the African American teenage girls fighting each other on YouTube?” Findings revealed that the teens had negative views both of the fighting in the videos and fighting in their schools and communities. However, it was the consensus across participants that an audience, whether a virtual audience on youtube.com or a live audience, was key to establishing credibility and ensuring protection from future assaults in violent settings. Participants described the purposes of fighting as a means of a) establishing credibility b) avoiding
victimization (e.g., being bullied); and/or duty as a part of c) gang affiliation. Information learned from this study has implications for researchers, educators, parents, law enforcement, school administrators and personnel, policy-makers, and other helping professionals.

**Explanation for observed oscillation in thermal bistability in optical microresonators**

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Department of Physics  
Subject Area: Physical Sciences & Technology

In this work, we investigate the frequency oscillation of an optical microresonator mode due to thermal effects. Using a tunable diode laser, we excite the whispering gallery modes of a glass microsphere by coupling light in from a tapered optical fiber tangent to the microsphere. Absorption of some of the light in a whispering gallery mode heats the microsphere and shifts the mode's frequency to lower values. Therefore, the optical throughput power depends on the laser frequency scan direction. This direction dependence is called thermal bistability. If the laser frequency is scanned in the direction of decreasing frequency, the whispering gallery mode frequency is sometimes observed to oscillate. The oscillation phenomenon happens due to two competing effects: heat transfer from the mode volume to the rest of the sphere, and a time delay in the response of the refractive index to changing temperature. The properties of this oscillation are found by fitting the experimental data to a computer model.

**Digging Beneath the Surface: Analyzing and Understanding Urban Concentrated Poverty Among African Americans in Kansas**

**Yolanda Byers, Carolyn Shaw, Ph.D.**  
Scholar from Wichita State University  
Scholar Symposium Participant  
Subject Area: Social Sciences

The epidemic of urban concentrated poverty has plagued African American communities for many years. This research explores and seeks to explain the underlying causes of this complex and multifaceted issue. Using "The State of Black California 2007" report as a model, this research examined the economic standing of African Americans in the five Kansas counties: Leavenworth, Johnson, Sedgwick, Shawnee, and Wyandotte. In order to create an economic index, this study uses a variety of key measures including household median income, unemployment rate, and poverty rate. Obtaining the raw data from the U.S. Census Bureau 2006-2008 and the Kansas Department of Labor reports for 2008, this research compares the findings for blacks, Asians, Hispanics/Latinos, and whites and used the location quotient formula to create a weighted average index and determine the economic status for each group. Ultimately, these numbers are used to discover the overall economic standing for each racial group. This study synthesizes the data gathered with an extended literature review to help facilitate analysis and concludes with some policy proposals to improve the socio-economic standing of African Americans in Kansas.
The Biological Effects of Deposited Radionuclides

Sajar Camara, Dr. Ralf Sudowe and Arthur Myers, Faculty Mentors

Scholar from the University of Nevada Las Vegas
Scholar Symposium Participant
Subject Area: Biomedical Sciences

Las Vegas is among major cities concerned with air quality. One of the major causes of air pollution in our valley is dust emission. This could be due to natural emissions caused by wind erosion or traffic-related emissions such as off-road vehicle (ORV) driving.

According to a recent survey by Goosens and Buck (2009a), off-road driving was found to be a “significant source of dust” in and around Las Vegas. A study conducted on soil samples from Nellis Dunes Recreation Area (NDRA), an off-road vehicle driving spot 15 miles North-East of Las Vegas, indicated the presence of radionuclides such as Ac-228, Pb-212, Bi-212, Th-231, Th-232, Cs-137 and K-90 (Sudowe et al).

Off-road driving activities at NDRA will create dust particles that might be inhaled and cause respiratory diseases such as asthma and other upper respiratory diseases (Rothe, T. 2008; Gent, 2009). If the soil creating the dust has radionuclide concentrations that might be harmful to our health, will these dust samples also have the same radionuclides? If they do, what would that mean to our health and environment and how can we best determine our results? Two methods of sample analysis were employed to determine the outcome.

Organic Catalysis Using Titanium Coated Silica Gel

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Subject Area: Physical Sciences & Technology

Catalysts have a wide variety of application in chemistry and serve as the bases of many of the industrial synthesis of synthetic chemicals today. A catalyst was prepared using a titanal sulfate and sulfuric acid solution and then coated on coarse silicon dioxide as a support. The titanium coated Silica Gel was used as a catalyst to convert both benzyl phenyl ketone and diphenylacetylene to benzaldehyde. In the process multiple intermediates are formed including benzil and benzyl phenyl ketone in the case of diphenylacetylene. This discussion will cover the kinetics, possible reaction pathways, and other similar systems of this titanium catalyst.

Utilization of Biomass at the University of Central Missouri: Toward a Carbon Neutral University and a Sustainable Future

Tony Cardozo, Dr Scott McKay

Scholar from the University of Central Missouri
Scholar Symposium Participant
Subject Area: Biological Sciences

The University of Central Missouri (UCM) is located in Warrensburg Missouri. There is a great deal of interest in biofuels in the region evident by biomass to fuel facilities in Malta Bend and Centerview, which are in close proximity to UCM. Five areas of the UCM campus are being investigated for potential biomass production: UCM proper (58 acres plus 35.7 acres for the south athletic fields), Pertle Springs (489.7 acres), Sky Haven Airport (748.4 acres), Mitchell Farm (122.7 acres), and Prussing Farm (90.5 acres). The acreages were found using GIS analysis and the “improved” areas were eliminated from the total available acreage. The potential energy that UCM could produce and the cost savings realized from farmgate prices were estimated using data generated and/or recent literature. From the calculations, UCM could potentially produce ~ 35 million total kWh per year from the biomass produced at an estimated cost of $.011/kWh. The potential energy produced is more than double what UCM currently consumes. UCM would also be able to
sequester more than 1,000 tons of carbon per year. This study shows that UCM has the resources to produce massive amounts of energy, and can sequester enough carbon to be virtually carbon neutral.

How African American Males experience college and discovering ways to improve retention rates among the minorities

Zandra Carroll
Scholar from the University of Arkansas, Little Rock
Scholar Symposium Participant
Subject Area: Minority Issues

As the population across the United States becomes more diverse, institutions of higher education are coming to the realization that they are inadequately prepared to teach or understand the demands of racial, cultural, linguistic, and at risk minorities. In recent years, the increase of college enrollment has challenged institutions of higher education to address the needs of minorities both educational and cultural on a broader basis. The study of retention, recruitment, and restructure for minorities was manifested by the overwhelming number of high school dropouts, the disproportionate representation of minority students in higher education, and society’s inability to positively empower the next generation. On the Campus of University of Arkansas at Little Rock, minority students make up over 30% of the population and less than a quarter of that cohort is retained during their freshmen year of college. In a peer-to-peer institutional analysis, 18 percent grand total of males enrolled at UALR completed their first bachelor’s degree in a six year rate. In that six year rate, less than 6% of African American males successfully completed their first bachelor degree. This study will create an opportunity to quantitatively evaluate an educational intervention program, designed to reduce the attrition of minorities in higher education. The researcher will examine how African American males experience college, explore ways to retain them, and suggest different effort to help educators implement a more effective program that will increase retention. There are several factors that lead to the success or fail efforts to increase retention rates in minorities. Some efforts include: a high level of institutional commitment, dedication of faculty/staff, as well as stronger programs that promote student involvement and entertainment. Some speculated that the characteristics of successful and failed retention efforts lie solely in the individual students, the institution, and federal funding. The notions of cultural differences and similarities continue to be major concerns for society. From our study, we hope to help develop ways to enhance and empower, Campus Advisors, Educators, Campus Activity Council, Humanitarians, Students, and Minorities that are transitioning to college.

Evaluation of the Antimicrobial Effect of 1% Ammonium Hydroxide Brine Applied Through Needle Injection into Striploins

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Subject Area: Whiteman Award Presentation

Four studies were conducted to determine whether ammonium hydroxide (AH) possesses an antimicrobial effect when injected into meat. First, striploins were injected with 1% AH-brine or a commercial phosphate-based-brine, and MAP-packaged. AH-steaks had lower psychrotrophic, mesophilic, and gram-negative counts than phosphate-steaks. Subsequent studies were focused on the pathogen Escherichia coli O157:H7. A multi-nozzle spray system was used to spray water, 1%, 2%, and 3% AH solutions onto inoculated meat-disk-samples with E. coli O157:H7. All AH-solutions were effective in reducing E. coli O157:H7 compared to the control (water) and its effectiveness increased with time. Next, striploins were pre-cored and inoculated with E. coli O157:H7 before they were injected with 1% AH-brine and then stored aerobically. No-differences were found between AH-brine and control (no-AH brine) on days 0 and 1. Therefore, another study evaluated E. coli O157:H7 reductions over time. There was no-treatment effect; however there was a day effect on E. coli O157:H7 reductions (from ~0.3 log10 cfu/cm2 on day 0 to ~1.4 and ~1.6 log10 cfu/cm2 on days 4 and 9). The pH was not correlated with bacterial reductions. In
conclusion, 1% AH-brine appears to not impact E. coli O157:H7 any differently than controls under the conditions of these studies.

Are we in this together? Partnerships between academic advisors and advising administrators and their relation to advisor job satisfaction

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Subject Area: Education

This study examined the relationship between professional academic advisors' job satisfaction and perceptions of respect by administration, involvement in decision making, and autonomy. 290 professional academic advisors from 41 public FT4/MS/HTI Carnegie classified institutions participated in the quantitative study that used a researcher-created instrument. The statistical procedure used was the Pearson r correlation and t test to investigate moderately positive correlations. Correlations in the areas of respect by administration, involvement in decision making, and autonomy showed a significant, positive relationship with satisfaction with the current advising position (job satisfaction). Weaker correlations were displayed between respect by administration, involvement in decision making, and autonomy when correlated with satisfaction with the advising profession (professional satisfaction) and intent to make a career out of academic advising.

Achieving Lean Initiative through RFID: A Simulation Study

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Subject Area: Physical Sciences & Technology

Organizations are struggling to make tough decisions on investments in RFID technologies. Selected retailers are embracing the technologies in retail supply chain but the decisions to employ it in manufacturing settings are even more complicated. This study explores how RFID and lean can be complementary and examines whether or not more accurate information through RFID-based solutions on the item level can improve the overall manufacturing plant performance. We employ a dynamic system simulation to assess the value of RFID deployment. The results demonstrate the value of employing RFID in lean manufacturing initiatives.

Religious Coping Strategies, Alcohol Use, and Symptoms of Posttraumatic Stress among Trauma-Exposed College Students

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Subject Area: Social Sciences

The current study investigated associations among religious coping, alcohol consumption and related problems, and symptoms of Posttraumatic Stress Disorder among college students. Three-hundred ninety-five participants completed a web-based survey on their exposure to trauma, levels of alcohol use and related problems, symptoms of PTSD and use of both positive and negative religious coping strategies. Results indicated that participants who utilized more positive religious coping strategies demonstrated less alcohol consumption and alcohol-related problems. Participants engaging in more negative religious coping methods reported more PTSD symptoms. Findings from the current study suggest that attempts at religious
coping may serve as both a protective and risk factor in regards to both alcohol-related and mental health problems in the wake of traumatic experiences.

**Parental Psychological Control, and Adolescent Adjustment: the Partial Mediation of Adolescent Emotion Regulation**

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

Psychological control is a universal intrusive parenting practice, which has been linked to adolescent academic achievement, internalizing and externalizing behavior problems. Adolescent emotion regulation problems have also been linked to academic, behavioral and psychological maladjustment. The present study investigated whether parental psychological control is associated with adolescent emotion regulation, and whether emotion regulation functions as a mediator between parental psychological control and various adjustments. This study of 152 adolescents and their parents found that higher levels of psychological control were associated with higher levels of adolescent sadness inhibition and anger dysregulation, poorer anger coping, lower grades, more antisocial behavior and depressive symptoms. Higher levels of adolescent anger dysregulation were associated with poorer grades, more antisocial behavior and depressive symptoms after controlling for parental psychological control. Higher levels of anger coping were associated with less antisocial behavior, and less depressive symptoms when parental psychological control was controlled. The results of Sobel’s tests revealed that anger dysregulation and coping partially mediate the effects of psychological control on adolescent development outcomes. Parental psychological control has both direct effect on adolescent academic, behavioral and psychological adjustments, and indirect effects through adolescent anger regulation.

**Characterizing the Strength of Fluorinated Epoxy-Carbon Fiber Interface as a Function of Moisture Absorption**

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Subject Area: Physical Sciences & Technology

This paper characterizes the interfacial properties in carbon fiber reinforced fluorinated epoxy composites. The epoxy system used in this study is Fluorinated tetra-glycidyl methylene di-aniline (6F-TGMDA), which shows highly reduced moisture absorption alongside superior mechanical properties, like high elastic modulus and fracture toughness. The hydrophobic nature of this epoxy makes it a potential fiber-coating agent in aerospace applications. However, its compatibility in carbon fiber-reinforced composites remains to be investigated. Characterization parameters for the fluorinated epoxy-carbon fiber interface, like true interfacial strength estimated from the microbond test proved to be inadequate since it assumes a uniform distribution of stresses along the embedded fiber length. It does not account for stress distribution or any residual stresses present at the interface. These stresses arise due to thermal expansion differences of the fiber and matrix during curing. To account for these pre-existing normal pressures, we calculate adhesion pressure at the interface, which requires determination of the mechanical and physical properties of the resin. Here, we determine creep compliance behavior and hence, relaxation modulus of the epoxy using Nano-indentation and Coefficient of thermal expansion of the epoxy using Coherent Gradient Sensing. The interfacial adhesion post moisture degradation is also studied.
Effects of in ovo exposure to an estrogenic chemical on growth and development of western fence lizards.

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Subject Area: Biological Sciences

Many tons of pesticides and herbicides are used in the USA each year and some contain chemicals that mimic hormones, including estrogen. Some of these chemicals can persist for long periods in soil where embryonic lizards may be exposed during development because many lizards bury their eggs in the substrate for incubation. In an effort to better understand the environmental consequences from exposure to estrogenic chemicals during embryonic development of lizards, we administered two doses (0.001 or 0.000001 µg/egg) of 17α-ethinylestradiol to western fence lizard (Sceloporus occidentalis) eggs 7 days post oviposition. The eggs were incubated at 26 °C and hatched after an incubation period of about two months. At hatching, neonates were weighed, measured, and sex was determined by secondary sex characteristics. Thereafter, hatchlings were measured and weighed at monthly intervals until they reached maturity at about 6 months old. In ovo exposure of 7-day old embryos to 0.001 µg 17α-ethinylestradiol per egg caused all male embryos to develop into phenotypic females and post-hatching growth was affected. However, as the hatchlings grew to maturity, some did develop male secondary sex characteristics, indicating that complete sex reversal did not occur.


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Subject Area: Social Sciences

Customer segmentation is a significant business investigation tool which allows organizations to build customer profiles and plan marketing efforts to satisfy the varying demands of different segments. The objective of the present study is to empirically explore the concept of probabilistic-D Clustering for segment profiling in a B2B (business-to-business) market. A SAS macro is developed and reported that can be used on any data set for application of this technique. To the best of our knowledge, probabilistic-D technique has never been empirically tested in a business setting. It was compared with the widely used k-means clustering technique. Findings indicate a better explanation of customer segment profiles using probabilistic-D clustering. These observations are likely to be less responsive to the marketing efforts directed towards relevant k-means segments. Using a probabilistic-D Clustering approach these observations can be targeted differently to improve the usefulness of marketing communiqué and promotions.

