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2013 Oklahoma Research Day Full Program

University of Central Oklahoma

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Abstracts from the 2013 Oklahoma Research Day
Held at the University of Central Oklahoma

01. Business Administration

01. Accounting

01.01.01 The Influence of Employment Subsidies on the Hiring Decisions of American Companies

Richard Alltizer, Thomas Lewis,

University of Central Oklahoma

The purpose of this paper is to examine employment subsidies and their effect on the labor market in the United States by examining past employment subsidies and comparing them to current subsidies. Congress over the years has authorized employment subsidies for a number of reasons. Two major reasons are the advancement of social policy and job creation. Social policy is concerned with economic inequality that exists between groups in America while job creation is geared toward decreasing the unemployment rate. Employment subsidies are in theory a good policy tool to attempt to achieve both goals. In the current economic climate, it is important to assess whether subsidies are effective policy tools, or if they are being claimed by firms who do not necessarily need the subsidies. It is also important to look at the effect that these policies have on the employment prospects of disadvantaged groups. Current employment subsidies will have a minimal effect on the job market.

01.01.02 Tax Fraud: A Summary of Judicial Findings

Richard Alltizer, Kathleen Kunkle,

University of Central Oklahoma

The article looks first at the most important and prevalent codes and regulations dealing with tax fraud. The article focuses on the avoidance of tax liability as a result of failing to accurately document income and the concealment of assets as a result of improperly disposing of property evidence. It, then, discusses the history of tax fraud and evasion, beginning with the Han Dynasty in AD 25 and leading up to present day tax predicaments in the United States. Following the history, three significant cases are analyzed as examples of the enforcement of the existing codes and regulations. Finally, conclusions are drawn regarding tax fraud and the article is brought to a close by looking ahead at tax fraud prevention.
01.01.03  Retirement Saving: What You Should Know Before You Start Your Big Girl Career

Richard Alltizer, Lisa Anderson,

University of Central Oklahoma

The array of retirement options may seem overwhelming at first, but don’t let that hinder you. Educating yourself on the various retirement tools is the most important first step. By doing this, you’re already ahead of the game. Start thinking about retirement now and you’ll be thanking yourself later. There are many retirement saving options available which include: employer-based retirement plans such as defined benefit and defined contribution plans, supplemental retirement accounts such as IRA’s and social security, and personal savings in accounts such as CDs or bonds. But it doesn’t stop there, once you open these employer-based and supplemental retirement plans, you are commonly given the ability to decide where your funds are invested. Typical investment options include, but aren’t limited to: stocks, bonds, real estate, foreign investments, mutual funds, and ETFs.

01.01.04  Tax Fraud

Mary Sheets, Jamie Schmidt, Lori Smith,

University of Central Oklahoma

Millions of people fall prey, either by scams or deliberate acts, to tax fraud every year. Some of the most commonly used tax fraud tools involve using false deductions or unqualified tax credits to reduce a tax liability or receive an unjustified tax refund. In this poster we will focus on four types of tax frauds: dependency exemption fraud, earned income tax credit fraud, identity theft, and education credits fraud. First, we will define each type of tax credit and each corresponding fraud and determine who is committing those frauds. Next, we will illustrate how each fraud works and how criminals are engaging in each type of fraud. We will then discuss the potential consequences associated with frauds and the fraudsters who commit the crimes. Finally, we will discuss what the future is for the tax credits that are aiding financial rewards to fraudsters.
01.01.05  Hobby vs. Business

Mary Sheets, Eno Anwanwan, Gia Madole,
University of Central Oklahoma

Every taxpayer has a different tax situation. Some situations are simple and easy to interpret, while others are complex and could have different interpretations depending on how the situation is viewed. One issue that frequently comes up in this situation is whether an activity an individual is engaged in is a hobby or a business. When an activity is a hobby, the taxpayer can deduct expenses only up to the income generated by the activity. Whereas, when the activity is a business, the taxpayer can deduct all expenses, regardless of activity income for that year. The Tax Court has developed nine guidelines to decide if a taxpayer activity should be classified as a hobby or a business. Most activities will not pass or fail every guideline, so the court looks at the big picture to see if the activity passes or fails the guidelines overall. Taxpayers can learn what the court is looking for by viewing past cases and analyzing why the court ruled an activity as a hobby or a business.

01.01.06  Proposed Elimination of the Oklahoma State Income Tax

Mary Sheets, Jennifer Tucker,
University of Central Oklahoma

There is strong debate in Oklahoma over the elimination of the Oklahoma state income tax. In a nutshell, proponents of elimination of the state income tax, primarily Republicans, contend that elimination of the tax will result in increased spending and increased population growth, thus increasing business and economic development. Opponents of the elimination of the income tax, primarily Democrats, believe that elimination of the state income tax will result in cuts to necessary programs that benefit working class Oklahomans without a corresponding benefit of economic growth. It appears that everyone involved recognizes that the reduction or elimination of the state income tax is a complex issue that involves balancing legitimate needs of Oklahomans with developing a pro-growth economy. Working through the various proposals, it is clear that the goals are not mutually exclusive and Oklahoma, through continued compromise, can continue its current pro-growth track while funding programs that support higher education, infrastructure, public safety and other programs that also contribute to economic development.

