

# POSTER ABSTRACTS

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## FOREWORD

Research represents the culmination of a learning experience and acquiring the ability to perform research is a key component of advanced degree programs. The OSU Research Symposium provides a forum for students to see the work of their peers, especially those in other departments.

The Research Symposium is a chance for students to share what they have learned through their research experiences with a larger audience. It provides a forum where students are the teachers, showcasing research projects that build on and enrich faculty work across the disciplines. It is an opportunity for students, faculty, and the community to discuss cutting edge research topics, and to examine the connection between research and education. It is a place for participants to experience the broad range of intellectual endeavors pursued at OSU.

The entire University community is invited to attend the Symposium to see the diversity of research performed by OSU graduate students. We encourage all faculty and students to attend. Some will notice that included in the abstracts are submissions by current OSU undergraduate students and students from regional colleges participating in their school's McNair Scholar's program.

One of the missions of the Graduate College at Oklahoma State University is bringing together researchers from the variety of disciplines taught at OSU. It is our hope that exposure to the breadth of research done throughout the University will provide an appreciation of the topics in fields other than our own, and perhaps even new perspectives from which to view our own work. We look forward to your participation..

## POSTER ABSTRACTS

### **An Analysis of Oklahoma Direct Marketing Outlets: A Case Study of Produce Farmers' Markets**

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**Presentation Subject Area: Biological Sciences**

Recent concerns about food nutrition and personal health have fueled the consumption of fresh produce in the United States. With this growing demand for fresh produce comes an opportunity for farmers to increase their individual returns, specifically, through the use of direct markets. The objectives of this study are: to examine consumer preferences among various marketing channels including direct marketing in Oklahoma; and to analyze the impact of various demographic variables on purchasing decisions. Specifically, this research focuses on the links between demographic factors and shopping preferences. Another important factor analyzed in the survey was demand for specific produce such as vegetables, fruit, and other agricultural items. Data from the farmers' market consumers' survey in Tulsa, Stillwater, Norman, Shawnee, Muskogee and Oklahoma City will be used to analyze consumer preferences using an ordered logistic regression analysis method. Farmers' market producers were also surveyed to support the finding. The results of the analysis will help build an understanding of farmers' market consumer characteristics that are most likely to influence some of Oklahoma's future marketing programs to increase farmers' return. The result shows that a typical Oklahoma farmers' market consumer is female, age 36 or older, highly educated, with a household income at least \$40,000, and coming from a two-person household. Out of 312 respondents, 85 percent said they would expect the produce that they buy at farmers' market would have a higher quality compared to produce at other markets. These findings were also supported by farmers' market's producer survey.

### **Effect Of Continuous Infusion Of Degradable Or Undegradable Intake Protein On Forage Intake, Digestibility And Nitrogen Balance In Steers Consuming Low Quality Forage.**

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**Presentation Subject Area: Biological Sciences**

To determine the effect of undegradable intake protein (UIP) or degradable intake protein (DIP) on forage intake, digestibility and N balance in steers consuming low quality forage, eight cannulated Angus steers ( $598 \pm 68$  kg) were assigned to a replicated 4x4 Latin square and fed ad libitum low quality prairie hay (PH; CP = 5.0). Supplemental N sources were casein and urea, which were considered as UIP or DIP sources depending on infusion site. The four supplemental treatments were: 1) control (CON; ad libitum PH); 2) undegradable intake protein (UIP; PH + 24-h abomasal infusion of casein, 55 g N d-1); 3) degradable intake protein from casein (DIP; PH + 24-h ruminal infusion of casein, 55 g N d-1); and 4) degradable intake protein from urea (UDIP; PH + 24-h ruminal infusion of

urea, 55 g N d-1). Each experimental period consisted of 10 d for adaptation and 6 d for sample collection. Total PH intake, output of feces and urine was collected daily. Nitrogen supplements were placed in water (3.6 L) and pumped at a rate of approximately 2.5 mL min<sup>-1</sup> by a peristaltic pump. Nitrogen supplementation increased (P<0.01) forage intake compared with CON, but no difference was detected among supplemental nitrogen treatments (7.1 vs 9.1, 10.3 and 10.4 kg d-1 for CON, UIP, DIP and UDIP, respectively). Organic matter digestibility (52.0%) was not influenced (P>0.25) by treatment. Fecal (42.2, 56.3, 66.6, 64.2 g d-1 for CON, UIP, DIP and UDIP, respectively), absorbed (14.7, 69.7, 69.7, 75.8 g d-1 for CON, UIP, DIP and UDIP, respectively) and urine N (19.4, 44.3, 36.3, 51.8 g d-1 for CON, UIP, DIP and UDIP, respectively) reflected (P<0.01) total N intake. Excretion routes of N differed among treatments; urinary N was higher (P<0.02) with UDIP than with DIP. In contrast, fecal N was lower (P<0.01) with UIP than with DIP. Nitrogen supplementation increased (P<0.01) N balance to a similar plane independent of source or infusion site (-4.7 vs 25.4, 33.3, 24.0 g d-1 for CON, UIP, DIP and UDIP, respectively). These data show that N supplementation for cattle consuming low quality forage can increase forage intake independent of N source or location of infusion, and alter N excretion, while maintaining similar N balance.

### **Aster Vs. UsgsAn Accuracy Comparison Of An Aster Derived Dem To Existing Usgs 30-Meter Dem.**

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**Presentation Subject Area: Environmental Sciences**

The purpose of this project is to create a 30-meter digital elevation model (DEM) from ASTER and compare the accuracy of this DEM with an existing USGS 30 meter DEM to determine if the ASTER DEM is more accurate in areas of low relief. A digital elevation model is a digital file consisting of terrain elevations (z-value) for ground positions at regularly spaced horizontal intervals (x,y value). The elevation values for areas between these ground positions are interpolated using a computer algorithm. The accuracy of a DEM depends on the source and resolution of the data samples. There are many uses for DEMs including showing terrain slope, aspect, and the delineation of watersheds. This particular project is part of a larger one that will attempt to model water flow and contamination for the Upper Auglaize watershed in west central Ohio.

### **Molecular And Immunological Analysis Of The Outer Membrane Protein Pipe From Mannheimia Haemolytica Serotypes 1, 2, And 6.**

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**Presentation Subject Area: Biological Sciences**

Mannheimia haemolytica serotype 1 (S1) is the primary bacteria isolated in Shipping Fever pneumonia of beef cattle, followed by M. haemolytica serotypes 6 (S6) and 2 (S2). Current vaccines against M. haemolytica are not fully protective, and research using M. haemolytica outer membrane proteins (OMPs) has shown promise in providing protective immunity against M. haemolytica. This

project focuses on an outer membrane protein (OMP), PlpE, commonly found in *M. haemolytica* and whether or not this protein varies among *M. haemolytica* serotypes. The genetic sequences of plpE from S2 and S6 were obtained and compared with the published genetic sequence of plpE from S1. The sequences of plpE from S1 and S6 were found to be identical. The sequence of plpE from S2 has a few differences when compared to plpE from S1, one of these being a 54 base pair deletion at the beginning of the gene. Outer membrane protein and whole cell profiles of S1, S2, and S6 were found to be similar using SDS-PAGE and Western Blot. Western Blots detected PlpE in these three serotypes, with the PlpE in S2 having a smaller molecular weight, consistent with the genetic deletion previously discovered in S2. Recombinant PlpE (rPlpE) from S2 was expressed and purified to be used in cross absorption studies with S1. Purified anti-PlpE antibodies from mouse ascites were fluorescently labeled with Fluorescein isothiocyanate (FITC) and used to determine that PlpE protrudes out from the outer membrane of *M. haemolytica* S1. Thus far, research has shown that PlpE stimulates an immune response in cattle, and suggests that PlpE is similar among *M. haemolytica* serotypes. This makes it a good candidate to be added to new or current vaccines to provide not only better immunity against Shipping Fever, but also cross-immunity against all or several serotypes of *M. haemolytica*.