How microorganisms are distributed among plants? -- A study of plant endophytic bacteria using T-RFLP

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Subject Area: Biological Sciences

Plant-associated bacteria may play an important role benefiting plant growth, or may be pathogenic to plants or organisms that consume those plants, so a general understanding of plant endophytic microbial communities and their diversity is necessary. An interesting question is how the distributions of these bacteria vary with location, with plant species, with individual plants and with plant growing season. To study this question, plant samples were collected from The Tallgrass Prairie Preserve, Pawhuska Oklahoma. After surface sterilization, total plant DNA were extracted using CTAB buffer method and then PCR with
gel electrophoresis using universal 16S rDNA primers (799F+1492R) separated successfully a fragment of bacterial 16S rDNA. Mono-digestion T-RFLP with restriction endonuclease DdeI was used here to resolve the structures of endophytic bacterial communities. Data were analyzed using SAS 9.1 2-way ANOVA test, R and CANOCO. Results indicate that all of the three major factors including host plant species, sampling time and host locations have significant impacts on the distribution of endophytic bacteria. This project also indicates that mono-digestion T-RFLP is a powerful tool to distinguish endophytic bacterial communities from different host environments. Prominent T-RFs are also recognized for each host plant species, and used to inspect the dynamics of endophytic bacterial communities.

Eye Movement Desensitization and Reprocessing: An Eye Moving Exploration

Veronica Ealey Pyles, Orren Dale, Ph.D.
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Scholar Symposium Participant
Subject Area: Social Sciences

Eye Movement Desensitization and Reprocessing (EMDR) is a widely used treatment for Post-Traumatic Stress Disorder (PTSD). This survey examines therapists' perceptions of its effectiveness based on the client's problem, the therapist's discipline, and treatment setting variables. There has been debate regarding the effectiveness of EMDR due to variations in the application of the technique. An online survey was conducted using a sample of convenience. Twenty-five clinicians were originally contacted and were asked to complete the survey. In addition, in order to increase sample size, each clinician was asked to provide the name of other clinicians who use EMDR. This snowball method was used to increase sample size. Survey results indicate that respondents perceive EMDR to be very effective, with 83% of the clinicians saying they will most likely use it in the future. The study also compared EMDR to other forms of therapy, such as Cognitive Behavioral Therapy (CBT) and Relaxation, and EMDR was found to be as widely used as those other methods. In the future, a larger sample size can be used to examine other variables affecting the use of EMDR with PTSD sufferers.

Comparison of Preferred and Active Body Temperatures of Sceloporus malachiticus from High and Moderate Elevations in the Talamanca Cordillera of Costa Rica

Rachel Eguren
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Scholar Symposium Participant
Subject Area: Environmental Sciences

A temperature study was run using Sceloporus malachiticus in order to determine if there is a difference between active body temperature (ABT) and preferred body temperature (PBT) between two populations. Temperatures were taken to determine the ABT while lizards were noosed and brought into the lab to determine the PBT. When S. malachiticus were compared using active body temperature and preferred body temperature from elevations of 2200 and 3400 meters no significant difference was found. The mean ABT from the high elevation was 24.78°C and the moderate elevation was 28.36°C. The mean PBT from the high elevation was 31.22°C and the moderate elevation was 32.19°C. Comparing the ABT and the PBT from the same elevation a significant difference was found at both elevations (t test, P < .05). Lizards we observed in the field to find ABT and in the lab to find PBT. It cannot be determined whether a biological problem is the cause for the general decrease in lizard body temperature as elevation increases. Environmental conditions affect the amount of time a lizard maybe able to spend at its PBT which affects its uptake of energy which in turn affect all other physiological functions.
Fabric Dyeing & Reflection: The Development of Hands-on Fiber-to-Dye Learning  

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Department of Design, Housing & Merchandising  
Subject Area: Education

Oklahoma State University's department of Design Housing and Merchandising holds a national reputation for functional design and textile science. The purpose of this study was to investigate the learning potential of adding a hands-on dyeing procedure to the current lab coursework. Scores from students' quizzes and exams served as the comparison for success of the experimental laboratory study.

Textile lab instructors have the responsibility of preparing students to understand dyeing concepts so that when they advance onto higher courses where they will be creating their own fabrics, or working for a company where they will be placing orders for thousands of garments, they can accurately pair the correct dye number, bath pH level, and fiber content so that the end dye result will be correct for the supplier and/or the customer.

Students struggle with dyeing concepts mainly because there is difficult chemistry involved. By incorporating a hands-on dyeing learning procedure into the lab portion of the course, students were able to see dye/color acceptance (or lack of acceptance) on different fiber types and form connections between the specific dye, pH level of dye bath required for the dye, and different fiber types learning the necessary environments for ideal dye/color acceptance.

Order This, Not That: Does Nutrition Information on Restaurant Menus Influence Food Choice?  

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Oklahoma State University  
Department of Agricultural Economics  
Subject Area: Social Sciences

With obesity and other diet-related diseases on the rise, health and nutrition are worldwide concerns. To encourage healthier food choices, the U.S. government recently mandated that nutrition information be provided on restaurant menus by 2012; however, the effects of the legislation are currently unknown. This study uses an experimental design carried out in an actual restaurant setting to test three menu labeling formats (symbolic, numeric, or no nutritional information) to determine which menu(s) lead people to select lower calorie menu items and which variables affect consumers' food choices. Results show menus which provide nutritional information do in fact reduce the total number of calories ordered, with the greatest reductions occurring from the symbolic menu. Additionally, consumer choice is significantly influenced by a menu item's price, caloric content, menu format, and party size. The results suggest that the proposed regulation will lead to lower calorie choices in restaurants at least in the short run.

Evaluation of hormesis on the response of soilborne plant pathogens to pesticides in vitro.  

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Department of Entomology and Plant Pathology  
Subject Area: Biological Sciences

The adaptive dose response characterized by stimulation at low doses and inhibition at high doses of an agent on an organism is known as hormesis. A method has been developed for evaluating the hormetic effect of low doses of fungicides on the radial growth of plant pathogens in vitro. The fungi Rhizoctonia solani and Rhizoctonia zeae were tested against propiconazole while the oomycete Pythium aphanidermatum was tested against cyazofamid and propamocarb. A benchmark dose value (BMD), was
determined for each chemical. Each organism was grown on solid growing media amended with the fungicides at different doses, with a minimum of five doses below the BMD, and a non amended control. The modeling of the hormetic effect and the inference of EC50 and NOAEL were done using a Brain-Cousens model. Hormetic responses were observed on the dose effect of cyazofamid and of propamocarb on P. aphanidermatum. In contrast, propiconazole didn't show a hormetic effect on either R. zeae or R. solani. An accurate experimental design and a sensitive data analysis tool were necessary to detect the hormetic response consistently. This study provides evidence that the phenomenon of hormesis occurs in oomycete plant pathogens in response to subinhibitory fungicide doses.

%GetTweet: A New SAS Macro to Fetch and Summarize Tweets

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School of Management Science and Information Systems
Subject Area: Physical Sciences & Technology

The role of Twitter as a source of valuable information for spotting trends has been much talked about in the popular press. Twitter's open API availability makes it one of the most sought after platform for textual data analysis. While SAS Text Miner provides a robust method for analyzing textual data; the challenge remains to fetch customized tweets and clean textual data before any text mining.

This paper develops and discusses a new SAS macro that can be used easily to fetch the Tweets a researcher wants from Twitter by simply typing in search words or phrases as it is usually done in any Advanced Search Query. The macro uses Twitter's search API and HTTP procedure in SAS to create a dataset of Tweets customized using parameters such as combination of keywords, exact phrases, omission of specific words, and so on. The macro also purges terms such as http-tags, URLs, etc. that may create problems in text mining. Visual Analysis of retweets to identify influencers via Network Visualization graphs available in SAS/GRAPH is shown.

Elementary Education in India and the Impact of a Government Policy

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Subject Area: Education

This paper exploits the rollout of the National Policy for Education of Girls at the Elementary Level (NPEGEL) in India as a policy experiment to assess the effectiveness of national policies in raising girls' educational achievement and closing the educational attainment gap between boys and girls. NPEGEL was first implemented in 21 states in India in 2003 and aimed at improving the educational infrastructure in schools in areas with at least 5% population belonging to the backward communities or lower castes and less than 10% female literacy. Using data from two Demographic and Health Surveys in 1998-99 and 2005-06 and restricting attention to school age children, i.e. the 6-14 age group, three years after the program was implemented, I find that that the program raised the probability of enrollment of boys aged 6-9 years from lower castes by around 6%, but did not have any significant effect on girls' enrollment in these communities. In contrast, enrollment increased for girls from non-backward groups. The findings point towards a nuanced impact of the program: it benefited boys from lower castes, and girls from upper castes. This implies that the program maybe closing the gender gap among the upper caste communities, and widening it among the lower caste communities.
Fra le linee: The Frame Narrative as Folklore in Boccaccio's The Decameron

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Scholar Symposium Participant
Subject Area: Humanities

The purpose of this study was to qualify Giovanni Boccaccio's frame narrative The Decameron as folklore in order to examine its influence on the Renaissance period, as well as to understand the society and author which produced this book. This research identified motifs in the work as well as studied its folkloric performance in order to prove its position as folklore. The histories of Florence, the Bubonic Plague, Boccaccio and the Renaissance provided contextual information that informed the research as well. The researcher concluded that the criteria for inclusion as folklore are not only merited, but essential for the understanding of the work. Understanding the worldview of the people into which the literature is disseminated not only assists in gauging what the probable reception might have been, but also how their schema would have influenced the work itself. The themes of love, humanism, politics, religion, and knowledge for knowledge sake are not only espoused by Boccaccio, but are then reflected in the Renaissance movement that would swiftly follow. The contention of this researcher is the combination of folkloric measure, motif identification, and contextualization are necessary for a more complete appreciation of the work.

SOCIAL METRICS AND OPTIMIZATION OF PROCESSES FOR SUSTAINABILITY

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Subject Area: Physical Sciences & Technology

Over the past decade, the definition for sustainability has changed from being environmental and economical concerns to also include social relevance and benefit. Measuring sustainability (after the fact) and designing for sustainability (conceptional stage) are altogether different. Apart from the numerous process and economic parameters we now also need social and legal parameters to be developed and incorporated into process design. However, the development of social metrics and their evaluation present challenges. This research seeks to integrate a forecasting methodology for evaluating legal risk and water use into and Excel based SUSTAINABILITY EVALUATOR (SE) developed at Oklahoma State University (OSU). Legal risk of a process is identified by using an excel database of Federal Laws and Environmental Protection Acts. Water use impact is achieved by using a database of the United States Geological Survey (USGS) data of aquifers. Further, using a Minimization of Single-Objective Optimization Problems (MINSOOP) technique, developed by Fu and Diwekar, this work optimizes chemical manufacturing processes simulated in Aspen Plus to meet sustainability criteria. To validate this research, the SE developed by OSU is applied to an allyl chloride manufacturing process and a combined heat and power plant. As a result of this work a computer aided tool is being developed for use by process designers and process evaluators such as regulatory organizations to evaluate and optimize for sustainability.

Effects of Melatonin on Caenorhabditis elegans neurons in primary cell culture.

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Scholar Symposium Participant
Subject Area: Biomedical Sciences

Melatonin (MEL) is well-known for its role in circadian rhythms, but it may also regulate neuronal plasticity in learning and memory pathways. The goal of this study is to determine the effects of melatonin on neuronal growth and development in primary cell cultures obtained from Caenorhabditis elegans embryos. After five days of growth in liquid media, wild type worms were harvested and the eggs released by hearing
worms in NOH/bleach solution. Egg shells were removed with Chitinase and the cells dispersed through a large-pore filter. The embryonic cells were incubated on chambered coverslips in L-15-10 media containing melatonin dissolved in either DMSO or ethanol, or in L-15-10 media containing only the solvent. Cells were imaged over a ten day period on an inverted microscope equipped with a digital camera. Neurons were most numerous in the media containing 1mM melatonin in 1%DMSO. Neuronal processes were also longer in this treatment. A higher concentration of melatonin (10mM) caused processes to be shorter and less numerous. The ethanol solvent had a negative effect on neuronal growth regardless of the presence of melatonin. Since low concentrations of melatonin appear to stimulate axonal growth in developing neurons, we are using mutants with potential melatonin receptor defects to determine if this is a receptor-mediated response or simply a result of natural antioxidative properties of melatonin.

Native Literature in "Native America"

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Scholar Symposium Participant
Subject Area: Humanities

Before this semester, it had never occurred to me that there was a distinct need for Native books by Native authors. I assumed that if there were books about Native people, these books would, naturally, be written by individuals who had the personal experiences of being Native and could accurately relate these experiences through literature. Apparently, my assumption was wrong. Much of the literature that depicts Native peoples, themes, traditions, etc is written by non-native authors who often lack the knowledge and sensitivity to write about these topics accurately. Living in Oklahoma, this seemed odd. It is certainly ironic. After all, Oklahoma is “Native America”; it even says so on our license plates. We advertise and promote the overwhelming presence of Native culture in our state, yet leave the need for true Native literature unfulfilled. Even worse, we allow harmful stereotypes presented in books to be perpetuated. Therefore, I compiled a list of well-received young adult and children’s books by Native authors, and books depicting Native people and/or culture, but written by non-Native writers. I then gathered data from school libraries across the state to see which books are readily available to our students, and which are not.

A New Statistic for Measuring Local Spatial Autocorrelation

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Subject Area: Social Sciences

Spatial autocorrelation measures the degree of dependency among geographic regions for a given attribute. For example, is an attribute measured for Oklahoma counties evenly distributed among all the counties or is there some underlying spatial distribution dependent on location? If there is a relationship, is it statewide or limited to local regions? Is this a statistically significant relationship or just due to random variation? These types of questions have been answered in the past using four common measures of local spatial autocorrelation. However, these measures have values that may range from very large negative numbers to very large positive numbers. Such large values overshadow all other values and could lead to interpretation difficulties.

A new measure of local spatial autocorrelation has been developed that is restricted to the range from -1 to +1. This is the range that is typically associated with measures of correlation and corresponds to the range of the Pearson Product-Moment Correlation Coefficient. Thus, it is a measure of spatial autocorrelation that is very easy to interpret.

Statistical properties are being investigated by the use of computer simulated experiments. These properties include size for hypothesis testing, power of detecting a true difference for various scenarios, as well as expected values and variances.
Stream-Aquifer Analysis Tests for Quantifying Alluvial Well Depletion

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Subject Area: Environmental Sciences

Extracting ground water from pumping wells located adjacent to streams can reduce streamflow, a result that is known as alluvial well depletion. At a well site located adjacent to the North Canadian River in central Oklahoma, a stream-aquifer analysis (SAA) test was performed to determine parameters affecting surface groundwater interaction. Observation wells were installed between the stream and the pumping well and were instrumented with automated water level sensors. The discharge well, located approximately 85 m from the river, was pumped at a constant rate (2180 m³/d) for 90 hrs. Predicted drawdown from analytical solutions were fit to the measured drawdown to inversely estimate the transmissivity, specific yield, and streambed conductance, which matched values derived from grain-size analyses and permeameter tests. The similarity in streambed conductance estimates further supported the use of SAA tests to derive reach-scale streambed conductance. Both the SAA test and in-stream conductivity measurements suggested that the stream mimicked a fully penetrating stream with minimal streambed hydraulic resistance. After only one day, estimated stream depletion ranged between 30 and 35 percent of the pumping rate. Simpler analytical solutions were adequate to inversely estimate the aquifer and streambed hydrologic parameters, which considerably simplified the mathematical complexity of the solution.