01.01.07  America's Looming Retirement Problem

Mary Sheets, Micah Zink, Sara Zink,
University of Central Oklahoma

Personal retirement funding comes from Social Security (SSA) and savings. Since SSA is not meant to provide luxuries in retirement, Americans need to save in order to keep ongoing lifestyles. Currently, America’s savings rate is dropping and relying more on SSA to provide a higher percentage of retirement funding. This reliance on one source of funding becomes dangerous. Americans have a multitude of options when discussing ways to save for the future. Retirement accounts are the most popular way of saving. These retirement accounts are encouraged by the US government and receive special tax treatments.
01.01.08  Hierarchy of GAAP vs. IFRS--The Case of Bankruptcy Accounting

Daniel Haskin, Teresa Haskin,

University of Central Oklahoma

With increased movement toward convergence of major accounting principles between U.S. GAAP and IFRS, the issue of which authoritative source should be referenced becomes increasingly important. An important question is: what is the hierarchy of authority for pronouncements and documents under U.S. GAAP and IFRS? FASB Accounting Standards Codification is the single official source of authoritative U.S. GAAP. The hierarchy under international standards is less clear. The IASB promulgated a hierarchy in IAS 8, but interpretation concerning many issues is required. There are several issues not addressed at all by IFRS and one of these is bankruptcy accounting. ASC 852 is the guidance for bankruptcy accounting under U.S. GAAP. This study will investigate whether companies in countries which use IFRS are influenced by the guidance of ASC 852 when confronted with bankruptcy. A review of the financial statements of bankrupt companies in countries using or converting to IFRS was conducted into the reporting of reorganization-type bankruptcies. (Thanks to the UCO Office of Research and Grants for providing support for this research).

01.01.09  Critical Thinking by Advanced Accounting Students

Daniel Haskin,

University of Central Oklahoma

In the Fall of 2012, I engaged my advanced accounting students in a research project to accomplish the following objectives: 1. Define critical thinking. 2. How would critical thinking be useful to me in practicing financial accounting as a CPA in public practice or in industry or government? 3. How would critical thinking have helped prevent some recent accounting scandals such as Enron, WorldCom, and Bear Stearns? 4. How does critical thinking relate to ethics in the practice of financial accounting? This project fits with the transformative learning objective related to research, creative and scholarly activities—students are encouraged to apply critical thinking to all situations.

01.01.10  Earned Income Tax Credit: Does it Serve its Purpose?

Mary Sheets, Crystal Medell, Kelsey Thomas,

University of Central Oklahoma

The EITC has been a part of US tax credits since 1975. It has played a major role to help assist low-income households. It has had major reforms and expansions throughout the decades. It started as temporary relief and has developed into one of the largest welfare programs in history. The EITC’s main purpose is to help low-income families with financial assistance and to encourage lower income families to work. Although it has had changes to help ensure that it would be utilized efficiently, it still has its faults. It is still currently being under utilized by those in need and over utilized by taxpayers that should not receive the credit. Even though the EITC has its critics, it provides more support for a welfare program than any other agency. The main concern with the credit is if it serves its intended purpose overall.
01.01.11  ERP Consolidation Accounting Serial Exercise

Zane Swanson, Siegfried Chan,

University of Central Oklahoma

This project develops a serial exercise in consolidation accounting. Consolidation accounting is a more challenging area for accounting students. The reason is that they must understand complete financial statements of the combination of more than one entity with more than one time period involved. In contrast with most accounting learning objectives which address one journal entry at a time, the consolidation problems require multiple entries. The benefit of the exercise for students is a logical development starting with relatively simple investments in subsidiaries up through the activities of inter-affiliate transfers of inventory, noncurrent assets and financial instruments. While spreadsheets are useful for learning purposes and are the principle means of explaining consolidation accounting, the “real world” uses Enterprise Resource Planning (ERP) systems to do the accounting cycle of an investor company and its subsidiary. Therefore, an education need exists to show students how to process accounting cycle information in multiple entities and “roll up” the information into consolidated reports which have applicable consolidation elimination entries. This serial exercise is portrayed with a spreadsheet (EXCEL) and with an ERP system (Great Plains Dynamics). The ERP information is entered in journal form and then aggregated with a report writer.

01.01.12  Transforming the Graduate Business Experience,

Kathleen Kunkle, Robert Epstein, Suzanne Clinton,

University of Central Oklahoma

The ultimate goal of Transforming the Graduate Business Experience was to help students grow by allowing them to practice what they learn in class each week. The goal was realized by the process of transforming BADM 5005, Leading in the Globally Competitive Environment, through the technique of “flipping the classroom”. This is the idea that what is typically presented in class by an instructor will be received at home through videos, podcasts, and online resources. Activities normally given as homework are then completed in the classroom. Ultimately, this means more hands-on experience in the classroom. Class time will be used to reapply the knowledge that the students have already absorbed at home. For this project, my purpose was to conduct research on videos, case studies, activities, etc. to incorporate into the redesign of BADM 5005. My goal was to focus on three weeks of class, present my ideas relevant to the course material, and write learning objectives for each week. Before planning, I began by researching the flipped classroom technique at major universities, such as Harvard. This, along with my experience in BADM 5005, gave me an understanding of what type of activities would be the most beneficial to the students. Each week’s lesson plans include a video to watch, case study to read, or discussion question before coming to class. Upon arriving to class, students can expect a teamwork project, small group case study, discussion exercise, or a ty
01.01.13  Revenue Accounting in the Oil and Gas Industry

Jane Calvert, Stephen Rose,

University of Central Oklahoma

An overview of products in the oil and gas industry are discussed in this presentation. This overview also includes common acronyms and their meaning within energy industry nomenclature. Additionally, current issues such as post production cost, oil valuation and gas valuation are analyzed.