### **Survey Of The Termites (Isoptera) Of Oklahoma.**

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**Presentation Subject Area: Biological Sciences**

Over 200 termite monitoring devices were installed at five sites across the state of Oklahoma. Termites were collected from September 2001 through August 2002 from active monitoring devices, as well as infested stumps and buildings. Four species of Reticulitermes including *R. flavipes* (Kollar), *R. virginicus* (Banks), *R. tibialis* Banks, and *R. hageni* Banks, as well as *Gnathamitermes tubiformans* (Buckley) were identified as endemic to Oklahoma. Survey findings extended the known ranges of both *R. virginicus* and *G. tubiformans*. The dampwood termites, *Zootermopsis angusticollis* (Hagen) and *Zootermopsis nevadensis* (Hagen), and the drywood termites *Incisitermes minor* (Hagen) and *Cryptotermes brevis* (Walker), are occasionally shipped to Oklahoma in lumber and furniture from western states.

### **Knowledge Of Teaching And Learning Literacy: Nature And Use In The Elementary School Setting**

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**Presentation Subject Area: Education**

Classroom teachers, reading specialists, learning disability teachers, speech-language pathologists, librarians and others may be involved in teaching students to read and write. They come from a variety of academic and career settings, bringing with them a potentially wide range of knowledge concerning spoken and written language learning and teaching. Although there is research concerning

the knowledge of individual teachers, there is little investigation about the nature and use of the collective knowledge of teaching professionals within a school and how this knowledge is used.

The purpose of this pilot research study is to begin examining the nature and use of knowledge about literacy in the elementary school setting. Specific research questions include the following: (a) what specific spoken and written language knowledge do elementary teaching professionals (classroom teachers, reading specialists, learning disability teachers, speech-language pathologists, librarians) have in one grade of an elementary school, and (b) how is this collective knowledge being used in the teaching of literacy at that grade level? This research study is currently in progress.

### **An Efficient Blood Vessel Detection Algorithm For Retinal Images Using Local Entropy Thresholding.**

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**Presentation Subject Area: Physical Sciences & Technology**

This paper presents an efficient method for automatic detection and extraction of blood vessels in retinal images. Specifically, we also delineate vascular intersections/crossovers. The proposed algorithm is composed of four steps: matched filtering, local entropy thresholding, length filtering, and vascular intersection detection. The purpose of matched filtering is to enhance the blood vessels. Entropy-based thresholding can well keep the spatial structure of vascular tree segments. Length filtering is used to remove misclassified pixels. The algorithm has been tested on twenty ocular fundus images, and experimental results are compared with those obtained from a state-of-the-art method and hand-labeled ground truth segmentations.

### **Characterization Of An Old-Growth Forest In The Cross Timbers Of Oklahoma**

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**Presentation Subject Area: Environmental Sciences**

The cross timbers of central Oklahoma contain relics of relatively undisturbed forested tracts dominated by 200 to 500 year-old trees. Old-growth sites occupy areas of relatively rough terrain where timber harvesting and agricultural practices have not occurred. Managers and landowners need to first understand these forests' attributes and processes before management practices, including preservation, can be implemented. We studied a 90 ha old-growth forest in Osage county, Oklahoma to determine changes in species composition and structure across three topographically distinct stands. We also determined conformity of diameter distributions to models that are commonly used to characterize old-growth forests. Species composition was similar to previous studies conducted in the cross timbers; *Quercus stellata* dominated the overstory in each stand while *Q. marilandica* was an important subordinate species. *Juniperus virginiana* was a relatively rare overstory species throughout the forest, but occupied unique microhabitats on steep rocky bluffs where escape from fire was possible. Portions of the forest may be experiencing crown closure from more open conditions; *J. virginiana* will probably increase in abundance on these sites, as indicated by the diameter distributions. Canonical correspondence analysis was used to determine how measured environmental variables influence species composition. Aspect and soil texture influenced forest structure, with tree density decreasing and canopy cover increasing from southwest to northeast facing slopes. Neither the negative exponential model nor the rotated sigmoid model accurately represented the diameter

distributions for *Q. stellata*. Deviations from these models were partially attributed to the constant or increasing abundance of saplings from smaller to larger size classes. Regeneration structure, particularly on the most xeric sites, was likely influenced by recent fires.

### **A Dispersed City: The Reevaluation Of The Tri-Cities Region Of East Tennessee, 1980 - 2000**

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**Presentation Subject Area: Social Sciences**

This project investigates the socioeconomic activity in the Tri-Cities metropolitan area of eastern Tennessee that includes the cities of Bristol, Kingsport, and Johnson City. The overall concept is to determine whether or not these three cities are still acting as a dispersed city. A dispersed city occurs when two or more smaller towns, with rural areas between each town, function as one economic area. Each town supplies specific goods and services encouraging people to travel from one place to another. Even though there are multiple towns, they depend on each other to form a functional economic area. Some characteristics of a dispersed city are as follows: towns have similar population sizes, each has a specialized economic activity, the entire region has a common government such as a legislative district, and each town is well-connected to neighboring towns providing efficient transportation routes. This study examines numerous questions related to the Tri-City area. Is the study area still actively functioning as a dispersed city or have the suburbs in the center of the study area matured and increased in urbanization? In effect, has one urban mass been created? If the center of the study area has filled in, is the study area now turning to a more traditional sprawl in an outward direction outside of the study area? Has the level of specialization for each of the three major cities in the study area decreased due to the urbanization of the study area? If the level of specialization has decreased, is the study area moving towards central place theory?

### **Effect Of An Estrogenic Implant On Performance Of Newly Received Steers And Castrated Bulls.**

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**Presentation Subject Area: Biological Sciences**

The objective of this experiment was to determine the effect of an estrogenic implant (10 mg of estradiol benzoate) on daily gain and feed efficiency of newly-received steers vs bull calves castrated upon arrival during a 42-d receiving study. A total of 104 steers (avg initial BW = 238 ± 24 kg) and 103 bulls (avg initial BW = 239 ± 23 kg) were received in two loads (one wk apart) at the Willard Sparks Beef Research Center during September 2002. At processing (d 0), bull calves were castrated using a Newberry knife and a single crimp emasculator. Calves were sorted by sex and blocked by initial BW, then randomly assigned to implant or no implant. All calves were fed a diet consisting of whole shelled corn, 49.7%; cottonseed hulls, 12%; ground alfalfa, 25%; molasses, 3%; and pelleted supplement 10.3% (DM basis). The diet was formulated for 250 kg calves to gain 1.10 kg per day.

Data were analyzed using the MIXED procedure of SAS. There was no sex x implant interaction ( $P = 0.63$ ) for overall ADG. Daily gain was greater ( $P < 0.001$ ) for steers (0.94 kg) compared with bulls (0.76 kg), and was greater ( $P < 0.001$ ) for implanted (0.91 kg) vs non-implanted (0.79 kg) calves. Dry matter intake was not influenced ( $P = 0.68$ ) by sex over the 42-d feeding period (5.72 vs 5.63 kg/d for steers vs bulls, respectively). Across the 42-d feeding period, steers had 26% greater ( $P = 0.02$ ) ADG:DMI than bulls. We conclude that an estrogenic implant administered to steer or castrated calves upon arrival at the feedlot will increase daily gain compared with non-implanted calves, and that the magnitude of the response to implant is similar in both steers and castrated calves. Despite the increased performance of castrated calves receiving an implant, both implanted and non-implanted steer calves had greater ADG and ADG:DMI than calves castrated at arrival over a 42-d receiving period.

## **A Reliable Breeding Tool To Identify Bird Cherry-Oat Aphid Tolerance In Wheat**

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**Presentation Subject Area: Biological Sciences**

*Rhopalosiphum padi*, or the bird cherry-oat (BCO) aphid, is a significant aphid pest to winter wheat (*Triticum aestivum* L.) forage and grain production in the southern Great Plains. Selection for resistance requires a bioassay that accurately predicts the direct effects of aphid feeding on root and shoot growth. Our objective was to devise a protocol that could be used in growth chambers to eventually allow discrimination among a large numbers of genotypes. Several experiments were conducted to identify optimal conditions that i) maximize differences in root and shoot growth of juvenile plants between aphid-infested and non-infested treatments, or ii) discriminate between two putative genotypes previously discovered to differ in damage caused by aphid feeding. Experimental factors considered were duration of aphid exposure, growth chamber temperature, positioning of germination pouches, and light exposure during germination. Using those results we developed the following protocol. Five seeds of a given genotype were placed equidistantly in a germination pouch and covered with sand. Ten pouches were arranged in a metal rack as five pairs of two pouches facing each other (one containing a resistant genotype and the other containing a susceptible genotype). One rack of pouches was placed in a tub containing water, azoxystrobin (fungicide), and imidacloprid (insecticide for maintaining aphid-free conditions), while another rack was placed in a tub containing water and azoxystrobin only. Each rack served as the experimental unit for replication. After seven days in the growth chamber at 21 C, nonviruliferous aphids were introduced to the tub of pouches lacking insecticide. The experiment was continued for two weeks, at which time seedlings were dried for two days and weighed for shoot and root mass. With aphid exposure, plants of the susceptible cultivar, 'Patrick', showed a 48% reduction in root mass and a 37% reduction in shoot mass.