The Effects of U.S. States' Social Welfare Programs on Poverty

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Scholar Symposium Participant
Subject Area: Social Sciences

Poverty in the United States has long been a pressing problem. In a country as wealthy as the U.S., a national poverty average of 13.2%, with some states reaching 19.3%, seems inexplicable (U.S. Census Bureau, 2008). For those living in poverty, social welfare programs provide access to education, health, housing, and food. In 1996, the U.S. made drastic changes to the welfare system through the Personal Responsibility and Work Opportunity Reconciliation Act. With grants administered by the states, the federal government shifted power and responsibility for social welfare programs onto the states themselves (Committee on National Statistics, 1999). This shift allows and encourages large variations in the types of programs administered in each state, as well as the amount of revenue expended for such projects. This study sought to show that states willing and able to better fund social welfare programs will, as a result, have lower levels of poverty. Per capita spending records of various welfare programs for all 50 states were collected. This data was then analyzed and compared to poverty levels for each state using cross tabulation analysis to show the correlation of each social welfare program to the reduction of poverty.

Why the Community Decided to Rebuild Greensburg, Kansas Green

Dominique Holt, Chuck Koeber, Ph.D.
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Scholar Symposium Participant
Subject Area: Social Sciences

This research investigates the process of organization and decision-making that led to Greensburg, Kansas adopting a Master Plan to rebuild their community "green" after an EF5 tornado destroyed 95 percent of their town on May 4, 2007. Using the Master Plan, an action oriented menu of key project intended to use for making critical funding and resource allocation decisions, the document serves as a guide for the community as it rebuilds. The Master Plan recommends implementation of eco-friendly architecture and community design principles and relies on new eco-friendly technologies and building materials. When
completed, it is intended to transform Greensburg into a model eco-community, indeed, one of the greenest communities in the world. This study is based on a close textual reading of accounts and editorials in regional newspapers, including the Wichita Eagle, Hutchinson News, Kiowa County Signal, as well as relevant national media coverage from 2007 to the present from a variety of journalistic sources. It also relies on Greensburg City Council minutes to document discussions, negotiations, and developments within city government and the community that led to the formation and eventual approval of the Master Plan by the City Council. By providing information about the important factors within the organization and decision-making process that led to Greensburg adopting a rebuilding plan focused on environmental sustainability, the results of the research will provide practical knowledge for disaster recovery experts and policy makers, as well as other communities who seek to strategically rebuild following a disaster. The results may also provide valuable information for communities in general who wish to make their towns more environmentally friendly.

United States Immigration: An International Comparison of Select Policy and Suggested Alternatives

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Scholar Symposium Participant
Subject Area: Social Sciences

The United States immigration is not a perfect system. Rules and regulations, known as policies, are passed when problems arise with the immigration system or its participants. The point of immigration is to promote growth and diversity of a nation. Interestingly enough, immigration came with reward when some nations first began to settle. The United States, being one of these nations, would offer land to those willing to live in its remote and under populated areas. The U.S. is far from this dated promotional technique; instead, there is a greater need to control the immigrant population, but as it grows, problems arise and policy follows behind to amend. Now, more than ever, immigration policy seems to be in constant turmoil as the number of immigrants increase and the large umbrella of policy in the U.S. comes into question. The growth of the immigration population is inevitable. As a government, the U.S. can place limitations and pass new policies in order to stabilize the numbers but this may not be enough. Can U.S. immigration policy be improved? If so, how?

An Urban Anachronism or Cultural Utility? A Geographical Analysis of the Hand-pulled Rickshaws of Kolkata

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Subject Area: Social Sciences

Hand-pulled rickshaws have existed in Kolkata, India since the early 1900s. A century later, the state government wants to ban the rickshaws to ease traffic congestion, because the profession is inhuman, and it affects Kolkata's image. As Kolkata seeks to be considered a progressive city in India, its policies have adopted the developmentalist framework of the West with consequent impacts for Kolkata's urban life. I examine the interaction between Kolkata's citizens and the rickshaw pullers to assess the potential consequences of a rickshaw ban. I use qualitative data-gathering and analysis techniques of open-ended interviews and coding to describe and explain who the pullers are, what services they provide, and who uses the rickshaws and why. I also conduct a discourse analysis to examine the reasoning for the ban. I find that Kolkata's citizenry disagrees with the purported reasoning. I also find that the functions of rickshaws and its pullers go beyond transportation and in fact the pullers contribute to the social and cultural life in Kolkata through their interaction with people and use of Kolkata's urban space. The findings of rickshaws and their pullers challenge the application of development ideas from the global north to cities of the global south.
**Lychnis Breeding**

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Subject Area: Environmental Sciences  

*Lychnis* L., commonly referred to as campion or catchfly is a genus of 24 species in the carnation family *Caryophyllaceae* Juss. Most species are highly ornamental and are quite variable for traits such as flower color, size, and number. The objective of this research is to create novel ornamental cultivars through artificial mutation and inter-specific/generic hybridization. Eight *Lychnis* species and two *Silene* L. species were used in the hybridizations. At least five crosses per combination were tried and flowers were emasculated prior to hybridization. In total, 20 crossing combinations were made, of which 19 were successful in producing progeny seeds. Only eleven combinations were successful in producing hybrid seed from reciprocal crosses (a case where a species is used as a female in one cross and as a male pollen donor in another cross) indicating incompatibility factors may be affecting pollination success. Hybrids will be evaluated according to their phenotypes for ornamental value after plants establishment.

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**Stress and Adaptation among Mothers of Children with Intellectual Disabilities in Urban India**

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

Evidence from developed nations demonstrates that caregivers of children with intellectual disabilities (ID) experience a high level of burden and stress (e.g. Hassall, Rose, & McDonald, 2005). However, few studies have examined the experiences of parents of children with ID in the developing world. Using quantitative and qualitative techniques, the current study looked at stress and adaptation among mothers of 3-6 year children diagnosed with ID (N=48), living in three Indian cities. A t-test comparing the mean maternal stress score from the current study to the mean maternal score from a study by Hassall and colleagues (2005) indicated that mothers in our sample reported significantly higher stress as compared to a similar sample from the United Kingdom. The adaptation ratings indicated that 27% mothers were struggling with their child's disability whereas 37% mothers had adapted well to their child's condition; remaining mothers had a median rating. According to the results of regression analyses, only children's daily living skills was a strong and significant negative predictor of maternal stress and positive predictor of maternal adaptation. A thematic analysis of interview responses suggested that that parenting a child with ID can be burdensome but in many ways, fulfilling as well.
Research evidence of the Co-Occurrence of Binge Eating Disorder and Obsessive-Compulsive Disorder: Clinicians’ Perceptions

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Scholar Symposium Participant
Subject Area: Social Sciences

Objective: To increase the understanding of the association of BED and OCD by receiving the clinicians' perspective and to create treatment options and bring improvement in the education of new professionals.

Methods: A questionnaire was distributed to clinicians in the field of eating disorders concerning the knowledge and beliefs of the co-occurrence of BED and OCD and how their knowledge and beliefs affected their practice.

Result: The majority of respondents either said they were uninformed or simply did not answer the question (67%). Respondents prioritized the OCD cases of co-occurrence. A significant relationship (.011) between knowledge and what is believed about genetics was found.

Discussion: Participants did not support a relationship between OCD and BED and have merely a moderate level of knowledge on the research evidence of an association. There is a need for more research on the association between BED and OCD.

Effects of increasing distillers dried grains with soluble (DDGS) on nutrient excretion during the finishing phase.

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Subject Area: Whiteman Award Presentation

A total of 80 crossbred pigs was used to determine the effects of increasing DDGS on nutrient excretion during the finishing phase (37 to 135kg). Pigs were housed in an environmentally-controlled building with four identical rooms (20 pigs/room), each with a shallow pit, pull-plug system. Pigs were stratified by BW, sex, and ancestry, and randomly assigned to one of four rooms. Diets were randomly allotted in 4 ×4 Latin square design with four rooms and four dietary phases. The four dietary treatments included corn-soybean meal based diets containing 0, 10, 20, or 40% DDGS. Inclusion of 10 or 20% DDGS had little effect on ADG or G:F, but 40% DDGS reduced performance (Quad, P < 0.05). Slurry pH decreased (Linear, P < 0.01) and volume increased (P = 0.02) as DDGS increased. The daily intakes of N (P <0.09), Mg and S (P < 0.01) were increased linearly with increasing DDGS; however, P intake decreased (Linear, P < 0.07). Excretion of DM, N, Mg, and S were increased (Linear, P < 0.01) by 165, 145, 159, and 279% for pigs fed 40% DDGS. In conclusion, increasing DDGS in the diet markedly increases DM, N, and S excretion by finishing pigs.

Which goal structure affects on students' satisfaction in a class?

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Subject Area: Education

The purpose of this study was to investigate how school goal structure, classroom goal structure and student achievement goal orientation (mastery vs. performance) to predict university students' course satisfaction. The participants were 1225 undergraduate students at Oklahoma State University. Analysis of hierarchical regression revealed that school goal structure and classroom goal structure predicted students' satisfaction in a class, whereas students' personal goal orientations did not significantly affect on their satisfaction in a
class. The results of this study support the literature that school goal structure and classroom goal structure directly predict students' course satisfaction.

Quantification of Total $\omega$-6, Total $\omega$-3 and $\omega$-6/$\omega$-3 Ratio in human serum using GC/MS.

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Subject Area: Physical Sciences & Technology

Quantitative determination of polyunsaturated fatty acids (PUFAs) in human serum has been of great challenge to researchers today. The work in this study has quantified six PUFA methyl esters, three which are the ($\omega$-6) esters of linoleic (LAME), conjugated linoleic (CLAME) and arachidonic (AAME) and three others that are the ($\omega$-3) esters of linoleic (LNAME), eicosapentaenoic (EPAME), and docosahexaenoic (DHAME)) fatty acids using GC/MS. Blood serum aliquots taken from the same subjects were analyzed on the same day using GC/MS and visible spectrophotometric detections. Data obtained from GC/MS were quantified according to protocol. Spectral absorbance data from 350-550nm were analyzed using chemometric model, PLS2. Results obtained from the two methods were correlated using student t-test and resulted in good agreements between total ($\omega$-3) and total ($\omega$-6) PUFA levels and for the ($\omega$-6)/($\omega$-3) ratios $\alpha=0.05$, $t_{cal}=-0.59$, $t_{cri}=2.18$, $P=0.57$. The greatest achievement of this study is that, the study was able to apply the separation method described to blood serum for the quantification of total $\omega$-6, total $\omega$-3 and $\omega$-6 to $\omega$-3 ratios using GC/MS for the first time therefore improving the GC separation and detection an aspect that is of great importance to chromatographers and medical line.


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Subject Area: Social Sciences

Mandatory country of origin labeling (MCOOL) for fresh meats, fish, nuts and perishable food products in the United States was implemented by the USDA on March 16th, 2009. US trading partners such as Canada and Mexico have been strong opponents of MCOOL due to its trade restrictive nature while additional opponents to this bill have stated that MCOOL has not presented any value to consumers. These controversies have presented an interest towards attaining an accurate measure of the value of the information provided by MCOOL. Prior MCOOL research has been conducted to determine consumers' value for specific country of origin labeling (Loureiro and Umberger, 2003, Umberger, et al., 2003, Verbeke and Roosen, 2009, Ward, et al., 2005) however, no post-MCOOL research has been presented to determine consumers' value for information provided by MCOOL. Beef and pork consumers in two Texas grocery stores volunteered to participate in a choice experiment and brief survey. Furthermore, the data from these volunteers in this natural non-hypothetical setting will be analyzed to determine consumers' value of information for MCOOL.
SCALING UP OF MANUFACTURING PROCESSES OF RECYCLED CARPET BASED COMPOSITES

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Subject Area: Physical Sciences & Technology

In this work, feasibility of recycling post-consumer carpets using a modified vacuum assisted resisted molding process into large-scale components was successfully demonstrated. The scale up also included the incorporation of nano-clay films in the carpet composites. It is expected that the films will enhance the ability of the composite to withstand environmental degradation and also serve as a fire retardant. Low-cost resins were used to fabricate the recycled carpet-based composites. The scale up in terms of process was achieved by manufacturing composites without a hot press and thereby saving additional equipment cost. Mechanical and physical properties were evaluated. Large-scale samples demonstrated mechanical properties that were different from results from small samples. Acoustic tests indicate good sound absorption of the carpet composite. Cost analysis of the composite material based on the cost of the raw materials and the manufacturing process will be presented.

Selenium Effects on Bone Quality of Mice Following Lactation

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Subject Area: Biological Sciences

Our study examined dietary selenium intake as a factor that might reduce bone loss during lactation or enhance repletion following lactation. The micronutrient selenium may have beneficial effects on the maintenance of bone quality. Changes in tibial bone mineral density (BMD) of mice fed variable amounts of selenium during their three week period of lactation and for an additional month were examined. The otherwise adequate diets had no added selenium, selenium adequate amounts (0.2 mg/kg), or a highly supplemented diet (2.0 mg/kg). After the feeding period, mice were necropsied. Their tibias were scanned using a Piximus instrument for the purpose of measuring differences in BMD between the mice fed the different levels of selenium. Mice fed the adequate selenium diet had significantly higher bone mineral density than those fed the selenium deficient diet but the higher selenium diet did not add any extra benefit. When microcomputed tomography was used to examine trabecular bone in the 4th lumbar vertebra of the spine, there were not significant differences in microarchitecture of trabecular bone due to treatment. Studies on breaking strength of trabecular bone in the spine and microarchitecture of the long bones are continuing. (Supported by the Wentz Foundation and by OCAST).

Amine Selection for Use in Power Plants

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Amines are used as pH control agents in coal-fired and pressurized water nuclear power plants. Ammonia continues to be the primary amine used in power plants, but its effectiveness is limited due to pH excursion as a function of temperature and a high volatility favoring the vapor phase. Alternative amines appear preferable to ammonia as a pH control agent because they demonstrate less pH excursion at high temperatures. The objective of this research is to assess the thermal stability of eight amine candidates: morpholine (MPH), cyclohexylamine (CHA), ethanolamine (ETA), 3-methoxypropylamine (MPA), dimethyamine (DMA), 5-aminopentanol (5AP) and diethylenethanolamine (DEEA), dimethylethanolamine (DMEA). The degradation of eight selected amines to alternative ammonia was examined at the temperature
range of 257 to 577 oC and the pressure range of 648 to 2893 psi as functions of temperature and pressure to minimize corrosion rate. The CHA appears the best amine for all given temperature and pressure range based on Arrhenius constants plots. The degradation rate constants of CHA at 577 oC were found with assuming pseudo first order reaction as 1.1110-3, 1.2110-3, and 1.71 10-3 s-1 and near 1000, 2000, and 3000 psi respectively, and the activation energy was 6.0510-3J/mol at 577 oC.