01.01.14  An Analysis of Online Learning Problems and Pitfalls in Accounting Curriculum

Jane Calvert,

University of Central Oklahoma

Distance education is quickly becoming prevalent on university campuses. This new educational platform is relatively new and learning theory and "best practices" with respect to accounting curriculum are in their infancy. There are several significant deficiencies in current online learning modalities. This presentation discusses the most important of these issues that will affect the development and management of online learning for accounting students.

01.01.15  The Fair Tax Concept

Bambi Hora, Rhodora Laughter,

University of Central Oklahoma

The income tax system was brought into existence during the twentieth century in the United States of America. Since its inception, it has grown in size and complexity and is a central concern for both businesses and individuals. Since about the turn of the twenty-first century, a group of interested parties has worked to research potential solutions and, after a good deal of research and consideration, have settled on a sort of consumption tax which would completely replace the current tax code and abolish the Internal Revenue Service. This paper will discuss the Fair Tax, as it is called, and the proponent's positions on the current tax code and the purported superiority of their suggested replacement.
01.01.16 Understanding the Buffett Rule

Bambi Hora, Jacob Reynolds,
University of Central Oklahoma

Analyzing the Buffett Rule is initially complicated because of the financially charged emotion involved for most Americans when discussing income taxes, and it is further complicated by the widespread ignorance of the tax system in general. In order to fully understand what Mr. Buffett was saying in his letter, it is necessary to understand the current tax system for individuals and business entities, the reasons why Mr. Buffett's (significant) income was taxed differently than that of his office mates, and how Congress could modify the tax law to accomplish Mr. Buffett’s goal. Once all of the facts are presented and understood, opinions can then reasonably be formulated.

01.01.17 Limited Liability Companies: Choose Your Tax Fate

Bambi Hora, Christopher Ryan,
University of Central Oklahoma

Limited liability companies are strange and wonderful things. They are hybrid entities which provide limited liability for their owners, reasonably protecting their personal assets from loss and lawsuit; their members’ ownership is divided into “units” similar to shares of stock in a corporation; and they can be taxed as a sole proprietorship, partnership, or corporation. In order to better understand the taxation of LLCs and why the owner(s’) of LLCs might or might not select a given entity’s rules under which to be taxed, we must first understand the various tax statues and regulations.

01.01.18 Online Education and Cheating

Jane Calvert,
University of Central Oklahoma

Cheating methods have evolved with the progression of online distance education. Students have found new and creative technologically based methods to cheat on assignments and tests. It is important when designing online curriculum to be aware of these obstacles and plan ahead for prevention. Educators must take a defensive mode in order to preserve the academic integrity and quality of online instruction.
The Impact of Executive Compensation on Employee Morale

Mary Teal,

University of Central Oklahoma

With the passing of time, top executive officers have received increasingly higher amounts of compensation. During 2010 alone, officers of large publicly held companies earned approximately 400 times more than that of an average worker in his or her respective industry; this amount is twenty times greater when compared to the year 1965 (Caywood, 2010). The inquiry relates to asking if this disparity has an impact on the morale of the employees that work for these particular employers. Currently, there is not much literature available in this area. The findings in this study should be useful to corporate executive compensation committees in order to inform the process of setting balanced compensation levels that will serve to retain valued executives, while eliminating the potential negative impact on employee performance or productivity that may be based on the employees’ adverse reaction to high executive compensation amounts. This balancing should occur simultaneously in the midst of maximizing the shareholder’s return. This paper proposes the use of qualitative data analysis that the writer will apply to interview data. The qualitative reporting will be based in part on metaphor analysis. Pitcher (2011) defined metaphor analysis as a systematic method of analyzing the metaphors that people use to express themselves to gain an understanding of a person’s unconscious motives and reasons for doing something or their conception of the process involved.
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01. Business Administration

02. Business

01.02.01 The Perceived Impact of Personal Finance Principles on Students Enrolled in the Two-Year Alternative Curriculum at the Academy of Contemporary Music

Rodney Applewhite, Allen Arnold, Victoria Campbell,

University of Central Oklahoma

The Academy of Contemporary Music (ACM) at the University of Central Oklahoma provides alternative curriculum for students pursuing an Associates of Applied Science in seven Contemporary Music degree programs. The mission of the ACM is to provide a "real world educational experience" for students via an intensified setting of transformative learning. The nature of the music industry includes business contracts and legally binding financial decisions. However, students at the ACM do not have an integrated Personal Finance course in the program curriculum. The purpose of this study is to identify the basic financial knowledge of the ACM's students in an effort to identify the potential need for financial literacy programming within the specific population. In addition, the artistic nature of the population may lead to emergent themes of learning patterns included in theories of multiple intelligences. The application of such theories may result in alternative educational approaches such as knowledge-sharing and peer-led projects as reflected in the transformative learning goal of the University of Central Oklahoma.

01.02.02 Oklahoma Panel Study of Entrepreneurial Dynamics

Joshua King,

University of Central Oklahoma

The Oklahoma Panel Study of Entrepreneurial Dynamics attempts to assess Oklahoma businesses and their entrepreneurs to form a better scientific understanding of the process of starting a business in Oklahoma. With the data we are collecting we hope to provide guidance for future generations of Oklahoman entrepreneurs as well as advance the field of entrepreneurial studies. Our specific study of Oklahoma is and will be based around the study and methodology conducted by the Panel Study of Entrepreneurial Dynamics, Institute for Social Research, University of Michigan in their nation-wide study. We hope to conduct a more refined study of exclusively Oklahoma businesses. Since November we have focused on collecting business data from various government agencies as a foundation for future surveys and interviews. Recently we have started creating questionnaires for a future survey of Oklahoma business entrepreneurs that we will contact using contact information received through the Oklahoma Secretary of State.
2012 Southern Cone Study Tour—Brazil