## **Watershed Restoration Feasibility For The Washita Battlefield National Historic Site**

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**Presentation Subject Area: Environmental Sciences**

The National Park Service is exploring the feasibility of restoring a section of the Washita River within the Washita Battlefield National Historic Site (WABA) to the condition at the time of a historic battle in 1868. The purpose of the project is to describe and explain the changes to the Washita River and to suggest if restoration is possible. An overlay was produced by analyzing four sets of aerial photos from 1961, 66, 74, and 82. Observations of the overlay indicate that small sections of the river are drying up, the channel is becoming narrower, and vegetation encroachment is taking place along sandbars. A map of the watershed, including the battlefield, was compiled to locate flood control dams that the Natural Resources Conservation Service constructed during the 1960's in order to stabilize the river and prevent flooding. Records of streamflow measurements and peak flows from a gauging station located at the downstream end of the study watershed in Cheyenne, Oklahoma support observations that the river has become more stable. One negative effect of this new stability is the entrenchment of the river. It can be inferred from the data that the river has adjusted to the reduced peak flows caused by the flood control dams. If the channel is in equilibrium with the prevailing period of peak flows and sediment load then restoration may prove impractical and uneconomical. A more detailed study of the river can reveal more concerning this entrenchment and economic feasibility of restoring the river.

## **Will Smaller Retail Businesses Survive Supercenters In The New Millennium?**

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**Presentation Subject Area: Physical Sciences & Technology**

This study will 1) research the affects of supercenters on smaller retail businesses and 2) investigate the effect this relationship has had on consumer buying patterns. Previous research has focused on the impact of supercenters on grocery retailers. These studies have suggested that one stop shopping was one of the primary reasons for the change in consumer's shopping habits. These studies have also suggested that the intense competition presented by supercenters will eventually cause smaller retailers to disappear. At the same time, other studies have suggested that there is still a need for smaller retailers. In these studies, personalized service and the need to find specialty items were the primary reasons for the need of smaller retailers. The focus of this study will be the affects of supercenters on consumer buying patterns. The goal of this study is to research the affects of supercenters on smaller retailers and demonstrate how this relationship has affected consumer buying patterns.

## **Comprehending Anaphoric And Cataphoric Pronouns**

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**Presentation Subject Area: Social Sciences**

Pronouns are among the most frequently used words in the English Language (Francis & Kucera, 1982). During comprehension, a pronoun is typically linked with one or more discourse entities. A pronoun and a discourse entity are co-referent if they refer to the same individual. When a pronoun is co-referent with a discourse entity that precedes it, the pronoun is described as anaphoric, as in 1a. When a pronoun is co-referent with a discourse entity that follows it, the pronoun is described as cataphoric, as in 1b. The purpose of our research was to investigate how readers resolve co-reference for anaphoric and cataphoric pronouns.

- 1 a. After Mark arrived at the party, he felt a bit anxious. (Anaphoric Pronoun)
- b. After he arrived at the party, Mark felt a bit anxious. (Cataphoric Pronoun)

Gordon and Hendrick (1997) collected intuitive judgments from speakers of English and found that pronouns in these two sentence structures were judged as acceptable 90% and 88% of the time, respectively. These results suggest that there is a preference for the pronoun and a gender-matching proper name to be interpreted as co-referent.

We measured reading time on sentences similar to those in 1 and 2. In the sentences, we co-varied three factors: (1) order of pronoun-proper name; (2) gender match between pronoun and proper name (see examples in 2); and (3) the type of pronoun (he vs. she). A 2 x 2 x 2 repeated measures design was used.

- 2 a. After Mary arrived at the party, he felt a bit anxious. (Anaphoric Pronoun)
- b. After he arrived at the party, Mary felt a bit anxious. (Cataphoric Pronoun)

Differences in reading time were observed at the point in the sentence in which co-reference resolution, i.e., at the pronoun in 1a and 1a and at the proper name in 1b and 2b. The results indicated that readers took significantly longer to process the pronoun or proper name when there was a gender mismatch between the pronoun and proper name than when there was a gender match between the pronoun and proper name. These results suggest that when readers comprehend sentences containing anaphoric and cataphoric pronouns, similar processes are executed. Readers attempt to form a mental link between the pronoun and proper name. When the genders of the two are incompatible, readers must infer that the pronoun and the proper name refer to different individuals. This inference leads to processing difficulty, resulting in additional processing time. Implications for theories of referential processing will be discussed (Badecker & Straub, 2002; Nicol & Swinney, 1989).

## **"Conditioned Suppression: A Potential New Method For Detecting Deception."**

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**Presentation Subject Area: Social Sciences**

The purpose of this study is to develop a new method for the detection of deception. The method uses a technique borrowed from animal research in which ongoing operant behavior is disrupted by 'emotional' responses. This technique is known as 'conditioned suppression.' Participants are trained to gather 'sensitive' information from various individuals and sources. Upon 'capture' they are brought to the laboratory and 'interrogated.' Interrogation involves a computer task in which

participates are instruction to respond on a keyboard at a stable rate. This stable rate of responding is assisted by the use of a metronome which helps the subject to keep time (i.e., creates a baseline of responding). Throughout the session various pictures are presented. These pictures may or may not be associated with the espionage scenarios engaged by the participant. Preliminary data suggests that the pictures associated with the espionage scenarios produce deviations from baseline levels of responding.

### **Encouraging Female Science Students: Ability And Motivation Of Pre-Service Science Teachers To Implement Positive Teaching Strategies**

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**Presentation Subject Area: Education**

Although the gap is closing, there is still a shortage of women in the fields of science, math, engineering, and technology. Much of the literature states that female interest in science declines in middle grade years. However, there are many strategies teachers can enlist to alleviate this problem. The purpose of this study is to determine whether a group of pre-service science teachers have skills and motivation to use positive teaching strategies to encourage female students' participation in science. A survey instrument adapted from a pre-existing questionnaire (Leach, 1994) was used to assess pre-service secondary science teachers in an undergraduate methods course. There are effective strategies for supporting female students in science, yet these strategies are used infrequently. This study investigated possible reasons for the low implementation of female-friendly strategies, so that those reasons could be addressed by science teacher educators.

### **"Western Influence On Dietary Habits In The Post-Communist Czech Republic"**

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**Presentation Subject Area: Social Sciences**

The main purposes of this study were to compare nutrition behavior and to assess the extent of Western influence on dietary habits in two generations in post-communist Czech Republic (formerly Czechoslovakia). The infusion of Western culture has introduced fast-food restaurants and new food products to the country that was previously dominated by a traditional Eastern European cuisine and a strong emphasis on regional foods. Despite the positive trends that have occurred in health status of Czech people after the communist fall, the infusion of Western culture might be negatively influencing nutrition behavior and food choices of the Czech consumers. We interviewed two generations (group 1= 18-30 years of age; group 2= 40+ years of age) of 40 Czech men and women using a convenience sample. The participants were given a nutrition behavior questionnaire containing a series of questions related to the subjects' eating pattern, preference of various types of restaurants, and frequency of consumption of certain foods. The data collected from the nutrition behavior questionnaire were analyzed using SPSS 10.0. To assess the degree of Western influence on dietary habits of the younger and older generations, and men and women in the Czech Republic, the

questions from the nutrition behavior questionnaire were analyzed with two-tailed independent t-tests. Results indicated that Western influence on diet varies by generation, with the younger generation being influenced by the nutritional trends of the West to a greater degree when compared with the older generation. The younger generation had significantly higher rate of dining out for dinner meals when compared with the older generation ( $p=0.003$ ). Compared to the older generation, the younger generation had significantly higher frequency of dining in the Western-type restaurants such as Italian restaurants/pizzerias, Chinese restaurants, and fast-food restaurants ( $p=0.001$ ). The older generation tended to report eating more often in traditional Czech restaurants, buffets and cafeterias ( $p=0.075$ ). In addition, the greater degree of Western influence on younger generation was noted in comparison of convenience food consumption. The younger subjects had significantly higher consumption of instant soups, instant and frozen meals ( $p=0.003$ ). There were no significant differences between male and female subjects in the satisfaction with their diet, frequency of eating out or preference of certain types of restaurants. However, men ate in cafeterias significantly more often when compared to women ( $p=0.016$ ). In conclusion, the differences in nutrition behavior and eating preferences between the younger and older subjects indicate that the diet of younger and older generation is influenced by different factors. According to the results found in this study, nutrition behavior of the younger generation is more likely to be influenced by the Western trends. The older generation, on the other hand, shows lower preference of dining out in Western-type restaurants and slower incorporation of Western food items into their diet.