Ethanol production from carbon monoxide and hydrogen using a new acetogen "Alkalibaculum bacchi" strain CP11

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Subject Area: Biological Sciences

A novel alkaliphilic acetogen “Alkalibaculum bacchi” strain CP11 converted CO and H₂, two main components of syngas, into ethanol and acetic acid. Syngas fermentations were studied in 250-mL bottles containing 100 mL of yeast extract medium at 37°C and pH 8.0. Three types of gas mixtures were used: commercial syngas I (20% CO, 15% CO₂, 5% H₂ and 60% N₂, by volume), commercial syngas II (40% CO, 30% H₂ and 30% CO₂, by volume), and producer gas from gasifying switchgrass (13.4% CO, 16.4% CO₂, 11.1% H₂, 2.8% methane, 0.4% acetone, and 54.5% N₂, by volume). Results showed that strain CP11 produced 0.7 g/L and 1.4 g/L ethanol after 360 h fermentation with commercial syngas I and II, respectively, which is 3.6 and 7.3 times higher than ethanol formed using producer gas. This showed that the presence of more CO in the syngas favored more ethanol formation. Ethanol yields from CO with commercial syngas I and II were 26.4% and 45.3%, respectively, compared to 5.2% with producer gas. These results showed the potential of “Alkalibaculum bacchi” strain CP11 use for biofuel production from syngas.

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Evaluation of a dehydrated beef protein to reduce purge in beef strip loin steaks injected without sodium phosphates

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Subject Area: Whiteman Award Presentation

The objective of this study was to determine the efficacy of a dehydrated beef protein (DBP) in preventing water loss from injected beef strip loin steaks and its effects on shelf life properties when replacing phosphates in an injection brine. Strip loins were injected to 110% of green weight with a brine containing 3.6% salt and 4.5% sodium phosphate (CON) or 3.6% salt and 5% dehydrated beef protein (DBP) instead of phosphate. Steaks were stored in a simulated retail display. Analyses were conducted on days 0, 2, 4 and 6. Lipid oxidation products as determined by the TBARS analysis were higher for DBP steaks across all display times. Color scoring by a trained panel revealed similar color stability throughout display between the two treatments. Instrumental color determination revealed slightly higher lightness values for the DBP steaks and slightly higher redness values for the CON steaks. The DBP treatment steaks lost less purge during display. Steaks receiving the DBP treatment were slightly less tender according to instrumental methods and trained sensory panel. Results indicate the dehydrated beef protein to be an effective agent to increase water holding capacity and a viable alternative to phosphates when used to inject beef strip steaks.
THE RELATION BETWEEN BODY IMAGE, SEXUAL FUNCTIONING, WOMEN'S GENITAL SELF IMAGE, AND FEMINIST IDENTITY

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Subject Area: Social Sciences

The purpose of the study was to investigate the relationship between body image, sexual functioning, genital self image, and feminist identity among a sample of female undergraduate students (N = 288). Exploratory Factor Analysis was used to assess the psychometric properties of the GSI measure. On average the sample reported relatively neutral thoughts about their genitals regardless of ever having a sexual partner or not. As hypothesized, women's overall body image rating and GSI-modified were positively related, r(288) = .238, p < .001. In addition, self-esteem was significantly positively correlated with GSI-modified, r(288) = .177, p < .001. However, sexual satisfaction was not significantly correlated with GSI-modified, r(288) = .00, p = .99. When looking at the women who reported sexual activity in the last 30 days, less than 40% reported that they sometimes or always experienced pleasure through sexual activity with their partner. Further analysis assessing this subsample is necessary to further understand young women's sexual identity and genital self image. This study was a preliminary attempt to explore this relatively complex topic, therefore additional research is necessary to develop a developmental understanding of women's body image, sexual functioning, genital self image, and feminist identity across the lifespan.

Impacts of the 2007 media specialists capacity building project on the Malian participants.

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Subject Area: Social Sciences

In 2007, the Department of Agricultural Education, communications and Leadership at Oklahoma State University conducted a professional development project in Mali for Media specialists. Fourteen Malian media professionals participated in the project. The purpose of this study is to determine the project's impact on the Malian participants three years after the end of the nurturing the fourth estate project. The researcher will investigate in the relevance of such a project in building capacities and leadership skills of these individuals. He will also seek to evaluate progresses made in participants' careers and their everyday professional practices.

Qualitative procedures will be used to collect, analyze, and report data. To collect data an open-ended questionnaire will be addressed to the participants with a consent statement letter. Participants will be guaranteed anonymity and confidentiality. All the project participants will be involved in the study (N=14). Before conducting the survey the researcher will seek for the IRB. The findings will be shared with peers during the research symposium.

CULBERSON COUNTY, TEXAS: THE UNREPORTED COUNTY IN REGARDS TO CANCER OCCURRENCE

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Scholar from Sul Ross State University
Scholar Symposium Participant
Subject Area: Biomedical Sciences

According to the American Cancer Society and the National Cancer Institute's cancer registries, cancer is the second leading cause of death in the state of Texas. However, in many rural communities where cancer treatment facilities are not located, the cancer incidence statistics are suppressed to prevent duplication of
counts from the reporting county where the patient is treated. An overview of the cancer incidence and trends of the top ten cancers for the United States and all sites combined for the rural area of Culberson County, Texas was performed for the years 2000 through 2009. Data for the study was obtained based on reports from the International Classification of Diseases (ICD-9) and medical records from Culberson County Hospital and the Van Horn Rural Health Clinic in Culberson County, Texas. A total of 429 actual new cancers were identified over the ten year period. This is an average of 42.9 official new cases each year for a rural population of only 2431. After adjusting these numbers to make comparable at a "per 100,000" population, the cancer incidence rate for this target area was found to be three times the national and state average.

Sustainability Coordinators in Higher Education, Research and Solutions
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Subject Area: Environmental Sciences

Environmental sustainability is a growing discussion at universities across the United States. Many universities have elected to establish a “Sustainability Coordinator” as a full-time faculty position. This position seeks to maximize cost/benefit projections, provide direction to student groups interested in sustainability, and provide overall focus for the sustainability of the university. The objective of this research is to determine the reasons why some universities have chosen to hire a Sustainability Coordinator while others have not.

Data for this research has been conducted in the form of surveys. These surveys are two-part. Part one is for participants from universities who currently maintain a Sustainability Coordinator at their institution. Part two is for participants from universities who do not have an employed Sustainability Coordinator. This data has been collected from a variety of universities across the United States. Participants include faculty, staff, students, administrators, and the Sustainability Coordinators themselves. Once analyzed, the data collected from these surveys seeks to gain valuable insights on the reasons that some universities choose to employ Sustainability Coordinators while others do not.

P2X7 receptor regulates VCAM-1 dependent neutrophil recruitment during acute lung injury
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Subject Area: Biomedical Sciences

Purinergic P2X7 receptor (P2X7R) is an ATP-gated ion channel and participates in inflammation by regulating IL-1beta processing and release. Recent studies have identified the pathophysiological importance of P2X7R in innate immune function and mechanotransduction. However, the role of P2X7R in acute lung injury is still unclear. Using a two-hit acute lung injury model of low-dose lipopolysaccharide and moderate tidal volume mechanical ventilation we found marked increase in neutrophil sequestration, alveolar–capillary damage and cytokine release in wild-type mice. In contrast, P2X7R inhibition or P2X7R−/− mice showed significant reduction in neutrophil infiltration; less cytokine and soluble VCAM-1 release in bronchoalveolar fluid; and exhibited decrease in alveolar–capillary damage. Moreover, blocking of VCAM-1 through intratracheal route abrogated the inflammatory response which was partially rescued following recombinant VCAM-1 treatment in P2X7R−/− mice. Furthermore, neutrophil chemotaxis is significantly increased towards rVCAM-1 gradient. Finally, we provide evidence that VCAM-1 ectodomain shedding is augmented from IL-1beta treated wild-type alveolar epithelial cells in a dose-dependent manner, but not in P2X7R−/−. Taken together our results suggest that P2X7R facilitates pro-inflammatory response and amplifies the VCAM-1 shedding from alveolar epithelial cells which promotes directional gradient to neutrophil recruitment. P2X7 receptor mediated VCAM-1 shedding from alveolar surface and directional neutrophil
recruitment may provide a new therapeutic target to reduce inappropriate sequestration of neutrophil during acute lung injury.

MECHANICAL AND CHEMICAL CHARACTERIZATION OF POSS INCORPORATED DGEBA RESIN

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Subject Area: Physical Sciences & Technology

This study reports characterization of different properties of diglycidyl ether bisphenol-A resin (DGEBA) incorporated with POSS. Two functionalities of POSS are used namely methacryl and glycidyl, based on their reactivity with epoxy resin. POSS are added to resin at different weight fractions. The mechanical properties of resin are characterized in terms of flexural strength, and fracture toughness as per ASTM standard. It has been found that one functionality of POSS increases fracture toughness by 40% while other functionality shows an improvement in the flexural strength. Different chemical analysis techniques such as differential scanning calorimetry, and Fourier transformation infrared spectroscopy are used to characterize chemical properties of resin system.

Evaluating the Ability of Rapid Geomorphic Assessments to Predict Streambank Retreat Oklahoma Ozark Streams

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Subject Area: Environmental Sciences

Though the streams in the Ozark ecoregion of Oklahoma and Arkansas naturally meander, the rate of lateral streambank erosion has increased due to landuse change. With limited funding available to stabilize these streambanks, methods for prioritizing potential stabilization sites are critical. This research (1) evaluated the performance of two rapid geomorphic assessments (RGAs), Bank Erosion Hazard Index (BEHI) and Channel Stability Index (CSI) on several stream reaches, and (2) developed a new RGA specific to the Ozark ecoregion. Lateral streambank erosion estimated from five years of aerial photography was used to assess the performance of the RGA’s. Failing to account for the cohesive soils on some of the streambank reaches, the RGA’s had low coefficients of determination (R²) of 0.23 and 0.19 for CSI and BEHI, respectively. To account for the cohesiveness of some streambanks, cater several of the metrics to the Ozark streams, and eliminate the difficulty in measuring some of the metrics, a new RGA, the Ozark Stream Erosion Potential Index (OSEPI), was developed. The OSEPI had the highest correlation (R² of 0.31 for all sites; R² of 0.46 for sites with similar soils) to measured streambank erosion and aided in prioritizing sites for future stabilization projects.

Effects of cow weight at weaning on forage intake, milk yield, and calf weaning weight

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Subject Area: Whiteman Award Presentation

Angus sired spring calving cows (n = 36) were used to evaluate the effect of mature size on forage intake during early lactation (29 ± 10 d in milk), milk yield and calf weaning weight. Two blocks of 18 cows each were selected for large and moderate mature size groups based on their BW at weaning the previous year.
adjusted to 5 yr of age and BCS 5. Cows were individually fed and had ad libitum access to prairie hay and a protein supplement. Cows were adapted to pens and diets for 10 d followed by a 5 d collection period. Apparent diet digestibility and milk yield was determined. The mixed procedure of SAS was used with cow size treatment as a fixed effect and block as a random effect. Large cows had greater adjusted BW (535 vs. 468 kg; $P < 0.01$), hip height (134 vs. 130 cm; $P < 0.01$), and BCS (5.52 vs. 5.0; $P < 0.01$) at trial initiation (April 18) compared to moderate cows. However, moderate cows had greater ($P = 0.04$) milk yield than large cows. There was a tendency for large cows to consume more ($P = 0.11$) forage (12.8 kg) than moderate cows (11.8 kg). Forage consumption was not different among the mature size groups when forage intake was expressed as a percent of BW or as a percent of metabolic BW. Apparent DM digestibility tended to be greater ($P = 0.07$) in large (56%) compared to moderate (53%) cows. Large cows had increased ($P = 0.01$) digestible DMI (7.27 kg/d) compared to the moderate cows (6.3 kg/d). However, there were no differences between large and moderate cows when digestible DMI was expressed as a percent of BW or metabolic BW. There were no differences in calf BW at weaning between groups, although there was a tendency for moderate cows to wean a higher ($P = 0.15$) percent of their BW (42%) compared to the large cows (38%). When cow size classifications were determined using kg of BW adjusted to equal age and BCS at weaning, large cows were fatter, produced less milk, consumed similar amounts of forage and were less efficient converting consumed forage to milk production compared to moderate size cows.

### Singaporean luxury branding: A study of branding techniques and luxury measurement

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Subject Area: Environmental Sciences

Because the luxury apparel industry has previously been observed from a Western perspective, there is a lack of understanding regarding the development of non-Western luxury companies, such as those from Asia. The purpose of this study was to examine how Singaporean luxury retailers, in particular, develop their brands through the application of established and tested branding models that measure branding components and luxury perception. By utilizing a qualitative approach, this research explored correlations between how a Singaporean luxury company is branded (what type or how much luxury a brand has), and the specific branding techniques used. Data were collected from twenty luxury store-owners and Singaporean-based industry professionals through a structured in-depth interview and a questionnaire. The results reveal distinct differences between industry professionals and store-owners concerning what they believe should be the most important branding component and luxury perception (i.e., when building a luxury brand. The results also support previous research regarding the changes to the traditional luxury consumer target market. The data suggest the potential need for a new branding model that reflects the distinct cultural and operational challenges that younger Asian luxury companies face.

### Acute Administration of Ketamine Impairs Learning in Trace Cued Conditioning: Validation of an Animal Model of Schizophrenia

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Scholar Symposium Participant  
Subject Area: Biological Sciences

Existing methods of diagnosis and treatment for schizophrenia need improvement, and heuristic animal models of the disease have the potential to provide insight into its underlying mechanisms. The present study focuses on an animal model of schizophrenia based on acute sub-anesthetic administration of the NMDA receptor antagonist ketamine whose action is consistent with the glutamatergic hypothesis of schizophrenia. However, previous reports regarding the way ketamine affects learning and memory have been inconsistent. In the following experiments we investigated the use of an emotional learning and
memory task, as emotional processing has been found to be disrupted in schizophrenia. By using trace cued and contextual fear conditioning, we show that emotional learning and memory is impaired by ketamine at a dose that also disrupts sensory motor gating consistent with other models of the disorder. These data provide a novel way to examine schizophrenia-like symptoms in an animal model. This finding provides additional support for the ketamine model of schizophrenia.

POWER SYSTEM DESIGN FOR A SMART GRID INITIATIVE AT OKLAHOMA STATE UNIVERSITY

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Subject Area: Physical Sciences & Technology

The power grid has been under severe stress due to increased industrialization and commercialization over the past few decades. This has increased congestion problems to a considerable extent on the century-old grid infrastructure. Smart Grid technologies such as intelligent switching, high-speed two-way communications, Automatic Metering Infrastructure (AMI) and integration of Distributed Energy Resources will provide higher redundancy and increase grid efficiency. Focusing on the issues of reliability and availability of power, this paper studies the current distribution system at Oklahoma State University and suggests a modified distribution layout strategy incorporating smart grid technologies which would lead to higher redundancy, cost benefits, energy savings and lesser restoration time during a power failure. It also provides an overview of the challenges associated with the implementation and how it can be overcome in order to transform the current electric grid at Oklahoma State University into a Smart Grid.