Tomas De los Santos,

University of Central Oklahoma

Today’s business students profit from participating in international experiences. The College of Business of the University of Central Oklahoma offered its second Study Tour to South America in May, 2012. The study tour focused on the two largest economies of South America: Brazil and Argentina. Brazil is the largest economy in Latin America and the 6th largest economy in the world, and it is a key commercial partner for the U.S. The poster report provides ideas for the successful design of such study tours. The Study Tour members (six business students and a college of business professor) visited a few selected firms and agencies in Rio de Janeiro and Volta Redonda and interacted with its executives to gain an appreciation of the growth of these enterprises, and their globalization and internationalization efforts. Among these firms/agencies were Petrobras, the U.S. Commercial Service in Rio de Janeiro, Banco do Brasil, Companhia Siderurgica Nacional (a large integrated steel mill in Volta Redonda, Brazil), as well as various cultural, historical, and educational sites.

2012 Southern Cone Study Tour—Argentina

Tomas De los Santos,

University of Central Oklahoma

Today’s business students profit from participating in international experiences. The College of Business of the University of Central Oklahoma offered its second Study Tour to South America in May, 2012. The study tour focused on the two largest economies of South America: Brazil and Argentina. Argentina is the third largest economy in Latin America and it is a key commercial partner for the U.S. The poster report provides ideas for the successful design of such study tours. The Study Tour members (six business students and a college of business professor) visited financial, cultural, historical, and educational sites in the Buenos Aires Province. At the Buenos Aires Stock Exchange the group interacted with one of its main executives to gain an appreciation of the financial deepening that has taken place in the country since its near financial collapse in 2001.
01.03.01 The Market Powers of Blue Cross Blue Shield

Cody Woods, 

University of Central Oklahoma

The research presented here focuses on Blue Cross Blue Shield containing market power in the health insurance industry. Blue Cross Blue Shield is a major non-profit monopoly and monopsony of health insurance across the United States. The research will show how granting non-profit status in a for profit industry will destroy the basis of competition in the health care market. Due to the federal government and supreme court granting the non-profit status and expecting a non-profit to act in a responsible way they have given rise to one of the largest non-profit insurers. By focusing on variables that may affect market share we should see that granting market power to a non-profit firm will increase their market share and destroy competition in all states.

01.03.02 An Economic Analysis of Wind Capacity

Cody Woods, Zhen Zhu, 

University of Central Oklahoma

Wind generation capacity in the U.S. has increased rapidly in more recent years. In our study, we provide an overview of the trend in wind generation capacity and the relevant discussions concerning the micro-level determination of the capacity. In addition, we provide empirical evidence at the more macro-level in order to provide a better understanding of the determinants of wind capacity. Other variables chosen in addition to the production tax credit include GDP and oil prices as GDP provides an ultimate need to power and higher oil prices motivate energy users to seek alternative energy. Our evidence strongly supports the notion that the production tax credit increased wind capacity while GDP and oil prices are the internal drive for wind energy.
01.03.03 Why not moving up while moving out?

Kuang-Chung Hsu,

University of Central Oklahoma

This paper empirically assesses the relationship between international investment and R&D activities. Although this subject has been much debated theoretically, there is little empirical research on this issue. It calls for a paper to fill this gap in the literature. This project will employ U.S. manufacturing data to investigate whether international direct investment and innovation are substitutes or complements. This study also discussed the effects of international direct investment on the workers who conduct R&D.

01.03.04 An Assessment of Teaching Economics with The Simpsons

Shiouyen Chu, Christopher Shane,

Southwestern Oklahoma State University

Innovative pedagogies, such as classroom experiments and technology supplements have been developed and employed in teaching Economics. Especially in a general education classroom, students come from a variety of disciplines and lack sufficient background knowledge of economics. Alternate teaching methods other than traditional chalk-and-talk help increase students’ attention and engage them with the lecture material. This paper aims to quantify the effectiveness of teaching Economics with the American TV show The Simpsons. We evaluate students’ understanding of economic concepts by comparing their performance in answering Simpsons-related questions on pop quizzes and exams. Our results indicate that showing The Simpsons helps students who earned a grade below C gain an advantage in answering Simpsons-related questions on the exam, especially for definition-based Macroeconomics questions.

01.03.05 Preference Reversal Phenomenon

Hung-Ju Chien,

Oklahoma State University

One of the more disconcerting violations of the rational choice theory is the preference reversal (PR) phenomenon. The PR phenomenon occurs when an individual chooses lottery A over lottery B in a choice task but then subsequently says they are willing to pay more for lottery B than they are for lottery A in a pricing task. Changing the framing of the decision from a choice task to a pricing task causes people to reverse their preferences. PRs violate the assumption of preference completeness and stability, and are thus seen as a behavioral anomaly relative to the rational choice paradigm. If changing the way people’s preferences are elicited can eliminate PRs and thus the practice rational cost-benefit analysis can be resumed. This study aims to test the robustness of the PR phenomenon and to determine the extent to which the anomaly might be resolved through changes in the way in consumer preferences are elicited in different treatments of an economic experiment.
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01. Business Administration

04. Finance

01.04.01 An Exploratory Multi-Campus Survey on Student Study Habits

Marty Ludlum, Brittany Smith, Kara Ludlum,

University of Central Oklahoma

The conventional wisdom assumes college students do not study as much as in previous generations. The current project is a preliminary examination of this assumption. In the current project, we surveyed business students (n=725) across five campuses in fall, 2009. We found disappointing results on the amount of time college students spend studying. We found significant differences between students on their study habits based on several demographic factors. We conclude by discussing the implications for further research in this area.