### **Calculation Of Fiber-Coupled Microsphere Whispering-Gallery Mode Spectra Using Coupled Mode Theory**

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**Presentation Subject Area: Physical Sciences & Technology**

Fused-silica fibers and microspheres under appropriate conditions function as optical waveguides. Waveguides support discrete modes (or unique spatial configurations) of the electromagnetic field. Tapering a single-mode fiber causes a portion of the field to be evanescent. This evanescent field is used to couple laser light into the microsphere. The two factors that are important in determining the amount of coupling are the amount of overlap of the fiber and sphere modes and the phase matching between them. The phase matching is determined by the propagation constants (or effective wave numbers) of the two modes.

The lowest order fiber mode is the  $HE_{11}$  mode. The next higher mode in this family is the  $HE_{12}$  mode. These modes are investigated relative to microsphere modes, because experiments indicate that the tapering of the fiber excites a higher-order fiber mode.

A mode of a microsphere is known as a whispering-gallery mode (WGM). Because a microsphere behaves as a ring cavity as well as a waveguide, its WGMs are discrete not only in spatial configuration but also in wavelength. These modes can be distinguished by their radial and polar spatial configurations. There are many possible WGMs for similar wavelengths and propagation constants.

In practice the microsphere actually has an eccentricity. This eccentricity removes the wavelength degeneracy of the polar modes. The fact that the tapered fiber is not exactly aligned with the greater circle of the microsphere increases the number of modes that are excited. With perfect alignment only

even (symmetric) polar modes are excited. Without perfect alignment the odd (antisymmetric) polar modes are excited as well. These details are included in the calculation of the WGM spectra.

The radius of the fiber is calculated so that the propagation constant of its  $HE_{11}$  mode is the same as that of the microsphere's fundamental transverse electric WGM. As the wavelength of the light is varied, the possible WGMs are determined. Coupled mode theory is applied to numerically calculate the strength of the coupling from the tapered fiber. The resulting coupling coefficients are equivalent to the transmission coefficients for partially reflecting mirrors.

## **Developing The Adapted Life Cycle Assessment To Assess The Environmental Performance Of Industrial Processes In The Context Of Sustainability**

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**Presentation Subject Area: Physical Sciences & Technology**

Sustainability involves a wide range of concerns that people need to pursue 'the reconciliation of society's development goals with the planet's environmental limits over long term.' The environmental considerations are one of the 'Triple Bottom Lines' of sustainability. This research presents a set of quantitative gauges to quantify the environmental performance of industrial processes in the context of sustainability. Life Cycle Assessment (LCA) is an internationally recognized method for environmental impact assessment, which is applied as the framework in this study. However, LCA is rebuilt to incorporate sustainability considerations and accommodate the requirements of evaluating a single process, instead of the 'cradle-to-grave' chain. Eight environmental impact categories (Global warming, stratospheric ozone depletion, ground ozone formation, acid deposition, eutrophication, human health, eco-toxicity and energy consumption) are elaborated in terms of differentiating sources, mechanisms, media and effects. Novel characterization techniques as well as fate, exposure and effect models are investigated to generate the best scientific indicators. The resulting measures will be embedded into optimization models in future research.

## **Distribution And Partial Characterization Of Pbj<sub>s</sub>, A Novel Plasmid Of The Phytopathogen Spiroplasma Citri**

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**OSU**  
**Presentation Subject Area: Biological Sciences**

*Spiroplasma citri* strains contain several extrachromosomal DNAs, most functions of which are unclear. The arp1 gene, encoding spiroplasma adhesion related protein1 (SARP1) in *S. citri*, was previously cloned and characterized from *S. citri* BR3-T (GenBank accession no. AJ297706), which also contains a related gene, arp2. Here, the distribution and partial characterization of a novel plasmid from *S. citri* BR3-3X, from which BR3-T was derived, is reported. Plasmid DNA prepared from several *S. citri* strains and spiroplasma species were used in Southern blot-hybridization with an arp-specific probe and a probe made from the plasmid DNA of *S. citri* BR3-3X. BR3-3X plasmid and chromosomal DNAs were used as templates in PCR of the 3' regions of arp genes. Plasmids of *S. citri* strains BR3-3X, BR3-G, BR3-T, BR3-M, BR3-P, of the phytopathogen *S. kunkelii* CR2-3X and

of *S. melliferum*, all members of group I, reacted with both arp and plasmid probes. However, *S. citri* strains ASP-1 and R8A2 reacted only with the plasmid probe. *S. citri* strain Beni Mellal, *S. floricola* and the phytopathogen *S. phoeniceum* reacted with neither of the probes. The arp-reactive plasmid of BR3-3X was found to be 7 kbp by MboI digestion and was designated pBJS. Higher sequence identity of pBJS with AJ297706 than with an arp2 sequence suggested plasmid location of arp1. The sequence of the chromosome-derived PCR product resembled arp2 more than AJ297706 suggesting that arp2 resides on the chromosome. A blastn search of the available genome sequence of the phytopathogen *S. kunkelii* CR2-3X revealed two arp1-like genes, but no significant matches were found in the sequence databases of fellow mollicutes *Mycoplasma genitalium*, *M. pneumoniae*, *M. pulmonis* and *Ureaplasma urealyticum*, zoopathogens, either after blastn or tblastx searches. pBJS is a novel *S. citri* plasmid that encodes SARP1 and shows limited conservation among spiroplasmas and other mollicutes. No clear association of pBJS with insect transmissibility or plant pathogenicity was revealed.

## **Customer Profitability Analysis With Activity Based Costing System In The Lodging Industry**

**Islam Karadag and Woo Gon Kim**

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OKLAHOMA STATE UNIVERSITY**

**Presentation Subject Area: Environmental Sciences**

**PROBLEM STATEMENT** The traditional accounting systems used by lodging companies cannot help managers to identify which business activities do really make profit. Hotel companies need exceptional marketing strategies to find and retain customers who deliver long-term profits to the business. The traditional profitability analysis based on accounting data is questioned as to its relevance to marketing profitability. The current accounting practices suggested by the Uniform Systems of Accounts for Lodging Industry (USALI) classifies hotel departments as profit and cost centers. Determining which customer segments are profitable is an unknown question. In contrast to the current accounting applications, marketing people focus and evaluate operations on market segments. This is a gap between accounting and marketing functions.

**THE PURPOSE OF THE STUDY** The purpose of this study is to describe how Activity Based Costing systems together with Customer Profitability Analysis. This study will discuss the importance of cost allocation and how it can provide new insights to marketers by recasting the accounting information that drives much marketing decision-making.

**SIGNIFICANCE OF THE STUDY** The contribution of this study to the hospitality accounting literature will be the following: 1.To find out the common costing methods in lodging industry and the perception of managers in terms of using new cost approaches for marketing decision-making. 2.To integrate the customer profitability literature with marketing and management accounting and illustrate a market segment profitability model that includes a cost model using ABC analysis in lodging industry.

**LITERATURE REVIEW** Market Segment Profitability Analysis (MSPA) is a technique developed by Dunn and Brooks (1990) which will help to approach the development of the accounting-marketing interface in hotels, improving the current provision of information, and subsequent decision-making. Noone and Griffin (1997) explored potential costing techniques for MSPA application and proposed that activity-based costing (ABC) is an appropriate and effective costing method to apply in MSPA in a hotel environment. Another revenue enhancement technique in

lodging industry is profit analysis by segment (PABS) developed by Quain (1992). PABS uses a combination of marketing information and cost analysis. It identifies average revenues generated by different market segments, and then examines the contribution margin for each of those segments by considering the cost of making those sales.