Improving Customer Loyalty Program through Text Mining of Customers' Comments

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Subject Area: Physical Sciences & Technology

Typical surveys contain closed-end questions that generate structured numerical data and open-ended questions that generate unstructured textual data. Given the perceived difficulties in analyzing texts, most companies often ignore textual data or simply look at summaries of comments. We illustrate how textual data can be grouped together to generate insights into customers' expectations and how such groupings can be used as input variables to build better predictive models than models based on numerical data alone. Data was collected at a national conference via a survey that had numerical and four open-ended questions. Ten clusters were found in grouping of textual comments. The target is a binary (Yes/No) variable about best loyalty program in the industry. Data was split into training and validation before building predictive models. The best predictive model using numerical data only has a misclassification rate of 26.5% and a sensitivity of 60% in the validation sample. The addition of the cluster memberships as input variables substantially increased the performance of the predictive model (misclassification reduced to 18.7% and sensitivity increased to 82.8%).
Effects of strawberry supplementation on serum glucose and lipids in subjects with abdominal adiposity and dyslipidemia

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Subject Area: Biological Sciences

Strawberries have been shown to exert cardio-protective benefits in several studies. However, clinical investigation is lacking on its effects in subjects with dyslipidemia. We examined the hypothesis that strawberry supplementation will lower glucose and improve dyslipidemia in subjects with abdominal obesity. Subjects (n=23) with abdominal adiposity (abdominal adiposity men>40 inches, women >35 inches) and dyslipidemia (two of four criteria: fasting total cholesterol >200 mg/dL, triglycerides >150 mg/dL, LDL-cholesterol >100 mg/dL, or HDL-cholesterol (men<40 mg/dL, women <50 mg/dL) were randomly assigned to strawberry (50g/day freeze-dried strawberries) or control (8 g fiber/day) daily for 12 weeks. Blood draws, anthropometrics, blood pressure, and dietary data were collected at screen, 6 and 12 weeks of the study. Strawberry intervention revealed a significant decrease in total and LDL-cholesterol at 12 weeks versus fiber and calorie-matched control group (p<0.05). No effects were noted in fasting glucose, insulin resistance, blood pressure, and body weight. Strawberry intake may exert lipid lowering effects in subjects at risk for cardiovascular disease.

Funded by California Strawberry Commission, CA, USA

Development of an Improved Adenovirus Gene Therapy Vector that Employs Cell Penetrating Peptides for Transformation of Difficult to Infect Cell Lines

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Subject Area: Biomedical Sciences

Gene therapy is the treatment or prevention of disease through introduction of nucleic acids into somatic cells of a patient using a gene delivery vector. Adenovirus is a promising gene therapy vector and is currently used in more than 25 % of the clinical gene therapy trials. The viral vector, however, has serious drawbacks such as immunogenicity, promiscuous tropism, and the inability to efficiently infect certain types of cells. We have developed an improved vector that is composed of adenovirus and a synthetic conjugate composed of polyethylene glycol (PEG) and cell penetrating peptides (CPP). PEG has been shown to reduce the susceptibility of the virus to immune inactivation and eliminate the promiscuous tropism of the virus. The CPP, in this case, enables the virus to transform cells that lack the native coxsackie-adenovirus receptor (CAR) thereby delivering genes to cells that are otherwise difficult to infect.

The nanoparticle complexes, composed of adenovirus, PEG, and CPPs, were synthesized using heterobifunctional PEG with a thiol-reactive maleimide (MAL) group and an amine-reactive N-hydroxyl succinimidyl ester (NHS) group. The MAL-PEG-NHS was used to PEGylate adenovirus and link PEGylated adenovirus to CPPs (e.g. TAT, Penetratin, polyarginine, Pep-1). The transduction efficiency of the resulting nanoparticles was studied on cells with and without the native adenovirus receptor (CAR+ and CAR-). The transduction efficiencies of the particles were optimized by varying the type of CPP, degree of PEGylation, PEG molecular weight, and ratio of CPPs to adenovirus. Nanoparticle size, zeta-potential and polydispersity were characterized using dynamic light scattering, and particle morphology was studied using electron microscopy. The complexes show similar transduction efficiency on CAR+ cells and up to 80 fold improvement on CAR- cells compared to adenovirus alone.
Producers and Consumer attitudes toward Biotechnology in Ghana

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Subject Area: Social Sciences

Agricultural biotechnology has the potential to improve Africa's food productivity and security, but it will not be successful without investing in education. African farmers often have difficulty accepting new products unless they fully understand the product's potential. This reluctance is because of the large investment that farmers have in their farms. Farms serve as a store of wealth, which creates financial independence. Farms provide the basic necessities and tuition to send their children to school. Without a guarantee for success, farmers are reluctant to try a new product or technology. Through education and demonstration, African farmers may overcome this aversion to innovations. An educational gap exists between producers- and consumers in agricultural biotechnology. This problem exists because of a lack of investment in education and outreach.

Eliminating Response Style Segments in Survey Data via Double Standardization before Clustering

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Subject Area: Social Sciences

Segmentation is the process of dividing a market into groups so that members within the groups are very similar with respect to their needs, preferences, and behaviors but members between groups are very dissimilar. Marketers often use clustering to find segments of respondents in data collected via surveys. However, such data often exhibits response styles of respondents. For example, if some respondents use only the extreme ends of scales for answering questions in a survey, the clustering method will identify that group as a unique segment which cannot be used for segmentation. In this paper, we first discuss the different data transformation methods that are commonly used before clustering. We then apply these different transformations to survey data collected from 959 customers of a business-to-business company using SAS®. Both hierarchical and k-means clustering are then applied to the transformed data. Our results show that double-standardization performs better than other transformations in eliminating groups that identify response styles.

Characterizing gene delivery efficiency of an adenovirus coated with PLL-g-PEG copolymer

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Subject Area: Biomedical Sciences

Immunogenicity and promiscuous tropism are two factors that limit the use of adenovirus as a gene therapy vector. Susceptibility of the virus to immune inactivation has been addressed to some extent by coating the virus with polyethylene glycol (PEG). While PEG provides some protection against inactivation, the polymer also severely affects the efficiency of the virus. Poly-L-lysine (PLL) used with PEG may alleviate the negative effects. In this study PLL grafted PEG copolymer (PLL-g-PEG) was synthesized using PEG with a succinimidyl carboxymethyl (SCM) terminal end. The PLL-g-PEG copolymer was synthesized using various molecular weights of PEG and PLL as well as varying the grafting ratio of PEG to PLL.

The synthesized copolymers were verified using HNMR spectroscopy and used with purified adenovirus to form PLL-g-PEG-Ad complexes. The infectivity of the resulting complexes was evaluated using NIH-3T3 cells that are deficient in the coxsackie-adenovirus receptor (CAR). The infectivity results indicate that the
PLL-g-PEG copolymer is able to mediate internalization of the virus, and ultimately infection, in a CAR-independent manner. The infectivity of the polymer-virus complex was optimized, cytotoxicity was measured, and the physicochemical characteristics (i.e., hydrodynamic diameter, zeta-potential, and morphology) were determined using dynamic light scattering and transmission electron microscopy.

**Differential protein expression of drought stressed tall fescue**

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Subject Area: Environmental Sciences

Plants may survive drought stress by altering photosynthetic metabolism. This study is designed to further discover the change of proteins in tall fescue (Festuca arundinacea Schreb.) under different periods of drought stress. The objective of the research is to investigate the response of dehydrin proteins to drought stress in whole tall fescue plants and in detached leaves during different periods following drought stress. Three tall fescue cultivars ('Kentucky 31', '2nd Millennium' and 'Rebel Exeda') were subjected to several days of drought stress until complete wilting of leaves was observed in some plants. Additionally, detached leaves of each cultivar were exposed to dehydration for different periods in a growth chamber. Turf quality (TQ), leaf relative water content (RWC) and electrolyte leakage (EL) were measured for the whole-plant drought stress experiment, while relative water loss rate (RWL) was measured for the detached leaves experiment. After finishing SDS-PAGE (sodium dodecyl sulfate polyacrylamide gel electrophoresis) and western blotting, the results indicated a change of dehydrin proteins expression among cultivars after prolonged drought exposure. This study is important to discover the relationship between dehydrin and drought and investigate the differences between drought tolerant and drought sensitive cultivars in both detached leaf and whole plant experiments.

**Burning down the house: The links between work stress, depression, social support and infidelity among firefighters**

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Subject Area: Social Sciences

Using a sample of ever-married firefighters (N=642), we compared the links between work stress, depression, social support, and firefighters' self-reports of infidelity in their marriages. Higher rates of depression, more work stress, and lower social support were associated with an increased likelihood of infidelity. Firefighters who reported that they felt like their lives were endangered on the job all the time were also more likely to report infidelity had occurred. Several factors such as religiosity and partners' work schedule being compatible with their own were associated with lower reports of infidelity. Our results highlight the importance of including occupational stressors when examining infidelity especially in an occupation such as firefighting, which has unique multiple stressors (long work hours, rotating shifts, and traumatic experiences).


**Characterization of switchgrass using TGA-FTIR under nitrogen and air atmospheres**

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**Subject Area:** Physical Sciences & Technology

Using dedicated crops such as switchgrass is foreseen as an efficient way of generating biofuels. Though there are different ways of converting this biomass into biofuel, thermochemical conversion has always been an attractive process. One reason being its ability to breakdown a complex structure such as lignin. To optimize the thermochemical conversion process, it is essential to understand the thermal behavior of biomass materials. There is a need to understand the reaction kinetics occurring during biomass decomposition for the process design and optimization. The objectives of the present study are to determine the thermochemical characteristics of switchgrass and analyze evolving gases online using Thermogravimetric analyzer (TGA) coupled with Fourier transform infrared spectrometer (FTIR). The decomposition of switchgrass was found to occur in three stages. The significant weight loss occurred in the temperature range of 220°C to 400-420°C in nitrogen atmosphere and 220 to 350-390°C in air atmosphere depending on heating rate. Thermogravimetric analyses were carried at different heating rates ranging from 10°C to 50°C. The weight loss kinetics for switchgrass, cellulose, hemicellulose and lignin were evaluated under inert and non inert conditions. The gases such as CO2, CO, CH4 were identified as major end products during switchgrass decomposition.

**Individual Differences in the Centrality of Website Aesthetics, Online Trust, and Intention**

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School of Management Science and Information Systems  
**Subject Area:** Social Sciences

In this article, we propose a conceptual framework for understanding how website design, especially website aesthetics, influences customers' trust in an e-commerce setting. We also clarify importance of individual differences in the centrality of website aesthetics (CWA) that may underlie a number of other customer perceptions of a website such as perceived design aesthetics, perceived usability, and intention to buy from the website. CWA is adopted from marketing literature and is defined as the level of significance that website visual aesthetics hold for a particular customer in his/her relationship with websites. A 2x2 factorial design experiment (2 levels website aesthetics vs. 2 levels of usability) was conducted to test the model in an online apartment rental company. The results suggest that CWA was found to impact the level of customers' trusting beliefs about the company. This, in turn, positively influenced customers' intention to make apartment reservations with the rental company.

**The Effect of Animal Feeding Operations (Cattle and Swine Operations) on Counties' Employment and Income in Oklahoma State**

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**Subject Area:** Social Sciences

The economy of the Western one-half of Oklahoma heavily depends on crop and livestock production, e.g., wheat, corn, cattle, and swine. However, their output is dependent on input supplies, local climatic conditions, and soil type in each county. Previous researchers have estimated only regional single period IO models for impact analysis, which does not capture annual...
changes at the county level. The objectives of this study are: (1) to estimate the impact of crop and livestock production, with special emphasis on animal feeding operation on the demands for purchased inputs for counties in the Western one-half of Oklahoma, and (2) to quantify the impacts of livestock feeding operations, beef and swine, on the local economies. The data from year 1970-2008 are collected from the Bureau of Economic Analysis (BEA), National Agricultural Statistic (NASS), Census of Agriculture, and GIS analysis of satellite images. The method is to estimate county level time series –cross section cost equations using the county as a multiproduct unit. Seven input demand equations for each county were estimated using PROC MODEL procedure in SAS. Preliminary results show that elasticities for specific crop and livestock types can be obtained. Overall results also indicate that there is considerable variability between counties.

Acetogenic Fermentation of Synthesis Gas: A Simple Thermodynamic System
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Department of Biosystems and Agricultural Engineering
Subject Area: Biological Sciences

Acetogenic fermentation of synthesis gas follows a simple system of elementary reactions that comprise the Wood-Ljungdahl pathway. The pathway reactions occur in sequence (series and parallel series) and are associated with and mediated by the cell membrane. These elementary reactions are primarily electrochemical oxidation/reduction reactions that reflect the electrochemical potential within the cell. The electrochemical potential inside the cell is set by (or sets) the equilibrium position of the half cell reactions involved. Oxidation/reduction half cells involved include NAD⁺:NADH, ferredoxin Fdox:Fdred, CO₂:CO and H⁺:H₂. Electrons derived from the reduced substrates, CO and H₂, supply all energy for growth and production. Product formation yields no ATP from substrate level phosphorylation, and growth is driven by a membrane potential via an ATP synthase. The free energy of each progressing elementary reaction is negative, and the thermodynamics of the active fermentation depart significantly from the free energy and electrochemical potential at standard conditions, ΔG°' and ΔEm°'. The thermodynamics can be estimated by analysis of substrate mass transfer and the electrochemical potential defined by the concentration of dissolved H₂ within the cell. The 20 reactions that define the production pathway are incorporated in a tractable mathematical model of fermentation.

Effects of fire on snags and woody debris in the Cross Timbers
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Subject Area: Environmental Sciences

The Cross Timbers are the main type of forest in Oklahoma and fire is central to the forest's existence. Dead trees and broken pieces from trees, known as snags and woody debris, respectively, have multiple roles in this forest type, including habitat and fuel for fire. To date, little information exists on snag and woody debris components in the Cross Timbers. We sampled Cross Timbers stands in three Oklahoma wildlife management areas that are managed with varied prescribed fire programs so that we could describe the relationship between fire and snag and woody debris input and output.
QTL mapping of genomic regions harboring greenbug biotype I resistance alleles in sorghum.

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Subject Area: Biological Sciences

Greenbug is a severe pest on sorghum especially in the great plains of U.S. Among the four biotypes, biotype I causes a huge loss in sorghum yields. Sorghum breeding programs deploy various resistant sources to combat the losses caused by different biotypes. We conducted two QTL mapping experiments to determine the genomic regions conferring resistance to greenbug biotype I using PI607900 as the resistance source. Our first QTL experiment was conducted using an F2 mapping population developed from a cross between BTx623 and PI607900. Second QTL experiment was conducted using an intercross population derived from first experimental population. Phenotyping was carried at four different time points in the greenhouse employing randomized complete block design in two sets, each consisting of three replications. The two parental lines differed significantly for greenbug feeding response at all time points. The genotyping experiment had 107 polymorphic SSRs markers screened in both populations. MAPMAKER 3.0 was adopted to construct linkage map and QTLs were detected employing QTL cartographer. The results from the two experiments revealed a major QTL located on sorghum chromosome nine (SBI09). The region harboring major QTL was linked with several genic markers which can be used for marker-assisted selection and map-based cloning.