01.04.02 Personal Finance and the Millennial Generation: A Cooperative Collaboration

Allen Arnold, Patrick Harrel, Rodney Applewhite, Victoria Campbell,

University of Central Oklahoma

This project seeks to fill a crucial need in the discipline of teaching, in general, and for the purposes of this study, effectively teaching personal finance by establishing an innovative curriculum redesigned to actively engage the learner in a shared process of knowledge acquisition and assessment via creatively constructed learning strategies of “peer-led” learning and “re-presentation” of course objectives and assessments through creative and scholarly processes. Personal Finance is one of the largest credit-hour production courses on campus that is not a required course for any major. While housed in the College of Business, students in Personal Finance classes come from every college and major program on campus, thereby creating a dynamic inter-disciplinary classroom environment. Curriculum redesign that escapes the cult of the average and acknowledges the unique experiences and skills that the learners bring to the table will be a predictor of an increase in student engagement in the course as well as on the campus and in the community. It is necessary to modify design and delivery techniques of course content and presentation in order to ensure students' reception, retention, and application of required outcome objectives.
01.04.03 Financial Analysis and the Statement of Cash Flows

Vaidya Krishnan, Allen Arnold, R. Barry Ellis,

University of Central Oklahoma

The Financial Accounting Standards Board made the statement of cash flows (SCF) a required part of financial reporting in 1987 and since 1988 companies have included the SCF in their quarterly and annual reports. However, our review of more than fifteen textbooks in Finance and Accounting shows that financial analysis as seen in most of these textbooks is predominantly based on the income statement and the balance sheet. The SCF is typically discussed as an after-thought, if at all. Practically all the financial ratios are based on numbers drawn from either the income statement or balance sheet. The focus of the analysis is on income and assets/liabilities rather than cash flows. This paper develops an approach to financial analysis that uses the information provided by the SCF to supplement the extant financial analysis tools. The paper develops a common-size analysis framework as the starting point for the financial analysis using the SCF. We describe four different common-size models and compare the relative merits and disadvantage of these. The common-size statements are then shown as easy diagnostic tools to identify a firm's relative strengths and weaknesses. The common-size SCF can also be used to examine the quality of a firm's earnings as well its life cycle phase (growth, mature, declining, etc.) We develop a number of ratios based on components of the SCF and compare these as analytical tools against traditional financial ratios.

01.04.04 The Value of the PEG Ratio

Teri Allen,

Southwestern Oklahoma State University

Value investing has gained popularity among not only professional fund managers, but also with individual investors who have hopes of achieving a higher than normal portfolio return. Many value investors rely on the price-earnings-to-growth (PEG) ratio as one of the primary tools used to help determine if stocks meet the “value” designation. Although the ratio has become popular due to canonical literature, little academic research has been conducted to verify if PEG investing is in fact a profitable investment strategy. The PEG ratio is said to help investors estimate fair valuation by comparing a corporation’s expected growth to its price-to-earnings (P/E) ratio. It is commonly thought that a benchmark PEG of 1.0 represents a correct valuation, with lower (higher) values representing under (over)-valued stocks; however, differences based upon industry, growth rates, and cost of equity can impact this benchmark. The relationship between the PEG, its determinants, and the benchmark are discussed. A research proposal is presented utilizing historical PEG ratios as the primary selection criteria for a portfolio, then the performance of the portfolio will be evaluated and compared to the S&P 500 return over the same time period.
01.04.05 The Study of US Trade Deficit against China

Puskar Bhurtel, Sangam Magar, Zhimin Wang,

East Central University

U.S. trade deficit against China has been increasing. U.S. imports more goods and service from China than it exports. The gap has been increasing. We want to study what causes the big and increasing trade deficit for U.S. Many factors can influence trade balance, for example, exchange rate, U.S. economic growth rate relative to the economic growth rate of China, the price level in U.S., and the wage rate in China, etc. This research puts the main factors that could influence the trade between U.S. and China, and study how big the impact on U.S. trade deficit from each factor. We regress U.S. trade deficit against China on the main factors that could influence the trade deficit. The data we use in our study is quarterly data during the period 2001-2012. We collect the data from various resources, for example, US Bureau of Economic Analysis, National Bureau of Statistics of China, International Monetary Fund (IMF), etc. Our result shows that the most significant influence is from the wage rate in China, which influences the cost of goods produced in China and its competition in U.S. market, and the price level in U.S. The relative economic growth rate and the exchange rate between U.S dollar and Chinese RMB also impact the U.S. trade deficit.

01.04.06 Impact of Sustainability on Performance: Case Study

Julia Kwok, Elizabeth Rabe,

Northeastern State University

Sustainability involves three major components: ecological, economic and social aspects. Current literature on sustainability performance assessment focuses mainly on qualitative description of the extent of sustainable efforts. Majority of the quantitative analysis is in the ecological area due to government regulations. The traditional discounting method may significantly underestimate the financial impact on sustainable companies since effects of current sustainability efforts may only become apparent in the distant future. A more efficient approach to estimating the impact of sustainable practices is to review a company's operating performance. The lack of literature in the non-ecological areas is a result of limited access to company's internal operating data. This paper proposes a case study approach which allows us to examine those fore-running firms that are willing to self-disclose detailed internal operational data through CSR. The study examines impacts of sustainable practices on company's operating performance. Through detailed examination of the CSR and operating performance of those companies, we are able to identify additional reporting areas that can improve the existing CSR reporting requirement.