**RESEARCH METHODOLOGY** The subjects of this study are the hotel controllers, working in hotel properties in the United States. The sample selected from the membership database of Hospitality Financial and Technology Professionals (HFTP). This survey carried out with 853 controllers. They were invited to visit our web page and requested to fill out the web-based questionnaire. 220 e-mail did not reach the controllers with different reasons and 140 controllers responded the questionnaire with the 23 per cent usable rate.

**DATA ANALYSIS** The data collected on each return usable questionnaire will be entered into a program using Statistical Packages for Social Sciences (SPSS 10.0) for windows. Standard statistical procedures, such as frequency, cross tabulation, one-way analysis of variance, and logistic regression will be used to analyze the data.

## **The Impact Of Violence On Learning: Making Learning Organizations Safe**

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**Oklahoma State University**  
**Presentation Subject Area: Education**

This paper addresses and explores the complex issue of violence and its impact on literacy learning. The paper begins with a discussion on brain development. The impact of violence on the developing brain is addressed. Various physical, psychological and emotional changes resulting from this trauma provide accumulating evidence that suggest violence is associated with barriers to learning. Drawing on the findings from Jenny Horsman, researcher on violence and literacy learning, Bruce D. Perry, M.D., Ph.D., director of the Child Trauma Academy, and a panel of experts from a Delphi study, this paper will provide a greater understanding of what is know about the impact of violence on literacy learning. These findings are by no means complete or even exhaustive, but should provide support for creating learning organizations that offer a safe environment in which to learn.

## **The Metabolism Of Phenobarbital By Human Intestinal Microflora**

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**Oklahoma State University - STW**  
**Presentation Subject Area: Biological Sciences**

Intestinal microflora are involved in metabolizing a number of xenobiotics, which are passed through the digestive tract. The human intestinal tract is very complex as it contains more than four hundred different bacterial species. A previous studying this laboratory showed that the major intestinal strain Bifidobacterium has the metabolic capacity to break down the xenobiotic, Phenobarbital. Phenobarbital is used in the treatment of epilepsy and is also known to be an inducer of hepatic cytochrome P450. Specifically, Bifidobacterium adolescents and Bifidobacterium bifidum produced an extended lag time with heightened concentration of Phenobarbital. In addition, Gas chromatography-mass spectrometry showed the generation of the compound, benzeneacetamide, from Phenobarbital. To determine whether Phenobarbital is metabolized by other major intestinal

species, the current study tested five different intestinal strains, *Bacteroides fragilis*, *Enterococcus faecalis*, *Eubacterium aerofaciens*, *Clostridium perfringens* and *Staphylococcus aureus*, and their response to Phenobarbital. Growth analysis at different concentrations of Phenobarbital and the Gas chromatography-mass spectrometry analysis were used to determine the effects of Phenobarbital on these strains, and to determine whether metabolites were produced from Phenobarbital. The growth curve analysis did not display a significant extended lag time at higher concentrations of Phenobarbital for the strains tested. An analysis of the Gas chromatography-mass spectrometry data showed no metabolite production but did show a lower yield of Phenobarbital in the *Clostridium perfringens* culture. The conclusion of the study showed that *Bifidobacterium* is unique in its metabolic capacity as it reductively cleaves Phenobarbital into benzeneacetamide.

## **Arkansas River Quaternary Aquifer, Characteristics And Water-Quality, Osage Reservation, Northeastern Oklahoma**

**Shana Mashburn, Caleb C. Cope, James O. Puckette, Marvin M. Abbott**

**Department of Geology  
Oklahoma State University**

**Presentation Subject Area: Physical Sciences & Technology**

Increasing demand for water on the Osage Reservation led to an evaluation of shallow ground-water resources within the alluvial and terrace deposits along the Arkansas River. This research provides information that can be used for development of the Quaternary aquifer for future ground-water supplies in the Osage Reservation. The objectives are to describe aquifer thickness, determine grain size distributions for alluvium and terrace sediments, estimate hydraulic conductivity for alluvium and terrace sediments, and illustrate water quality. The project area included approximately 116 square miles of the Arkansas River valley and the nearby upland areas along the Osage Reservation side of the river. The area included the river reach down stream from Kaw Lake to upstream of Keystone Lake near Cleveland, Oklahoma. The altitude ranges from 945 feet above sea level on the alluvium below the dam on Kaw Lake to 725 feet on the alluvium west of Cleveland, Oklahoma along 94 miles of the Arkansas River. Mean annual precipitation across the study area ranges from 34 inches near Ponca City to 37 inches near Cleveland (Oklahoma Climatological Survey, 1999). A truck mounted direct push tool was used to make 103 temporary test holes. No materials were permanently installed in the aquifer. Electrical conductivity logs were produced for each test hole to define thickness and to estimate sediment size of the aquifer. Sediment cores were extracted from 20 of the 103 test holes for grain sizes analyses and to aid in interpreting sediment sizes from the electrical conductivity logs. Grain size distributions were used to estimate possible hydraulic conductivity values using the Hazen method (Hazen, 1911). Water samples were collected for water-quality field analysis at each test hole yielding a sufficient amount of water. For this study, nitrate and dissolved solids concentrations were used to define water quality conditions. Nitrate concentrations were measured using cadmium reduction/azo dye formation method. Specific conductance was measured with a hand-held meter. Specific conductance is directly proportional to dissolved solids concentration. Greater specific conductance values indicate greater dissolved solids and vice versa. Dissolved solids in milligrams per liter (mg/L) were estimated for the Quaternary aquifer by multiplying the specific conductance values by 0.55. This constant was estimated from water quality data from domestic wells in the Quaternary aquifer in the Osage Reservation (Abbott, 1997). Water yields in the Quaternary sediment along the Arkansas River are restricted to the alluvium and consists of gravels and sands in the Osage Reservation. Terrace deposits, which appear to be primarily eolian, are silt-rich and do not contain sufficient yielding water. The terrace deposits were generally thicker than the alluvium deposits across the study area. Estimated hydraulic conductivity values for alluvium

sediments were greater than the hydraulic conductivity values for terrace sediments. Water quality results show nitrate and dissolved solids concentrations were mostly within EPA drinking water standards.

## Synthesis And Characterization Of New Members Of The 1,4-Dihydropyridine Family Of Calcium Beta Blockers

Chance Matthiesen and E. M. Holt

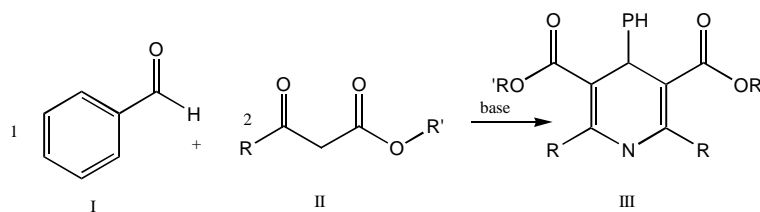
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Presentation Subject Area: Physical Sciences & Technology

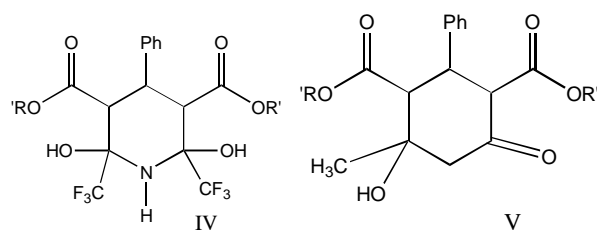
Calcium beta-blockers are used in the treatment of angina and hypertension. 1,4-Dihydropyridine derivatives (DHP's)(III) constitute one of the most commonly prescribed families of these drugs. In order to diminish the quantity of medication that a patient might need to ingest, there is great interest in producing DHP molecules of greater activity. Structure activity relationships have shown that the presence of fluoride substituents on the DHP framework leads to high calcium blocking activity. Thus we have focused on the synthesis and characterization of new members of the DHP family with fluoride substitution on various positions.

The usual synthesis of DHP molecules is carried out by the Hantzsch reaction of an aldehyde(I) with two molecules of an active methylene compound(II) in the presence of a base.