"Susceptible Minds": Suicidal, Murderous, and Banished Women in Todd Downing's The Cat Screams

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Subject Area: Humanities

In 1925, Todd Downing published a short essay entitled, "A Choctaw's Autobiography." Though he expressed pride about his cultural heritage, Downing was quick to assert that American Indians should band together to hold the "United States government; a government dedicated to liberty and the proposition that all men are created equal to the promises made to their fathers." Downing is almost prescient in his ability to imagine the possibilities for Natives who align across tribal and even national boundaries. Yet while Downing envisages transnational affiliations for Natives working toward fair political rights, he privileges finding ways to think about race relations over other types of oppressions, such as sexism, that also plague indigenous groups. Downing's novel, The Cat Screams, although remarkably farsighted in its turn toward global indigenous rhetoric, ultimately fails in its mission because it maintains strict patriarchal bounds, paradoxically espousing oppression while at the same time attempting to dismantle it.

Maintenance energy requirements of gestating beef cows and plasma concentrations of thyroxine and triiodothyronine.

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Subject Area: Whiteman Award Presentation

Cows (n=40, Rep1 n=32, Rep2) were used to determine the effects of maintenance energy requirement (MR) on plasma concentrations of thyroxine (T4) and triiodothyronine (T3). Cows were fed a ration for 10 wk (Rep1) and 17 wk (Rep2) during gestation. After 2 wk on a ration that supplied MR (Model 1, NRC 1996) cows were weighed twice weekly. Body weight was maintained for 21 d for 27 cows (Rep1) and 31 d for 25 cows (Rep2). Blood samples were collected on 2 d in January, and 2 d in May. Cows were classified
based on MR as low (≥0.5 SD less than mean, LMR), mod (±0.5 SD of the mean, MMR) and high (≥0.5 SD greater than mean, HMR). MR did not influence concentrations of T3 or T4 (P ≥ 0.58) (Rep1) when temperatures were similar on the two sampling days. In January (Rep2) when sampling temperatures were cooler, LMR had greater T4 compared with MMR (P = 0.03) and HMR (P = 0.001), and when sampling temperatures were warmer, HMR had greater T3 compared with MMR (P = 0.07) and LMR (P = 0.007). Identification of cows with lower MR could improve profitability of beef production.

**Cellulosic ethanol production from softwoods: Effect of sulfite pretreatment**

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Oklahoma State University
Department of Biosystems and Agricultural Engineering

Subject Area: Biological Sciences

The increased infestation rate of the *Juniperus virginiana* (commonly known as Eastern red cedar) across the grasslands of Central Plains has resulted in the loss of pasture land for grazing animals, increased water uptake and more allergy problems due to pollination. The composition of the Eastern red cedar was observed to be 40.3% glucan, 8.5% xylan, 2.0% galactan, 1.4% arabinan, 6% mannan and 35.9% lignin with extractives and ash content to be 6.3% and 0.3% respectively. The polysaccharides in Eastern Red Cedar could be converted into ethanol using enzymatic hydrolysis and fermentation. For ethanol production to be feasible, an efficient pretreatment step is necessary. Sulfite pretreatment to overcome recalcitrance of lignocellulosics (SPORL) was tested by varying the concentration of two factors: sulfuric acid concentration (0%, 2.5%, 5% w/w dry wood) and sodium bisulfite concentration (0%, 5%, 10% w/w dry wood). The pretreatment temperature, time and ratio of pretreatment liquor to wood were 180°C, 30 min and 5:1 respectively. Compositional analysis of the pretreated solids and prehydrolysate were carried out after the pretreatment step to determine the formation of fermentation inhibitors, hemicelluloses and lignin removal. Finally, digestibility of the pretreated solids was assessed using 15 FPU cellulase/g of glucan loaded.

**Optimism, Hope, Hopelessness, and the Path to Suicidal Thinking**

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Subject Area: Social Sciences

Researchers have long sought to understand the path that leads to suicide. Beck (1963) initially identified hopelessness as a significant risk factor for suicide, and hopelessness has become one of the best-supported constructs as a risk factor for suicide. Research has also shown that a lack of belonging and the perception of being a burden to be significant risk factors for suicide, and a recently proposed theory by Joiner (2005) incorporates these interpersonal components into a model of suicidal risk. In addition to examining risk factors, it has been suggested that examining protective factors against suicide, such as hope and optimism, would serve to broaden our understanding of suicide (Grewal and Porter, 2007; Wingate et al., 2006). The purpose of the current study is to attempt to form a more cohesive picture of the path to suicidal thinking by using structural equation modeling to test an overall model of how optimism, hope, and hopelessness are associated with the interpersonal risk factors of perceived burdensomeness and thwarted belongingness. Overall, it was hypothesized that hopelessness, hope, and optimism would predict suicidal ideation indirectly, through their association with the interpersonal risk factors of perceived burdensomeness and thwarted belongingness.
VISCOELASTIC PROPERTIES OF CHITOSAN

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Subject Area: Biomedical Sciences

With the availability of different natural and synthetic materials that can be introduced to human body, regenerating defective tissues outside the body has attracted significant interest. Three dimensional scaffolds can be prepared from both synthetic and natural materials that are i) compatible with the human body, ii) bio-degradable and iii) supportive of reparative cell colonization. Scaffolds support biological processes like adhering, migrating, growing and differentiating of cells, on the matrix. There are different methods of preparation of scaffolds like freeze drying, phase separation and electrospinning, based on the type of application. Apart from being bio-compatible, tissue engineering scaffolds should have highly porous structures in order to aid such biological activities and be mechanically strong to withstand the disturbances in the body. Since many tissues in the body exhibit viscous (like fluids) and elastic (like solids) behavior, prepared materials should have similar characteristics. In this study, I discuss the viscoelastic characteristics of scaffolds prepared from materials widely investigated in tissue engineering. Implications of these findings will be discussed in the presentation.

Blueberry supplementation and dietary flavonoid intakes on antioxidant status and inflammation

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Subject Area: Biological Sciences

Blueberries are a good source of polyphenolic flavonoids and are known to be antioxidants and anti-inflammatory agents. We tested the hypothesis that blueberry supplementation will decrease biomarkers of inflammation and increase antioxidant status in subjects with Metabolic Syndrome versus controls. Nineteen subjects identified with metabolic syndrome were assigned to consume a 50 gram dose of freeze-dried whole blueberry drink daily for 8 weeks while 12 subjects were assigned as controls and consumed equivalent fluid amounts daily for 8 weeks. Subjects in both groups kept a 3-day food record dietary flavonoid intake for analysis. Blood draws and anthropometrics were performed at baseline and at 8 weeks. Blueberry supplementation did not significantly alter CRP, IL-6, and adiponectin. At week 8, Quercetin and EGCG were significantly higher in the blueberry group compared to the control (Blueberry: 22198.48 mg, Control: 5768.14 mg p=0.047; Blueberry: 284.99 mg, Control: 9.33 mg, p=0.035, respectively). Thus, blueberry supplementation did not alter markers of inflammation, and the antioxidant effects may be attributed to the decrease in serum carotenoids, specifically lycopene in the blueberry group compared to the control at week 8 (6.87 4.66 g/mL to 4.83 2.70 g/mL).

Funded by US Highbush Blueberry Council

Nest Defense in the Eastern Bluebird

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Subject Area: Biological Sciences

The Eastern Bluebird (Sialia sialis) falls prey to various predators including black rat snakes (Elaphe obsoleta). While a few researchers have observed antipredatory responses of the Eastern Bluebird to rat snakes near their nests (which included diving and hovering above the snake's head) no study has yet quantitatively analyzed these responses. Also, due to the rarity of observing predator-prey encounters in
nature it has been necessary to simulate such encounters for research purposes. I hypothesized that Eastern Bluebirds actively defend their nests to black rat snakes. I conducted 24 predatory trials using a sinuous black snake model pulled with the use of a fishing pole and line. In 14 of the 24 trials the bluebird parents exhibited mobbing behavior towards the snake including dives and extended hovering. Frequently, other species of birds assisted the parents in mobbing behavior. Within pairs, male and female defensive behaviors were highly correlated. Defensive were also examined to ascertain whether correlations exist between the parents’ defensive behaviors and data collected in separate study. For instance, the parents' defensive scores in response to the snake did not correlate with their defensive scores in response to a nest competitor.

Spring Baseline Floral Inventory of Hancock Hill, Brewster County, Texas
Joshua Rousselow, James C. Zech
Scholar from Sul Ross State University
Scholar Symposium Participant
Subject Area: Biological Sciences
Research was conducted from March-May of 2010 in Brewster County, Texas to catalogue plant specimens in bloom, fruit, or easily identifiable along a 1 mile (1.6 km) belt transect near Sul Ross State University. The study yielded a collection of 18 families and 32 taxa. Asteraceae, Acanthaceae, Cactaceae, and Pteridaceae were the most prevalent families with 3 or more taxa collected. All of the plants collected were identified and prepared for the Herbarium at Sul Ross State University. The study closely resembles previous findings, however showing minor differences in families most likely due to length of the study and time of year.

Impacts of dietary stoichiometry on the performance and physiology of Daphnia genotypes
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Subject Area: Biological Sciences
Frequency and distribution of genotypes (clones) in the natural population of Daphnia pulex is maintained due to environmental heterogeneity where some genotypes are favored over others due to some form of trade-offs in their competitive abilities. Previous work on two clones of D. pulex (LL4-15 & LL4 -17) which differs in IGS length, Pgi and other gene loci found that both differed in their performance under high phosphorus (P) and low P conditions. Whether such pronounced fitness-relevant differences between genotypes are the result of variation in Carbon (energy) & P (nutrient) processing between these clones remains to be seen. Here, we use dual radiotracer (14C & 33P) measurements to test predictions about the balance of C & P in two distinct laboratory clones of D. pulex. The clones are compared for differences in their ingestion rate (IR), absorption efficiency (AE) and egestion rate (ER) when fed with radiolabelled algae, Scenedesmus acutus grown under different C: P conditions. Based on previous study we predict that LL4-17 performs better under high C: P conditions because it has higher rates of P-acquisition, assimilation and/or higher rates of C-efflux. Consistent with our predictions we found a significant higher IR & AE for P and a higher ER for C in LL4-17 under high C: P conditions. Our study demonstrates that variations in key physiological processes underlie success in high P and low P environments. Further studies involving generation of transcriptonomic data on these clones may be useful to better understand the impact of environment (e.g. cultural eutrophication) on the maintenance and divergence of genotypes in natural populations.
Improved O'Connell correlation for distillation column efficiency prediction

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Subject Area: Physical Sciences & Technology

The objective of this work is to improve predictions of overall distillation column efficiency by modifying the O'Connell correlation. Efficiency plays an important role in the design of distillation columns. Distillation efficiency models have been presented in the literature for more than 60 years. However, the O'Connell correlation (1946), which is based on physical properties, is recommended by most literature sources even today (Kister, 1992). O'Connell's original correlation was developed using bubble-cap and sieve tray data. In this work, we modify the correlation to include valve tray data collected at Fractionation Research, Inc. which has been made public. Results are presented along with a discussion of other factors that potentially explain variations in the data used to generate the modified correlation.

Impact Assessment on Sustainability of a Methyl Chloride Production Process

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Subject Area: Environmental Sciences

Increasing concerns over global climate change in recent decades due to greater amounts of greenhouse gases in the atmosphere or ozone depletion etc. are leading engineers to address 'environmental' impacts of industrial processes. As 'economics' of the industrial processes were dictated as the main constraint in the design of chemical process plants, health and safety of the workers and public welfare ('social' concerns) have only recently become another main constraint. Addressing environmental, social, and economic concerns falls under the evaluation of sustainability of industrial processes. With all these concerns, engineers are developing novel methods for chemical process design.

One method developed by the sustainability group at the Oklahoma State University is a Microsoft Excel based tool titled “SUSTAINABILITY EVALUATOR”. The tool evaluates and provides certain metrics under environmental, social, and economic impacts.

One case study involves a process for the production of methyl chloride which is in the course of sustainability evaluation. This process was chosen because of its environmental impact, regulatory restrictions, and potential for improvement. The focus of the discussion will include results from this case study with the complete evaluation of sustainability of the base case and the improved optimized process using the “SUSTAINABILITY EVALUATOR”.

(±)-1-Alkyl-2-aryl-6-nitro-4-oxo-1,2,3,4-tetrahydroquinoline-3-carboxylate Esters by a Tandem Imine Addition-SNAr Reaction

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Subject Area: Physical Sciences & Technology

The development of a tandem imine addition-SNAr annulation reaction has afforded a new approach to 1,2,3,4-tetrahydroquinolinone-3-carboxylate esters. A series of 1-alkyl-2-aryl-6-nitro-4-oxo-1,2,3,4-tetrahydroquinolinone-3-carboxylate esters have been generated by reacting an imine with a β-ketoester substituted at C3 by a 2-fluoro-5-nitrophenyl group. Variation in the final product is possible through changes in the structure of the imine and potentially by altering the electron-withdrawing group on the aromatic acceptor. The imines are formed by reacting a 1:1.2 ratio of a primary amine with an aldehyde derivative in N,N-dimethylformamide for 6 hours. The β-ketoester is then added to initiate a spontaneous
tandem reaction to produce the substituted 1,2,3,4-tetrahydroquinolinone-3-carboxylate esters in 73-89% yields. The reaction occurs without the need for added base or heat. Future work will include determining conditions that can support the use of other imines to broaden the scope of the process.

**Fibroblast growth factor 9 influences steroidogenesis and gene expression in ovarian granulosa cells of cattle**

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Subject Area: Whiteman Award Presentation

Ovarian cysts cost the dairy industry millions of dollars annually because of the resultant increased number of days open, reduced milk production, and increased culling rate. A recent study discovered that fibroblast growth factor 9 (FGF9) is down-regulated in cystic follicles versus non-cystic follicles in cattle. Therefore, experiments were conducted to evaluate the effect of FGF9 on steroidogenesis and gene expression in bovine ovarian granulosa cells from small (1-5 mm) follicles (SMGC). Quantitative RT-PCR was used to measure gene expression of side-chain cleavage enzyme (CYP11A1), aromatase (CYP11A1), and follicle-stimulating hormone receptor (FSHR). SMGC were grown in vitro and treated with FGF9, FSH, insulin-like growth factor 1 (IGF1), forskolin (an inducer of adenylate cyclase), and dibutyryl cyclic adenosine monophosphate (dbcAMP). FGF9 decreased CYP11A1 and FSHR mRNA expression (p<0.05) and tended to decrease CYP19A1 mRNA expression. FGF9 alone increased progesterone production, and in the presence of IGF1, FGF9 decreased estradiol production (p<0.05). FGF9 in the presence of IGF1 also inhibited (p<0.05) forskolin- and dbcAMP-induced estradiol and progesterone production. We hypothesize that as intrafollicular FGF9 production decreases, the inhibitory effect of FGF9 is attenuated and ovarian follicles are able to produce more steroids which may lead to the development of cystic follicles.