01.04.07 Student Learning Outcomes Assessment: An Example From a Finance Course

Julia Kwok, Ernst Bekkering,

Northeastern State University

Assessing students learning outcomes is a priority in higher education. Even though essays, work problems and case studies are better ways to assess student learning in most areas, multiple choice questions are often used because of its ease to implement and manage. The authors present an example of a course subject better assessed with functional testing (Investment course) and explain how competencies within the student learning outcomes can be assessed with baseline testing, functional assessment during the course, and embedded assessment during the final examination.
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01. Business Administration

05. Information Operations Management

01.05.01 Flipping Classrooms In Higher Education

Chris Graff, Joselina Cheng,

University of Central Oklahoma

Cyber security is a growing trend, and as such, requires new tools in order to engage learners in this field. This research focuses on finding new ways to engage students to best focus on their individual learning styles. Since the target is current collegiate students, the technology used focuses on what they currently have, or will have, available to them at the moment. The students in the study then answered questions in order to determine the effectiveness of the new teaching tools, and how they related to the learning satisfaction of the students overall. This shows us how the devices differed, and gives us insight into how comfortable students are with using new technology, instead of a traditional teaching method.

01.05.02 Student Learning Outcomes Assessment: Evaluate the Group, Not the Student

Ernst Bekkering, Julia Kwok,

Northeastern State University

University administrators are becoming more concerned about efficient allocation of resources due to budget constraints. External bodies, like accreditation reviewers, require demonstration of the effectiveness of the educational process. Student Learning Outcomes Assessment has become a major issue in education and is increasingly tied with accountability for use of resources. While higher education has not yet been forced to deal with standardized tests like in secondary education, outcomes assessment meets with other obstacles to demonstrate learning effects. Assessment has to be effective, relevant, cost-effective, and provide the ability to "close the loop." The current research proposal presents using pooling of randomly generated tests items from a larger test pool. While individual students are not tested on identical items, classes and groups are tested comparatively due to pooling of randomly assigned test items. The approach offers promise in the areas of coverage of the knowledge domain, using test methods that include baseline assessment and use of testing items other than multiple choice tests. Finally, pooling the results as presented eliminates the bias caused by low student retention.
01.05.03 Students Get Their Information From Where?

Tim Bridges,
University of Central Oklahoma

Universities are using many different media to communicate important information to students. It is hypothesized that they use the newer methods enabled by technology and that students are homogenous in their methods. But, where do students look for the information they need? Could their source depend upon the type of information they need or do they depend on just a few media to search for all their needs? This research utilized a survey to collect this information from students. The findings are varied.

01.05.04 Data mining for identifying students’ difficulties in conceptual modeling

I-Lin Huang, J. Hsu,
Langston University

Conceptual data model is a process for building data models that are essential to building a well-functioning database. Conceptual data modeling has become a critical concern both in academia and in practice because the quality of database systems is critical for wide-spread e-businesses and enterprise resource planning systems in current business environments. However, conceptual data modeling is an error prone process, especially for student database designers. Empirical studies have showed that the performance of student database designers is significantly lower than that of expert database designers. Educational data mining has been used to discover the relationships between students’ mistakes and the co-occurring content. On the basis of the results, changes in teaching approaches can be suggested. In this research, a data mining approach is proposed to assist teachers to identify students’ difficulties in conceptual data modeling. By establishing the measurements for students’ errors and potential causes, the patterns for the relationships between errors and potentials are explored.

01.05.05 Student Learning Outcomes Assessment: An Example From a Business Communications Course

Ernst Bekkering, Julia Kwok,
Northeastern State University

Student learning outcomes assessment is one of the priority areas in higher education. Much assessment activity centers round the use of multiple choice questions, because non-multiple choice assessment is difficult to implement and manage. The authors present an example of a course subject better assessed with functional testing (Business Communications IS3113) and explain how competencies within the student learning outcomes can be assessed with baseline testing, embedded assessment during the course, and functional assessment during the final examination.
The use of signatures for entering into agreements and signing contracts has significantly evolved over the centuries. In the electronic age, digital signatures have legal status but are underutilized. The authors discuss the evolution of signatures over the ages and demonstrate how digital signatures are currently used by the Northeastern State University Institutional Review Board (IRB).
01. Business Administration

01.06.01 The Demand-side Dynamics of within-industry Variation in Entrepreneurial Entry

Lalit Manral,
University of Central Oklahoma

We exploit the observed variation in demand-side structural characteristics across and within the independent geographic sub-markets of an industry to simulate spatial and temporal variation in demand-side entry conditions during the later stages of demand growth phase of an industry’s life-cycle. The variation in outward shift of demand curve – due to increase in market-size and average individual consumption – across and within the geographic sub-markets of a growing industry characterized by increasing fragmentation of demand explains the observed cross-sectional and temporal variation in rate and pattern of de novo entry. We test our hypotheses by employing a unique unbalanced panel data on market entry in the US Long-distance telecommunications services industry at the level of each independent geographical sub-market during 1990-1996. We find that the increasing fragmentation of growing demand provides opportunities for entry thereby resulting in increase in the (a) number of firms, (b) y-o-y increase in number of firms, and (c) probability of de novo entry and number of de novo entrants. These effects persist after controlling for the effect of (a) market-size, (b) the state in which the particular geographical sub-market exists, (c) the market structure and competitive intensity in that particular sub-market, and (d) the attractiveness of the market.