We have found that the identity of the base makes a difference in the structure obtained. NH<sub>4</sub>OH as the base, serves a twofold function, removing the active methylene hydrogen of II, but also participating in the ring closure reaction leading to III. We have made a series of compounds in which the aromatic ring of aldehyde I is substituted with one or more fluoride atoms or with perfluoroalkyl groups.

When NH<sub>4</sub>OH is used as base and the R group of II is a perfluoromethyl group, the product is of the type (IV), formed by the classic Hantzsch mechanism unexpectedly without the final dehydration steps. The product shows increased hydrogen bonding capabilities at the nitrogen end of the DHP molecule. When piperidine is used as the base, DHP molecules of type V are isolated. These are formed via a ring closure reaction



involving the R group of one of the molecules of the active methylene compound (II).

We have characterized these new compounds by IR,  $^1\text{H}$  and  $^{13}\text{C}$  NMR and by single crystal X-ray diffraction.

## Two Studies Examing Lefebvre's Algebraic Model Of Conscience

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**Presentation Subject Area: Social Sciences**

Two studies were conducted to assess Vladimir Lefebvre's algebraic model of conscience. This algebraic model allows point predictions of positive judgments about the self, positive judgments about others, like-self judgments when the self was rated positive, and like-self judgments when the self was rated negative. In the first study, we attempted to replicate a number of results reported by Lefebvre, Lefebvre, and Adams-Webber (1986). In our replication study, participants rated themselves on fifteen bipolar adjective terms selected from the semantic differential scale. The participants then rated, in random order, eighteen other people, half of who were considered positive (e.g., 'close friend') and half of whom were considered negative (e.g., 'disliked person'). The participants also completed a number of short inventories to assess emotional well-being and self-esteem. Two out of the five portions (i.e., like-self judgments and like-self judgments when the self was rated negatively) were not statistically different than portions predicted by Lefebvre's model. Hence, only two observed proportions supported the model in the replication study. For a more conclusive test of the model, a second study was conducted, improving methods and modeling procedures. In this second study participants rated themselves and others on one of three sets of bipolar adjectives. The first set was again sampled from the semantic differential scale, the second set was sampled from available markers of the Big Five personality traits, and the third set varied from participant to participant as each person in the study provided his or her own unique bipolar adjectives for the rating procedures. The participants were also asked to first judge which end of each dichotomy they considered to be positive or desirable. Again two out of the five portions supported the algebraic model, however, the portions supported in the second study were positive judgments about the self and positive judgments about others. Despite these inconclusive results, psychologists can rarely make point predictions, and the large samples in these studies provided a high degree of precision in estimating the population proportions. Consequently, the fact that several of the predictions were supported indicates that Lefebvre's model may still prove useful in modeling how individuals rate themselves and others on bipolar scales.

## **Association Of Colors And Emotions: Differences Between American Culture And Asian Culture**

**Samantha Mize and Dr. Jim Watson**  
**Department of Design**  
**University of Central Oklahoma**  
**Presentation Subject Area: Humanities**

Throughout history colors have constantly been associated with emotions. One can feel blue, be green with envy, or be a yellow-bellied coward. While these sayings are not exactly scientific, past research in the field of color psychology indicates there is a positive correlation between colors and emotions. However, research has not been done to determine if you can be green with envy in Japan as well as in the United States. The goal of this study is to determine if culture influences the associations of colors with emotions. The researcher will focus specifically on the American culture and the Asian culture in Japan and China. International businesses and organizations will be able to use the results of this study in design and advertising as well as other areas. The results will also lay a foundation for future research on the subject, such as why cultural differences exist or why they do not exist.

## **Evaluating Students' Perceptions Of Psychology As A Science In Industrializing Countries: Validation Of A Self-Report Measure**

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**Oklahoma State University**  
**Presentation Subject Area: Social Sciences**

Education in psychology emphasizes the scientific method as the basis for knowledgeable claims about thought and behavior. Evaluation of students is mostly done in terms of their mastery of methodological and statistical principals, however little attention has been given to observing the degree to which students categorize psychology as being, indeed, a science. Numerous studies have validated a self-report measure of this construct. Previous observations of this notion have been considered in industrialized countries; however this construct had not been assessed in developing countries in which their perception of science can be biased due to their lack of fundamental scientific knowledge. The Psychology as Science (PAS) Scale has proven to be a reliable measure that predicts a variety of construct-relevant attitudinal and performance criteria. Using the PAS scale we have assessed students' perception of psychology as a science in Brazil and findings will be discussed.

## **The Effects Of Self Efficacy And Competence On Act Achievement Scores In Math And Science**

**Sandrilee Moynihan**  
**Department of Management**  
**Oklahoma State University**  
**Presentation Subject Area: Education**

This study used multiple regression analysis to examine the effects of self efficacy and competence on academic achievement as measured by ACT achievement scores in math and science for fifty high school students. The three research questions addressed were: 1) Is perceived efficacy for self regulated learning related to academic performance in science and math?, 2) Do competency beliefs about being effective in the academic domain relate to academic performance in science and math? , 3) Is variability in Math and Science ACT scores better explained by ACT scores in a related domain or by self efficacy or competence? For this study the operationalized definition of self efficacy for self regulated learning is the score from Bandura's self regulated learning subscale (Bandura, 1996). Competence is defined as the sense of being effective in the academic domain (Harter, 1982) and is operationalized for this study using Harter's Perceived Competence Scale. Academic achievement is operationalized for this study as the ACT scores within the different academic domains of Math and Science. The results would suggest that high school students who perceived themselves as more competent or effective in the academic domain tended to have higher academic performance. Math competence was the most significant predictor for Math ACT and accounted for about 31% of the variability. However, Math ACT was the most significant predictor for Science ACT and it accounted for about 26% of the variability. The results of Lent et al (1991) would suggest that Math ACT acts as an informational source for mathematics efficacy. Additional research and testing to determine the extent that knowledge of ACT scores acts as an informational source for efficacy may further the development of predictive and explanatory models in this area. Testing with a larger sample size and more inclusive measure of competence is necessary in order to generalize from this study.

## **Using Software Agents To Index Data For An E-Travel System**

**Andy Nauli**  
**Department of Computer Science**  
**Oklahoma State University**  
**Presentation Subject Area: Physical Sciences & Technology**

Internet-based travel support systems became one of the fast growing areas of e-commerce. Unfortunately, most of existing e-travel systems deal only with a relatively limited number of travel choices (e.g. airline, accommodation and car reservations). At the same time, Internet contains a much larger amount of data that can be of potential interest to travelers (e.g. restaurants, historical monuments, museums etc.). It is our belief that an ultimate e-travel system should combine all of the pertinent travel information. To achieve this goal it is necessary to develop a system for efficient gathering and storing travel related content. In our system design we follow the indexing-based approach endorsed by Abramowicz et. al. [1]. We also propose that the content gathering functionality will be implemented using the agent technology. In the presentation we will, first, discuss the problem of indexing information from the Internet, with the goal of delivering personalized content to users of an e-travel system. We will present the form of index tokens that will be stored in the system and describe an agent-based subsystem (of our e-travel system) designed to support the indexing function. We will also briefly sketch the important issues that will have to be tackled in our research for the search agents to be agile, intelligent and efficient.

## **Rock Glaciers On Mars**

**Christopher Neel, Marston, Vitek, Degenhardt, Giardino**  
**Department of Geology**  
**Oklahoma State University**  
**Presentation Subject Area: Environmental Sciences**

The purpose of our study is to better understand geomorphic controls on ridge and furrow topography on terrestrial rock glaciers to facilitate identification of rock glaciers on Mars. Rock glaciers move by slip, flow and/or creep deformation that often produces distinctive ridges and furrows perpendicular to the flow direction. Recent findings from the gamma ray spectrometer aboard Mars Odyssey provide evidence that near-surface ground ice is abundant in the regions where suspected rock glaciers have been observed. Our study focused on rock glaciers in Yankee Boy Basin, Blue Lakes Basin, and Silver Basin of the San Juan Mountains and Mt. Mestas of the Sangre de Cristo Range, both in Colorado. We seek to develop criteria to better identify rock glaciers on imagery from the Mars Global Surveyor Orbiter. We are also utilizing ground-penetrating radar (GPR) to discern the internal structure of a lobate rock glacier in Yankee Boy Basin for the purpose of better understanding the origin of ridges and furrows. The spacing between ridges on terrestrial rock glaciers is most closely related to the rock glacier slope and the height of source areas for the rock debris. We are developing similar models for possible rock glaciers on Mars. Our GPR work revealed that the rock glacier in Yankee Boy Basin consists of parallel to sub-parallel units of layered ice-rich and ice-poor strata. Overlap exists in the major depositional units corresponding to flow lobes, and layers within these units have been deformed primarily by folding. These features are consistent throughout the entire thickness of the rock glacier. Our search for rock glaciers on Mars has focused on latitudes above 35 degrees, including the Argyre and Hellas impact basins; Deuteronilus and Protonilus Mensae in the fretted terrain; and the volcanic mountains of Hecates Tholus and north of Olympus Mons. A particularly strong candidate for a rock glacier exists in the central region of Dao Vallis.