**Development and Testing of a Scale to Measure Kindness Toward Others**

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School of Educational Studies  
Subject Area: Social Sciences

This paper describes the development and testing of a scale designed to measure kindness toward others. Few, if any, psychometrically validated scales seem to be available that tap this construct. Several scales measure compassion toward others and self, but these are limited to thoughts and attitudes rather than actual behaviors. Kindness toward others is defined as daily, routine, seemingly insignificant acts, such as opening a door for someone or being friendly toward strangers. These micro-level interactions may impact interactants' emotional well-being and, possibly, the general culture regarding treatment of others in the macro-level social environment. This research is based on the theory that ritualized symbolic practices (RSPs) create social structure. RSPs are seemingly habitual behaviors that may serve to shape our beliefs and actions when they become imbued with meaning, whether consciously or not. Initial examination of reliability using data from a pilot test of 288 participants showed high internal consistency for the scale and a unidimensional factor structure. More research is needed regarding concurrent, discriminant and construct validity. The proposed scale may be used in settings such as anger management classes, clinical psychology, or in any other setting where an understanding of how one treats others is important.
Effect of drying temperature, partial lipid extraction, and storage conditions on the shelf life of cilantro

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Subject Area: Physical Sciences & Technology

Cilantro (Coriandrum sativum) is widely used in the food and pharmaceutical industries. It has small fresh shelf life. Dehydration of cilantro leads to quality defects such as structure and texture loss, color degradation, loss of aroma and flavor and development of off-flavors. This study evaluated partial lipid extraction with propane to improve the shelf life of dehydrated cilantro. Cilantro was dried at two drying temperatures viz. 40°C, 60°C and particle size reduced to produce large flakes, small flakes and coarse powder. Each treatment was extracted with propane for different extraction times (10 min, 20 min and 40 min) and stored for twelve months at four storage conditions (-26°C, 4°C, room temperature, and 40°C). The samples after each month were taken out of storage and tested for moisture content, hue, chroma, browning index, volatile composition, and methyl esters of fatty acids. Results showed a significant effect of drying temperature, particle size and storage temperature on all the response variables.

Effects of bale feeder type and processing on hay waste, intake, and performance of beef cattle

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Subject Area: Whiteman Award Presentation

Sixty-four gestating beef cows in a 4×4 latin square design with hay processing methods, long stemmed [L] and pre-cut [PC], and feeder types, ring feeder [RING] and, cone feeder [CONE]. Following a 10 d adaptation hay waste was collected over 4 d every 24 h, resulting in 8 replicates per processing and feeder combination. There was less hay waste from L than PC (8.31 vs. 12.97% respectively, P<0.05). CONE feeders had 7.74% less waste than RING feeders (P<0.05). Neither hay processing nor feeder type effected DMI (P>0.05). Ninety-six calves blocked by gender were randomly allotted to evaluate hay processing on 45 d post-weaning performance. Hay provided in RING feeders was replenished when 15% remained, to prevent limiting DMI. Calf ADG was not changed by hay processing (P=0.55). Forty-eight cow/calf pairs were randomly allotted to paddock (n=4) to evaluate the effect of hay processing on hay waste and intake using Bextra modified cone feeders. Following a 10 d adaptation hay waste was collected over 4 d every 24 h. Long stemmed had 7.88% less waste than PC (P=0.03). Processing had no effect on DMI (P=0.66). Hay processing increased waste and did not effect DMI or post-weaning performance.

Material characterization of carbon fiber surface by AFM Dual frequencies tapping mode

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Subject Area: Physical Sciences & Technology

Advancement of nano composites requires new techniques of imaging and mechanical property characterization at small scales. Implementing an atomistic scale sharp tip interaction with material surface, Atomic Force Microscopy based techniques are potentially unique nondestructive localized method for nano scale study of mechanical properties. Contact and tapping mode are two known methods been utilized for surface roughness and phase change. In dual frequency tapping mode imaging, like tapping imaging, amplitude of first resonant frequency of the cantilever is used as feedback loop and higher harmonics is used
for phase imaging in order to get more information to characterized material properties. In this paper, Dual frequency taping mode was implemented to study the surface of carbon fiber. Surface of carbon fibers were oxidized in order to give fibers a better bonding properties. Detachment of oxidized layer from the high curvature area of surface, which is similar to the detachment of coating from surface of a beam during bending were determined using this technique. This knowledge helps better understanding and optimizing the fiber surface treatments process.

Fluidization-hydrodynamics of a mixture of gasifier residues, chopped switchgrass and bed material

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Subject Area: Biological Sciences

Biomass gasification is one of the available technologies that can supplement the world's energy need. A fluidized bed gasifier can efficiently convert loose, low density, irregular shaped and low energy grade biomass into a gaseous fuel. For achieving efficient performance of the gasifier, proper fluidization of materials present in the fluidized bed is being very essential. Improper fluidization of bed materials could result in low heat and mass transfers, ineffective gas-solid phase reactions and an inability for the gasifier to maintain uniform temperature in the reactor bed. Such conditions can cause an accumulation of gasifier residues (char and ash) and un-reacted biomass inside the bed resulting in chocking of the bed and ultimately failure of the gasification process. This work is aimed to study the fluidization hydrodynamics of materials normally present in the gasifier bed during operation. A mixture of gasifier residues, chopped switchgrass and bed materials in different quantities will be studied using 10-inch ID transparent fluidized column. Results will show optimal operating conditions in terms of fluidization velocity and pressure to achieve efficient mixing in the bed.

Scenario optimization approach for supply chain and logistics management of switchgrass to biorefinery

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Subject Area: Biological Sciences

Increasing demand and dependence of US on foreign oil has focused attention of researchers on exploring alternative energy sources. Biofuel is recognized as the future renewable energy source. The supply chain of biomass is a combination of several distinct processes such as harvesting, baling, pre-processing, storage, transportation, and transshipment. Efficient logistics and supply chain management of a particular biomass feedstock is crucial. A scenario optimization model is developed to ensure cost effective and in-time delivery of switchgrass to the biorefinery. The field operations such as harvesting and baling are weather dependent. Weather is the major factor for randomness and uncertainty in field operations. Scenario optimization techniques can capture this uncertainty. A deterministic model with 13 year different weather scenarios has been developed. Abengoa Bioenergy Biomass of Kansas, LLC (ABBK) is the focus of the case study.
Effect of forage energy intake and supplementation on marbling deposition in growing beef cattle

Oklahoma State University
Department of Animal Science
Subject Area: Whiteman Award Presentation

Our objective was to examine the effect of forage energy intake and type of fermentation on marbling deposition by stocker cattle grazing dormant native range (DNR) or winter wheat pasture (WP). Sixty-eight steers (258 ± 29 kg) were used to compare four winter grazing treatments: (1) control, 1.02 kg·hd⁻¹·d⁻¹ of a 40% CP supplement to meet their DIP requirement while grazing DNR; (2) corn/soybean meal-based supplement at 1% BW while grazing DNR; (3) WP at a high-stocking rate to achieve a low-rate of BW gain; and (4) WP at a low-stocking rate to achieve a high-rate of BW gain. Following winter-grazing, three steers/treatment were randomly selected for intermediate harvest. The WP steers were transitioned to the finishing phase, while the DNR treatments remained on summer native range prior to finishing. Winter grazing ADG was 0.19, 0.52, 0.68, and 1.37 kg·d⁻¹ (P < 0.01) for treatments 1-4, respectively. Marbling scores at intermediate harvest were 180, 217, 280, and 340 (P < 0.01), respectively, with no differences in final marbling scores. These data indicate growing programs can influence marbling deposition at the end of winter-grazing; however, final marbling scores may not be affected when cattle are harvested at a similar backfat thickness.

PERFORMANCE EVALUATION OF OFF-SHELF RANGE SENSORS FOR IN-FIELD CROP HEIGHT MEASUREMENT

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Subject Area: Physical Sciences & Technology

In-season plant height is a good predictor of yield potential, which needs to be measured with techniques of high spatial resolution and accuracy. In this study, systematic performance evaluations were conducted on three types of commercial range sensors, an ultrasonic sensor, a laser line scanner and a range camera on plant height measurement, under laboratory and field conditions. Results showed that the average errors between the measured heights and the ground truth heights were 16.2%, 12.4% and 18.9% for the ultrasonic sensor, the laser line scanner and the range camera, respectively. Considering the measurement accuracy, robustness and cost, the ultrasonic sensor and the laser range finder have better perspective to be applied in in-field, real-time high-resolution plant height measurements.

Evaluation of saltcedar effects on soil salinity and plant diversity

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Subject Area: Biological Sciences

Saltcedar introduced into the US for stream bank stabilization and landscaping, subsequently escaped intentional plantings and invaded river systems throughout southwestern US. Although invading saltcedar has been found to replace native plant species, alter wildlife habitat, flood patterns, and fire frequency, little has been studied concerning the gradient of soil changes that occur with increasing distance from saltcedar individuals. Our objective was to evaluate the "footprint" of saltcedar individuals by quantifying soil salinity (electrical conductivity) and plant species richness and diversity at increasing distance (up to 6m) from the base of saltcedar trees. We hypothesized that species diversity and soil EC would be inversely related to each other along the horizontal gradient. Twelve individual trees (2.3-3.4m canopy) were selected at the study site in southwestern KS with a 6m transect perpendicular to the tree along which 1x1m2
quadrats were sampled. Soil samples were collected for quantifying EC and plant species community composition was estimated to calculate species richness and diversity. The EC was highest at the tree base [598mhos/cm (82.7)] and decreased to 216mhos/cm (23.4) 6m away from the tree. Species richness and diversity did not decrease with increasing distance from the tree, however EC and plant species diversity were inversely related.

The Effects of Respondent Gender, Respondent Self-Esteem, and Presence of a Learning Disorder on Perceived Academic Success

Sean Simons
Scholar from Harding University
Scholar Symposium Participant
Subject Area: Social Sciences

Previous research has shown that individuals suffering from a learning disorder (LD) struggled in their peer relationships (Bruininks, 1978; Margalit & Efati, 1996; Sabornie & Ellis, 1990; Yu, Zhang, & Yan, 2005). To examine respondent gender, respondent self-esteem, and presence of a LD as functions of perceived academic success, six questions that dealt specifically with a student's academic success were analyzed. Six 2 (respondent gender) X 3 (respondent self-esteem) X 2 (presence of LD) analysis of variances (ANOVAs) were used to analyze the data. Results indicated gender was a significant main effect for all of the questions except Question 6 (Person A is going to college only because Person A's parents attended there) and Question 7 (Person A will graduate college on time). Results also indicated self-esteem was a significant main effect for all of the questions except Question 6 (Person A is going to college only because Person A's parents attended there). Finally, results showed no significant differences between scenario types for all of the questions except Question 5 (Person A will become a successful athletic trainer after graduating college).

Modified polyethylenimine used to enhance adenovirus gene delivery

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Subject Area: Biomedical Sciences

Gene therapy is defined as the treatment of human disease by the transfer of genetic material into specific cells of the patient. The field has emerged as a new method of drug delivery to treat diseases which do not respond to conventional therapies. Biodegradable polymers used to delivery plasmid DNA have found widespread use in the field as the polymer often degrade into non-toxic monomers inside the body, possesses controlled release properties, and ultimately results in gene expression. Viral gene delivery vectors are much more efficient than synthetic polymers, but viruses possess a number of drawbacks. To overcome some of the safety concerns associated with adenovirus-based vectors, we have synthesized a polyethylene glycol-modified polyethylenimine copolymer that is used to form a complex with adenovirus. Expected benefits currently being tested include (1) enhanced transfection efficiency, (2) reduced toxicity, and (3) the ability to overcome biological barriers after systemic or local administration.
Burdensomeness and Belongingness: A Moderated Mediation Between Social Support and Suicidal Ideation

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A vast literature has established the relationship between social support and suicidality. Furthermore, social support from family, friends, and significant others has been shown to affect levels of suicidality. The current study proposed that due to the interpersonal nature of social support, its relationship with suicidality may be better accounted for by a recent interpersonal theory of suicidal behavior. More specifically, it was hypothesized that the interaction between the interpersonal risk factors of Joiner’s (2005) theory of suicidal behavior at high levels would mediate the relationship between perceived social support from family, friends, significant others, and overall perceived social support. Finally, the current study hypothesized that the interaction between the interpersonal risk factors at high levels would mediate the relationship between actual social support and suicidal ideation. The current study analyzed 214 participants from a large Midwestern university in a moderated mediation model. Results of the moderated meditational analyses have significant implications for both clinicians and researchers. Overall, the results provide evidence to suggest the importance of interpersonal risk factors in the relationship between both perceived and actual social support and suicidal ideation.

Consumers’ Preference for Rice with Different Quality Levels and Storage Methods

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Subject Area: Social Sciences

With increased domestic rice consumption in U.S., rice elevators are encouraged to provide rice that best fit consumers’ demand. Rice quality in storage is affected by insect population, but the extent to which consumers recognize differences in quality due to insects, and the amount they are willing to pay for improvements in quality, are unknown. Also, two approaches used to control insects during rice during storage are calendar-based fumigation and integrated pest management. This study uses auction and choice experiments to determine the value consumers place on rice stored with reduced insect population, and the value they place on using integrated pest management storage methods rather than calendar-based fumigation.

Results indicate that consumers’ evaluation of rice quality was subjective and varied across consumers. They were willing to pay more for rice they liked better, but since different consumers preferred different qualities of rice, they were not necessarily willing to pay more for rice that is of higher quality based solely on objective standards. However, if consumers were informed that a particular sample of rice was of higher quality as determined by an objective standard, they were willing to pay more for that rice.

Consumers were willing to pay more for rice that was managed in storage using IPM methods than for rice that was managed using more traditional insect control methods, when the two approaches resulted in rice of similar quality.
In the Eye of the Beholder: Interpreting spaces of visibilities of Asian Indians in Schaumburg, Illinois

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Subject Area: Minority Issues

In the years following the passing of the 1965 Immigration Act, there has been a renewal of interest among scholars in interpreting newer spaces of immigration. With overall urban population expanding America's urban frontier, the nation's suburban areas are no longer fringes but key to immigrant settlement. Specifically, geographers have advanced studies on suburban immigrant identities while unraveling its spatial-cultural processes thereby bringing notions of place into the discussion. My dissertation research explores one such process, namely visibilities among Asian Indians in Schaumburg. This paper identifies visible and invisible spaces of assimilation that play vital roles in modifying and creating Indian identities. Preliminary research identifies some spatial-cultural negotiations within various modes of everyday activities within and outside the Indian community in Schaumburg.

Green Supply Chain Management

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Growing concern regarding the green house gas emission and continuous degradation of environment forced many organization and sectors to identify and remove more carbon emitting process and in the same time to implement best practices across the board. The origin of Green Supply Chain (GSC) goes back to 90's with major changes in business performed their operations. Globalization, Shifting of Power centers, Economic up's and down's combined with emerging markets made changes to many rules of organization and in their business domains. Organization like Wal-Mart, LG, Apple, Xstrata, Vale and many other found ways to increase profitability in going green with the increase in public attention and groundbreaking rules implemented by governments across the world. Common as well as intrinsic practice in Operation Research, Lean manufacturing, Supply Chain, Information Technology, Production Control & Planning etc were implemented successfully in various segments. In this research paper the author will discuss some of the normal yet profitable actions taken by Wal-Mart, IKEA, TMC, Xstrata Plc & LG in detail. The future action and goals set by the above organization are also discussed in great depth.