01.06.02 Best Practices for Not-for-Profit Thrift Shops

Trang Nguyen, Robert Epstein, Suzanne Clinton,
University of Central Oklahoma

Finding the best practices to provide profit-driven organizations with information that is critical to their development and growth is not a new venue for research. Most studies focus on developing future strategies, planning actions, and measuring performances, but there is no mention of such strategies and actions for not-for-profit (NFP) organizations. The majority of these organizations run their thrift stores in an informal manner and subsequently does not have a thorough strategy. This research draws upon mostly primary sources including articles, academic journals, and research data and statistics. Some of the concerns regarding NFP’s existing practices are poor customer service, a lack of visual merchandising, and poor management of employees with developmentally challenged.

Recommendations are made on the most efficient ways regarding management and marketing practices for NFP organizations to better themselves as “businesses” and as philanthropic organizations.
Objective of the study: In this study, when investigating temporary employees, we sought to examine the relationships between new employee development (NED) practices, role stressors, and work-related attitudes. Hypothesized Relationships: It was hypothesized that NED practices would be negatively related to role stressor variables and that role stressor variables are related to employee work-related attitudes. Found at both the client organization and temporary agency Details of the Study: Data were collected from temporary employees across the U.S.; Survey was developed using various well tested measures and sent to temporary employees. Findings: The more NED practices are used, the lower the levels of both role conflict and role ambiguity. This in turn leads to higher levels of organizational commitment and job satisfaction and, ultimately less turnover intention.
01. Business Administration

07. Marketing

01.07.01 Explaining the Role of Associative Networks in the Inoculation Process

Jeanetta Sims, Cierra Maddox, Jalea Shuff, Peggy Anderson, Sarah Neese,

University of Central Oklahoma

The purpose of this research project is to explore inoculation theory in the area of the mechanism of shifting networks and network structures to better understand how inoculation affects resistance through associative networks. Using a 2 x 2 x 2 factorial design, which incorporates specific issues, inoculation messages and counterattitudinal attacks, the study will be conducted in three research phases, including Phase 1: pre screener and initial measures; Phase 2: inoculation message and measures; and Phase 3: counterattitudinal attack and measures. The assessment of associative networks across all three research phases will take place using concept maps, in order to measure the impact of inoculation upon the network structure.

01.07.02 Exploring the Dialectical Tensions Experienced by Racioethnic Female Executive Directors of Nonprofit Organizations

Jeanetta Sims, Cierra Maddox,

University of Central Oklahoma

Using Baxter and Montgomery's (1996) relational dialectics, this investigation explores the dialectical tensions experienced by racioethnic female Executive Directors of nonprofit organizations. Through 24 personal interviews, this project will contribute to the body of organizational diversity and public administration literatures by revealing the tensions that are negotiated in the areas of career progression, financing and management, and volunteerism and marketing. This understanding will improve the future success of females interested in careers with nonprofit organizations.
01.07.03 What Social Media Expectancy Discrepancies Reveal about Prospective Employee Perceptions and Attitudes

Jeanetta Sims, Anthony Murray, Sarah Neese,

University of Central Oklahoma

This investigation explores how college students’ social media expectations influence their perceptions of prospective employers and their attitudes toward employment. Using a 2x2x2 factorial design, 240 participants are required. This project contributes to public relations and communication literatures by revealing the influence of expectations while simultaneously exploring message strategies and social media behavior. Study results will improve the future success of company communications and enhance the understanding of professional social media use among college students.

01.07.04 A Price-Based Approach to the Dialectics in African American Female Entrepreneur Experiences

Jeanetta Sims, Atoya Sims, Cierra Maddox, Jalea Shuff, Peggy Anderson, Sarah Neese,

University of Central Oklahoma

This research seeks to better understand the experiences of African American female entrepreneurs using a price-based, dialectical approach. Through 20 interviews with African American female entrepreneurs about their experiences of managing, marketing, and obtaining business financing, the costs and benefits they experienced as entrepreneurs are explored. Using grounded theory, the interviews were analyzed and four price-based dialectics emerged: (1) Changing self vs. Maintaining self, (2) Being distrustful of others vs. Being faithful and trusting in God, (3) Weak support from own ethnicity vs. Strong supportive ethnic identity, and (4) Being halted by others’ perceptions vs. Moving forward despite pre-conceived notions.

01.07.05 Exploring the Dialectical Tensions Negotiated by African American Male Entrepreneurs

Jeanetta Sims, Peggy Anderson,

University of Central Oklahoma

Using Baxter and Montgomery’s (1996) relational dialectics, this investigation explores the dialectical tensions experienced by African American male entrepreneurs from a racioethnic and gendered perspective. Through 25 personal interviews, this project aims to contribute to the body of organizational diversity literature by understanding the tensions that are negotiated in the areas of business management, business financing, and business marketing from the perspectives of minority entrepreneurs.
01.07.06 Should My Class Go Social? How can Social Media Help Improve Learning

Thanh Tran, Kanghyun Yoon,

University of Central Oklahoma

The process of learning occurs within a social context, in which interactions play an important role. These interactions represent "an important factor in student motivation, involvement and success". This project investigates how social media can be adopted to improve these interactions and enhance students’ transformative learning outcomes. The project includes three studies: In the Study One, we explore students’ attitude toward using social-media-based applications in both traditional and online class settings. Study Two identifies the potential effects of using these applications on (1) class communication, (2) information retention and material comprehension, and (3) information exploration and sharing. As part of this study, we develop the underlying theory to explain these effects along with the metrics to measure the corresponding constructs. Finally, in Study Three, we implement three social-media-based applications into our classes and investigate their effectiveness in real-world classroom settings. The theory developed here contributes to the literature on social media and education—especially that on innovative teaching/learning applications—and the findings of this project provides yet another motivation to instructors to be innovative in their quest for perfection in teaching.