## **Arboretum Management Utilizing Gps And Gis**

**Justin Plymell**  
**Department of Geography**  
**Oklahoma State University**  
**Presentation Subject Area: Physical Sciences & Technology**

This project focuses on the development of an on-line GPS/GIS map. The researcher collected GPS (Global Positioning System) data from the OBGA's (Oklahoma Botanical Garden and Arboretum) sixty acre arboretum. The researcher recorded the data with a Trimble GPS receiver, manipulated the data in Pathfinder Office and ArcView 3.3, and displayed the resulting map on-line using ArcIMS. This on-line map will serve as a management tool for the curators of the OBGA and as an educational tool for not only Horticulture and Landscape Architecture students, but also for the public.

## **Identification Of *Cercopithecine Herpesvirus 16* Genes Responsible For A Neurovirulent Versus Apathogenic Phenotype In Mice**

**Kristin M. Rogers, D.H. Black, J.W. Ritchey, and R. Eberle**  
**Department of Veterinary Pathobiology**  
**OSU**

**Presentation Subject Area: Biological Sciences**

Recent comparative testing of the pathogenesis of simian alpha-herpesviruses found that *Cercopithecine herpesvirus 16* (HVP-2) is nearly as neurovirulent in mice as *Cercopithecine herpesvirus 1* (monkey B virus; BV), a BSL-4 agent. To confirm the results of this study, 15 HVP-2 isolates representing several baboon sub-species from various primate centers were inoculated intramuscularly into mice. A number of these isolates readily invaded the central nervous system and caused extensive destruction of neural tissue resulting in paralysis and death. In contrast, other isolates caused no clinical signs of disease and histopathological examination revealed no signs of viral infection. Although sequencing of a phylogenetically informative 1.1 Kbp region from 22 HVP-2 isolates showed very little difference between strains, the isolates did divide into two phylogenetic groups that correlated 100% with the neurovirulence phenotype observed in the mice. A number of genes in the human herpes simplex viruses and other closely related alpha-herpesviruses have been shown to affect the neuropathogenesis of these viruses. Select homologous genes from HVP-2 strains representative of each neuropathogenic phenotype were amplified by PCR and sequenced to identify differences in HVP-2 genes that could account for the dichotomous neurovirulent phenotypes seen in the mice. Sequence analysis of HVP-2 genes completed to date has revealed consistent subtype-specific genetic differences that correlate with the two neuropathogenic phenotypes. Further molecular analysis of these HVP-2 genes will attempt to determine their contribution to the neuropathogenic phenotype of each of the two HVP-2 strains.

## **"Oral Reading Fluency: A Predictor Of Reading Proficiency In Fifth Grade Students?"**

**Stephan Sargent and Stephan E. Sargent**  
**Department of STCL**  
**OSU**

**Presentation Subject Area: Education**

This quantitative study examined whether selected measures of reading could predict fifth grade students' reading proficiency as measured by a standardized criterion-referenced achievement test of reading. Research has established that oral reading fluency has a strong relationship with reading comprehension. While the relationship between oral reading fluency and norm-referenced tests has been researched, the relationship between oral reading fluency and criterion-referenced tests of reading has not been thoroughly documented. Since the early 1980's, fluency has been described as a 'neglected goal' and 'missing ingredient' in reading instruction. Traditional reading instruction has included word attack and comprehension skills, yet fluency has been and still is often omitted. Recent trends have brought fluency back into the awareness of educators. In 1992, the National Assessment of Educational Progress (NAEP) began testing fourth-graders' reading fluency throughout the United States. They found a clear link between fluency and reading proficiency. Because fluency has been shown to have a reciprocal relationship with reading, its inclusion in reading instruction and assessment is imperative. When fluency improves, reading comprehension often does as well. Conversely, when reading comprehension improves, one often finds fluency improves. However, many teachers do not currently include fluency in their instruction or assessment of reading. Also, educators need to discern that oral reading fluency in fact gives an accurate estimate of reading

proficiency, which corresponds to state mandated measures of reading comprehension. By identifying a parsimonious way to measure children's reading proficiency, time, cost, and resources can be conserved and used more prudently. This study addressed these issues. **METHOD:** Participants in this study were fifty-two (n=52) fifth-grade students located in a community of the Midwestern United States. The students were given the Gates-MacGinitie Reading Test (GM), San Diego Quick Assessment Test (SQ), Curriculum- Based Measures of oral reading fluency (CBM), Ekwall Comprehension Questions (E), and the Multidimensional Fluency Scale (MFS) at the beginning of the school year. In the spring of the same school year, they completed the Oklahoma Criterion Referenced Test of Reading, a state-required criterion-referenced test. Multiple regression analyses were used to examine the individual as well as the shared contribution of each of the test scores (predictor variables) to the students' performance on the criterion-referenced test (criterion variable). **RESULTS:** The results revealed that selected reading tests mentioned above, administered together or individually, could be used to predict fifth grade students' reading proficiency. Multiple regression analyses showed that taken together, four of the five predictor variables (CBM, E, GM, and SQ) accounted for 51% of the variance ( $R^2=0.51$ ). In addition, two combinations of three tests (E, GM, SQ; CBM, E, GM) explained 49% of the variance ( $R^2=0.49$ ), while two combinations of two tests (GM, CBM; GM, SQ) accounted for 46% of the variance ( $R^2=0.46$ ). Finally, a single test (GM) explained 40% of the total variance ( $R^2=0.40$ ). All relationships between the dependent and the criterion variables were statistically significant.

### **The Eden Alternative: Nursing Home Employees' Perceptions Of The Effects Of The Eden Alternative On The Residents' Quality Of Life**

**Darla Sherman and Dr. Doug Reed**  
**Department of Gerontology**  
**University of Central Oklahoma**  
**Presentation Subject Area: Social Sciences**

Most people are reluctant to live in nursing homes, or to have their loved ones admitted to a nursing home. Dr. William H. Thomas believes this can be changed. He has designed the Eden Alternative program allowing pets, plants and children to create a home-like environment for nursing home residents. Several studies have shown that the Eden Alternative program does improve the quality of life for nursing home residents. The purpose of this study is to discover if the employees of nursing homes believe that the Eden Alternative program has improved the quality of life of their residents. The researcher distributed a survey to the CNAs currently working at an Eden facility. This survey allowed the employees to express their opinions on various aspects of the Eden Alternative program and its effect on the residents. The results of this study indicated that nursing home employees believed the Eden Alternative program did improve the quality of life of their residents. These results can be used to support further studies that recommend the implementation of the Eden Alternative program at non-Eden facilities.

## **Formal Techniques For Analyzing Business Process Models**

**Eswar Sivaraman and Dr. Manjunath Kamath**  
**Department of Industrial Engineering**  
**Oklahoma State University - Stillwater**  
**Presentation Subject Area: Physical Sciences & Technology**

This poster presents a comprehensive overview of issues and opportunities in the areas of business process modeling with specific relevance to process automation. The needs for automated control and coordination of business processes necessitates that the process, by design, be correct. Current research related to developing analysis techniques for verifying the correctness of a process's design, and other promising research questions are outlined.