Depression and Self-Esteem in African Americans Who are Lesbian, Gay, or Bisexual

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This research investigated whether African Americans who reported being Lesbian, Gay, or Bisexual (LGB) had a high level of depression when compared to results found in research that used heterosexual African Americans. The researcher also investigated the correlation between depression and self-esteem using the Rosenberg Self Esteem Scale and the Hopkins Symptom Checklist. African Americans who self-identified as LGB and were at least 18 years of age were targeted. The sample was obtained primarily from Kansas City, MO. The researcher targeted local meeting places for gay individuals, Facebook, and used snowball sampling. The researcher found that this sample was not significantly different in the HSCL depression scores when compared to previous research that used heterosexual African Americans. This sample was also significantly lower on the RSE scores than what was found in previous studies that used heterosexual
African Americans. There was a significant positive correlation between self-esteem scores and depression scores. The methods for obtaining these participants could have been improved. While obtaining the participants who fit the criteria for this study, the researcher could have also asked if the individual knew anyone who fit the criteria as well but was not openly LGB. If individuals who were not open about their sexuality had participated in the study, the scores on the surveys may have been more reflective on this wider population. The researcher could have also spent more time with those in the LGB community to gain a sense of trust, making it easier to gather participants who were willing to take the surveys.

A Qualitative Case Study of the Chickasaw Nation's ReUse Center

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Scholar Symposium Participant
Subject Area: Social Sciences

The purpose of this study is to show how the Chickasaw Nation set its priorities to negotiate environmental concerns within their tribal community. These concerns were addressed within the tribal government and ultimately, the tribe proposed a grant from the U.S. Environmental Protection Agency. The grant awarded to the Chickasaw Nation was used to manage specific environmental problems and establish a core program for environmental protection. With this grant, the tribe created the Chickasaw Nation ReUse Center. This recycling center is located in Ada, Oklahoma, the heart of Chickasaw Nation. This center helps aide in the reduction of hazardous material that would ultimately damage the community’s environment, in addition to capturing usable material from the waste stream. This study will show how the Chickasaw Nation set priorities to address environmental concerns as well as other major issues such as education, health, and economics. When a tribe establishes their priorities according to major concerns, they can push forward out of the oppression, suppression, and challenges that would otherwise keep them immobile, thus emerging as a progressive tribe.

The Master of Love

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Subject Area: Social Sciences

People often use the phrase, “love conquers all,” but do they actually know what love is? Most people view love as something compassionate, sensitive, emotional and romantic it's what keeps two individuals together or at least, that is what we are made to believe from family, friends, classical theories, religion, customs, teachers, traditions and media. We have romantic/love movies like "Falling in Love", "Love Jones", " Love & Basketball", "Titanic", " The Notebook", "City of Angels" and "P.S. I Love you," that provides us with different scenarios of how love is found or obtained. We have music artists Romantic songs like; I Will Always Love You by Dolly Parton, Here and Now by Luther Vandross, Always and Forever by Kenny Rogers, The Greatest Love of All by Whitney Houston, Fallin by Alicia Keys and Bad Habits by Maxwell, also provide us with musical imagery of an ideal love story or what love is. This influences people to, believe that love is found in another person and that we should fall in love with our hearts and make sacrifices for that person. We have to sit back and think to ourselves, is that true love? If so, why are we constantly faced with domestic violence and divorces? According to the National Center of Injury Prevention and Control, about every 12 seconds, is involved in intimate-partner-abuse at some point in their relationship, (Domestic Violence 101: Defining Domestic Violence) It is also estimated that about 3.5 percent per 1,000 go through a divorce in the United States. (Centers for Disease Control and Prevention)

Sternberg's Triangular Theory emphasizes that love is obtained in a relationship through levels of intimacy, passion and commitment. A criticism of this theory is that an individual has to share the same level intimacy, passion and even commitment as his or her partner to even love or have a healthy relationship (SexinfoOnline.com 2010). Is it even possible to have the same level of commitment, intimacy and passion?
If so, how would we measure each component? Can the average person honestly say that they will be committed in a relationship or even want to maintain intimacy or passion after years in the relationship? Is it true love when you are told what love is or how to receive it just because it came from a parent or friend? Should love even be based off of religious restrictions even though love should be this free spirited state of being?

With life’s struggles and constant battles with the universe often test our relationships and if one is more committed than the other, then relationships are headed for failure, so where does the love go? Some individuals just cannot handle being in a relationship! If love is this complicated in our American view, then why are even considering calling it love? Maybe we should consider a new perspective about what love really is, so that we are not faced with these detrimental social issues. According to the Toltec and their techniques in the book, The Mastery.

A sterile plant growth system for turf rhizosphere studies
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Subject Area: Environmental Sciences

The plant rhizosphere has been poorly understood for centuries but the knowledge has grown recently with the development of modern technologies. The major difficulties of revealing complicated biological factors resulting from plant-microbial interactions include the lack of feasible and reliable sterile growth techniques to collect undisturbed plant root exudates. The objective of this work was to develop a sterile plant growth system which allows for collection of plant root exudates. The system allows for sterile growth conditions without microbial and other environmental interference. It allows application of biotic and/or abiotic stress while maintaining a healthy plant growth condition. The key advantage of this design is that no complicated or high-maintenance equipment is needed and it can be easily constructed with simple, non-expensive materials. Bermudagrass (U-3 type) was planted in 11 growth units under sterile conditions. Nine out of 11 growth units were kept under sterile condition for 6 weeks. The contamination of two growth units was due to bermudagrass root growth beyond the root zone and into the root exudate collection vial. Based on the results of this work, we conclude that this sterile growth system can be used in a broad range of turfgrass root exudate studies.

Isolation and characterization of an acid producing microorganism from deteriorating bridge sites
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Subject Area: Environmental Sciences

The Texas Department of Transportation believes that microorganisms may be related to abnormal deterioration of more than 20 bridge sites in Texas. Preliminary data generated at Oklahoma State University from concrete obtained from several of the impacted bridge sites indicate that in the right environment microorganisms present on the surface of the concrete produce an acid. The acid leads to severe corrosion of the concrete paste and lime stone aggregate. HPLC and Ion chromatography (IC) were used to identify the type of acid and the mechanism through which the microorganism lowers pH. IC results indicate high levels of sulfate ion concentration in microbial cultures suggesting that some of the microorganisms are sulfur oxidizers. Pure cultures of acid producers were isolated from mixed cultures using pH indicator plates. The 16S rRNA-gene of pure cultures were genetically sequenced, analyzed with the use of Basic Local Alignment Search Tool (BLAST) and were identified as Streptomyces sp. In order to confirm acid production and identify the oxidation of thiosulfate into sulfuric acid, pure cultures was grown in medium with and without thiosulfate and the pH was measured to detect acid production. The results
show that cultures with thiosulfate produce a significant drop in pH from 7 to 4, while cultures without thiosulfate remain near neutral pH. IC results also indicated high levels of sulfate ion concentration in cultures with thiosulfate supporting the hypothesis that sulfur-oxidizing microorganisms are oxidizing sulfur sources in the environment to produce sulfuric acid that in turn corrodes concrete.

**Observations of the Cellular Behavior within Regenerative Tissues**

**Kenneth Walker**

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Subject Area: Biomedical Sciences

Everyday more patients go on the transplant list in hopes of being able to acquire the organ that is needed to heal they're ailment. Therefore an alternative method is necessary to make transplantable organs available to the patients. Another method is developing regenerative tissues that are biocompatible with the body. The objective of the research was to produce chitosan and chitosan-gelatin porous structures and proceed to colonize these structures with Human Foreskin Fibroblasts (HFF-1). Chitosan and gelatin are both biocompatible and biodegradable polymers, which is a requirement for the scaffolds. The porous structures three dimensional (3-D), and hydrogels. The importance of this study is the applications in which the scaffolds can be used. The 3-D porous structures can be fabricated to replace multicellular membranes for organs. Histology of the structures will be done to determine the cellular biology and behavior in the porous structures.

**A REVIEW OF DATA FROM STUDIES OF THE RESPLENDENT QUETZAL (PHAROMACHRUS MOCINNO) ON THE CHACON FAMILY PRIVATE RESERVE AND THE UPPER SAVEGRE RIVER WATERSHED SAN GERARDO DE DOTA, COSTA RICA**

**Johnnie West**

Scholar from Southern Nazarene University  
Scholar Symposium Participant  
Subject Area: Environmental Sciences

The purpose of the Quetzal Education Research Center is to enable student research in the cloud forests of Costa Rica. Through this program, there have been many student researchers complete projects at QERC. Some of these projects have been focused on the Resplendent Quetzal. In addition, a study in requirement for a Master's thesis and a professional study have been completed in the area of San Gerardo de Dota. For this review, the main focus was to determine what information was known about the Resplendent Quetzal in the San Gerardo de Dota Valley and to determine a course for future research. Due to the time available, many research projects will require repeating, but there has been valuable information gathered over the 16 years of research concerning the Resplendent Quetzal. Future research projects should include expansion of behavioral studies, nesting tree information, dietary habitat and preference. Population censuses are necessary in the near future, and there should be consideration of other studies that are not included in these categories.
Anthropometric measures of breastfeeding infants in rural Ethiopia: Relations to parental education, family cattle ownership, maternal depression, and social support.

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Subject Area: Humanities

The study assessed associations of family variables with anthropometric measures of 6 months old infants in Sidama rural community, Ethiopia. The participants were 64 mother-infant dyads randomly selected from the community. Maternal depression was negatively correlated with social support but it was not associated with any of infant variables. Family economic status indicators, mother's education ($r = .275, p = .03$) and father's education ($r = .290, p = .02$) were associated with infant weight-for-length. Father's education and cattle ownership were correlated with infant weight-for-age ($r = .256, p = .04$ and $r = .271, p = .03$) respectively. Strong association was also found between family cattle ownership and infant length-for-age ($r = .384, p = .05$). Cattle ownership explained 14.7% of the variance in the infant weight-for-length model ($R^2 = .147, p = .01$). This study suggests the importance of economic initiatives to reduce child stunting and growth disturbance problems in Sidama rural community. Efforts also need to be made to create education opportunities to mothers and fathers.

Cartilage Tissue-Engineering with Chitosan Hydrogels
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Subject Area: Biomedical Sciences

As our average life expectancy increases, we have to find ways to deal with medical complications that are more prevalent in the older generation. Arthritis is a major issue with the mobility of our aging population and the most common form is Osteoarthritis, which consists of the mechanical degradation of the body's joints. In joints there is hyaline cartilage that surrounds the hinge and this is surrounded by synovial fluid. This fluid is comprised of chondrocytes, proteins and hyaluronic acid. Chondrocytes are the cells found in cartilage, and hyaluronic acid is a carbohydrate polymer that is a major component in the extracellular matrix. The objective of this study is to assess the physical effects of blending different molecular weights of chitosan in the formation of hydrogels. We are attempting to produce a hydrogel that is very similar to hyaluronic acid in these joints. It would then be possible to utilize these hydrogels as a scaffold for cell growth by adding chondrocytes. The potential medical implication of this study is the hope that we may be able to produce a hydrogel, seeded with chondrocytes, which can be injected into joints to promote the proliferation of cartilage to reverse the process of osteoarthritis.

Near-infrared diffuse optical tomography based on a wavelength-swept light source
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Subject Area: Biomedical Sciences

Near-infrared (NIR) diffuse optical tomography is a non-invasive imaging technology that resolves the physiologically-relevant heterogeneities of tissue scattering and absorption properties by means of photon diffusion. The measurement of diffused photon arrived at a specific detector on the tissue-applicator interface for tomography requires discriminating the source channel from which the NIR light is launched. Existing methods of source discrimination include time-based multiplexing or mechanical switching, frequency multiplexing, and spectral encoding by using either multiple laser sources or single broad-band light source. This study demonstrates a new method of source discrimination in diffuse optical tomography...
based on a wavelength-swept source. The wavelength-sweeping over approximately 10nm range and
centered at 830nm from a 4mW source was converted by a spectrometer to sequential coupling of the light
onto the illumination channels of a 20mm-diameter transverse-imaging endoscopic applicator used for
diffuse optical tomography. The CCD data acquisition was synchronized with the sequential encoding of the
light source. Diffuse optical tomography by this novel source-encoding configuration was experimentally
validated with tissue-mimicking phantoms at a data acquisition rate of 0.5 frame per second. This method of
source discrimination is indeed applicable to fluorescence diffuse optical tomography as it enables
discriminating the source that excites the fluorophore.

Long Path Broad-Band THz Transmission through the Atmosphere
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Subject Area: Physical Sciences & Technology
The purpose of this study was to investigate how the THz beam propagates through long distance in the
atmosphere which has huge potential in imaging, sensing, ranging, and especially high capacity
communication. Within the range from low frequency up to 2 THz, the ambient water vapor absorption and
the diffraction of the Gaussian beams are the two main losses to cause signal attenuation.
The most accurate and high resolution measurement of THz amplitude transmission through 6.20 m of a
controlled atmosphere with RH 51% was observed with air-tight tube reflection system that was designed
and installed by us. The frequency bands with high transmission rate can be used as 'Windows' which are
very sensitive to detect the fingerprints of some chemical materials in the atmosphere.
We also have transmitted a low-power beam of repetitive broad-band THz pulses the record distance of
167m through atmosphere at 50% relative humidity and have observed the broadened transmitted pulses
with a signal to noise ratio greater than 200. The good quality of the THz beam illustrates the THz potential
for imaging, ranging and communications in the range of a few hundred meters.

"Spiral-planar equivalence" of steady-state photon diffusion associated with a
cylindrical imaging probe
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Subject Area: Biomedical Sciences
We predict the phenomenon of "spiral-planar equivalence" for steady-state photon diffusion associated with
a cylindrical applicator. Recently we have derived a unified theory of steady-state photon diffusion in a
homogenous medium bounded either externally (referred to as concave geometry) or internally (referred to
as convex geometry) by an infinitely long circular cylindrical applicator. An interesting finding is that the
concave boundary has smaller rate of photon fluence decay in the azimuth direction but greater rate of
 photon fluence decay along the longitudinal direction, compared with a semi-infinite geometry having the
same source-detector distance. On the contrary, the convex boundary has greater rate of photon fluence
decay in the azimuth direction but smaller rate of photon fluence decay along the longitudinal direction.
These findings suggest that on the cylindrical applicator interface there exists a spiral direction (oblique to
both the azimuthal and longitudinal directions), along which the rate of photon fluence decay follows that on
a planar semi-infinite interface---which is called the "spiral-planar equivalence". Validating the "spiral-
planar equivalence" not only enriches the understanding of photon diffusion in cylindrical-interface
gometry, but also provides unique semi-infinite-based imaging application in trans-lumenal diffuse optical
sensing.
What Is the Effect of Bilateral Relations on Foreign Educational Exchange Programs to Facilitate Democracy in Authoritarian Countries?

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Subject Area: Social Sciences

What gave the impetus to the rise of democracy in Eastern Europe and the Soviet socialist republics? Undoubtedly, there is more than one right answer to this complex question. Yet, many historians and social scientists agree that foreign educational exchange programs played a pivotal role in the advent of democratic reforms in many countries.

In my research I am exploring why foreign educational exchange programs facilitate democratization in some countries but fail to do so in others. According to my theory, bilateral relations between a democratic and an authoritarian country are central to the ability of foreign educated citizens to facilitate democratization. When the relations between a democratic and an authoritarian country are conflictual, foreign educated citizens engender suspicion and mistrust from the government and thus cannot rise in a governmental bureaucracy. By contrast, under cooperative bilateral relations foreign educated technocrats are more likely to be promoted to influential governmental positions and hence institute country wide democratic reforms. My primary hypothesis is that foreign educational exchange programs facilitate democratization more if the bilateral relations between a democratic and authoritarian country are cooperative. To test this hypothesis I employ a process tracing method and a large “N” quantitative analysis.