## **Measuring Urban Growth In Oklahoma City Since 1960**

**Chuck Sloan**  
**Department of Geography**  
**Oklahoma State**  
**Presentation Subject Area: Physical Sciences & Technology**

This research will show the results of using various forms of historical data to effectively map the urban growth of Oklahoma City since 1960. It will also provide a framework for developing a methodology to measure urban development using Geographic Information Systems (GIS) technology to show what data can be employed, the criteria for delineating urban from non-urban and alternative methods of urban growth measurement. The use of GIS will provide the necessary tools to successfully measure the amount of growth and the rate of growth in Oklahoma City for each decade i.e. 1960, 1970, 1980, and 1990. The results of this method will show growth trends in Oklahoma City and may give some insight into the direction of urban development in the future. This method of compiling different sources of data will offer a more accurate appraisal of urban growth and may build a better, more precise, model to predict for future growth within the urban context.

## **A Machine Learning Approach In Multisource Geospatial Data Classification**

**Xiaomu Song and Guoliang Fan**  
**Department of School of Electrical & Computer Engineering**  
**Oklahoma State University**  
**Presentation Subject Area: Physical Sciences & Technology**

Multisource geospatial data is a database that includes multispectral satellite image and different Geographic Information System (GIS) data. Those data are registered and aligned with reference data, which indicates the cluster type or other ground truth information. Traditional classification of geospatial data is usually based on multispectral image data. In recent years, people have proved that the combination of GIS data with imagery can improve the classification accuracy. In the project of Automated Feature Information Retrieval System (AFIRS), one of machine learning based approach, decision tree classifier, was adopted to develop an efficient data classifier to find out the region of Conservation Reserve Program (CRP) in the Texas County, Oklahoma from multisource geospatial data. Decision tree is a connected tree built from a training set, and it represents rules underlying data with hierarchical and sequential structures that recursively partition the data. In AFIRS, a tree

classifier is applied to the database with an information theory based partition criterion and an optimization process where we can prune the tree structure based on the training data itself, so that the effect of overfitting will be well reduced. The simulation results show that GIS data are helpful to improve the classification accuracy, and decision tree classifier works more efficient than traditional statistical model based approaches, especially when the size of the database is large.

### **Selenium And Iodine Depletion Affect Growth, Bone Density And Microarchitecture In Rats.**

**Fanta Toure, Edralin A. Lucas, Jarrod B. King, Bahram .H. Arjmandi, and  
Barbara J. Stoecker  
Department of Nutritional Sciences  
Oklahoma State University  
Presentation Subject Area: Biological Sciences**

Selenium and Iodine Depletion Affect Growth, Bone Density and Microarchitecture in Rats. Fanta Toure, Edralin A. Lucas, Jarrod B. King, Bahram H. Arjmandi, and Barbara J. Stoecker. Nutritional Sciences, Oklahoma State University, 425 HES Stillwater, OK 74078. Deficiencies of iodine and selenium have been reported in a number of countries in the developing world. This project investigated the effects of experimental selenium and/or iodine deficiency on bone metabolism in young rats. Experimental diets were begun after 1 week of lactation. Pups were weaned at 3 weeks of age and a subsample of males and females were fed the experimental diet of their mother for an additional 7 weeks. Weight gain was significantly impaired by iodine deficiency in all rats and by selenium deficiency in male rats. Thyroid weights were significantly increased by iodine deficiency but not by selenium depletion. Iodine deficiency decreased thyroxine (T4) and adequate Se tended ( $p < 0.06$ ) to decrease T4. Triiodothyronine (T3) was significantly higher in female than male rats. Tibia, femur and vertebrae were scanned using a Hologic 4500A dual energy bone densitometer and small animal software. Iodine deficiency decreased bone mineral area and bone mineral content in both the tibia and femur. In male rats, selenium depletion significantly decreased bone mineral area, content and density of tibia and vertebra. High-resolution micro-computed tomography of vertebrae showed that trabecular number was significantly lower in males than in females and trabecular separation was greater in males than females. The more rapid growth rate of male rats may have exacerbated their selenium deficiency compared to female rats. (Supported by Oklahoma Agricultural Experiment Station).

### **Hardware Efficient Octaphase-Shift Keying Detector**

**Shyam Sunder Uma Chander, Amjad Awawadeh, Andoche Kichenaradjou,  
Micheal A. Soderstrand  
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Oklahoma State University  
Presentation Subject Area: Physical Sciences & Technology**

A very simple LMS-based adaptive notch filter implemented in FPGA's can be used for carrier recovery of an Octaphase shift-keying signal. The key aspect of our paper lies in the alternative approach in the realization of carrier frequency detection or synchronization circuit. The carrier

frequency after detection is used in the conventional Octaphase shift-keying detector. Also the demodulator has a simple hardware realization that does not require a reference signal.

### **Leadership Development: A Factor In Predicting Undergraduate Academic Success Of Students In A Residential Living Community**

**Louann Waldner**  
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**Oklahoma State University**  
**Presentation Subject Area: Education**

Students (N=68) participating in the **Freshman In Transition** program were studied to determine the factors most useful in predicting academic success, as measured by cumulative GPA at the end of the freshman year. With decreasing budgets, retention and academic success of students is very important to college administrators. Programs designed to improve student success must be evaluated to determine the aspects of the program most useful in predicting success. Analysis of the data indicated that high school GPA, ACT score and participation in leadership activities were factors most useful in predicting academic success. The high school GPA and ACT findings are consistent with the literature. Participation in leadership as a predictor of success is not discussed in any depth in the literature. More research on this variable as a possible predictor of success is merited.

### **Synthesis And Characterization Of A Highly Fluorinated Dhp Derivative.**

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**OSU**  
**Presentation Subject Area: Physical Sciences & Technology**

Calcium channel antagonists inhibit the flow of calcium into the cell by blockage of specific membrane channels, thus, they mimic the effect of  $\text{Ca}^{2+}$  withdrawal from the heart and hence block contraction producing decreased vasoconstriction, and a decrease in cardiac arrhythmias. These agents are clinically used for the treatment of angina, hypertension, peripheral vascular disorders and some types of cardiac arrhythmias. Of the number of families of drugs active as calcium channel antagonists, 1,4-dihydropyridine (DHP) derivatives are commonly used (Figure 1).

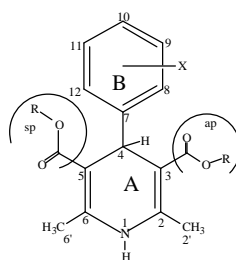
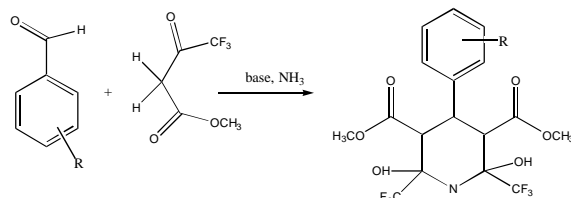


Figure 1

There have been numerous published Structure-Activity studies reporting *in vivo* activities of the known DHP derivatives. These studies lead to conclusions about the importance of positions of the substituent(s) on the B ring, to increased activity of a DHP molecule as a calcium beta blocker. In particular the presence of fluoride on that ring greatly increases the activity of the molecule.

The reaction of two moles of trifluoroacetoacetate esters with substituted benzaldehydes in methanol with ammonia and base has led to compounds with perfluoro methyl groups and hydroxy groups substituted at positions 2 and 6:



One member of this new family have been characterized by single crystal X-ray diffraction and shows high potential for hydrogen bonding at the nitrogen end of the A ring and thus high beta blocking activity.

## Perceptions Of Racial Groups By College Students In A Freshmen Level Education Course

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Presentation Subject Area: Education

Research indicates that racial and ethnic groups differ significantly regarding their perceptions of the cultural climate on campuses. Levine & Cureton in Whitt, et al., remark, 'Tension regarding diversity and difference runs high 'Multiculturalism remains the most unresolved issue on campuses today' (p 173). In view of current subtle and overt signs of racism reported on college campuses, this study is concerned with perceptions of college students toward various racial groups. Rather than attempting

to quantify student beliefs, the current research is intended to identify and qualitatively summarize self-reported perceptions that reflect student vocabulary and language backgrounds. Three questions are addressed. How do college students describe various racial groups? What racial groups are described by predominately positive descriptors? What racial groups are described by predominately negative descriptors? Information collected can be used for developing and implementing ethical and cultural events that enhance understanding and positive interaction between individuals from diverse backgrounds. FYI: Whitt, E., Edison, M., Pascarella, E., Terenzini, P. & Nora, A. (2001). Influences on students' openness to diversity and challenge in the second and third years of college. *The Journal of Higher Education*, 72, 172-204.