01.07.07 Measuring Brand Equity in Accounting Service Industry

Kanghyun Yoon, Feng Ouyang,

University of Central Oklahoma

Given the definition of brand equity as "the set of assets and liabilities linked to a brand’s name and symbol that adds to or subtracts from the value provided by a product or service to a firm and/or that firm’s customers" (Keller 1996), marketing scholars and industry practitioners have devoted lots of their efforts on developing various types of measurement metrics for brand equity and investigating the linkages between brand equity and company performances. However, little efforts have been done in accounting service industry. As expected, the nature and aspects of brand equity, along with its measurement approach, in accounting service industry are different from those in other industries. The way of measuring the brand equity in accounting service industry should be treated differently since it—i.e., the added value endowed on services (Keller 1993)—comes from the services driven by reliable and useful accounting information. In this regard, the goal of this study is to develop an effective way of measuring brand equity (BE) which is useful in the accounting service industry after reviewing the current literature in brand equity. After we conduct our review of literature on brand equity, it is found that the aspects of our measurement metrics are unique and easily applicable to the accounting service industry.
Linking Types of Loyalty Programs to Firms' Performance

Kanghyun Yoon, Minh Ha,

University of Central Oklahoma

In recent years, customers have faced various kinds of loyalty or reward programs offered by companies in a wide range of industries such as frequently mileage programs from airline companies, cash back programs for credit-card companies, free refills at the retail coffee stores, among others. When implementing these loyalty programs, marketers have expected that the programs are supposed to be an important key to the company’s profit. However, there have been little prior empirical works studying how the loyalty programs affect company profitability. To fill this gap, the goals of this study are 1) to develop a conceptual framework which describes how the marketing efforts with loyalty programs can be led to the firm’s profitability and 2) empirically test the relationship between the behavioral outcomes of loyalty programs and the profitability as an indicator of company performance. As the key features, this study incorporates the concepts of return on investment (ROI), customer lifetime value (CLV), and consumer heterogeneity in the perspective of loyalty marketing with the ultimate goal of making any customer loyal. It is found that this study provides new insights to marketers, who are in charge of designing and implementing various types of loyalty programs, when attempting to maximize the company performance using the loyalty programs.

The Effects of Multi-Product Bundling on Consumers' Reference Price and Brand Perception

Rui Xu, Thanh Tran,

University of Central Oklahoma

Product bundling is one of the common types of promotion that marketers use to increase sales. However, it is unclear whether bundling provides a long-term profitability for the participating brands/products. For instance, consumers may have the perception of inferior quality and expect lower prices for the bundled brands/products. This project addresses the above issue by exploring the effects of product bundling on consumers’ reference price as well as perception about the brand. Accordingly, we hypothesize that product bundling may negatively affect: (1) consumers’ reference price and (2) consumers’ valuation of the participating brands; these hypotheses are then tested using experimental design. The findings of this project will help companies improve the profitability of product bundling—and marketing promotions in general—which requires a careful consideration of the trade-off between the benefits and the associated costs.
02.01.01 The Wingman Project: School-Based Communication with Grandparents

Meghan Eliason, Kerri Kearney,
Southwestern Oklahoma State University

The purpose of this study was to explore the outcomes of a monthly e-bulletin used to communicate with grandparents. Data was collected through interviews with The Wingman Project members, direct observations at the school, and artifact examination. Three major findings will be summarized in the poster presentation of this study.

02.01.02 Retention and Graduation at the 11 Public Universities with the Worst Graduation Rates, 2004-2010

Jacob Jardel, Brent Chappell,
Cameron University

Our study investigates the relationship between financial aid/cost of attendance variables and retention/graduation rates for the eleven universities in the May 2012 Fiscal Times article titled “11 Public Universities with the Worst Graduation Rate.” Our study has four working hypotheses: the tuition cost variable correlates negatively with total university graduation rates, graduation rates for males and females, and graduation rates for students of the five studied ethnicities (White, African-American, Asian-American, and Hispanic, and Native Americans) at the 11 study universities; financial aid availability will correlate positively with both the overall graduation rate and the graduation rates of the study groups mentioned above; cost of tuition will have a negative correlation with retention rates for the study universities and for Cameron University; and financial aid variables will correlate positively with retention rates for Cameron University. We collected necessary data for each of the eleven study universities and aggregated the data by ethnicity and gender to perform a correlation analysis. We chose Cameron University as a focus university and performed correlations comparing the cost of attendance/financial aid variables and retention rates. Results from the correlation analysis disproved three of our hypotheses; the only hypothesis supported with the correlation analysis was our fourth, which focused on tuition and retention at Cameron.
02.01.03 Researching and Learning from Racio-ethnic Authentic Educators with Oklahoma Ties

Ed Cunliff, Jeanetta Sims, Prasanna Prasai, Stephanie Pera, Torrie Abramo,

University of Central Oklahoma

The vision of this research project is to use life history interviews of racio-ethnic educators with Oklahoma ties to conduct basic research and to develop a YouTube video series of cases based on research results. The research project will be completed over two academic funding years. This project will begin in Year 1 by identifying racio-ethnic authentic educators, who are (1) leading and accomplished educators in their respective disciplines and (2) recognized as the “first” to achieve key accomplishments in their academic careers. Through semi-structured life history interviews, this project will explore the dialectical tensions they negotiated, their perspectives on authentic leadership, and their visions on diversity across racio-ethnic lines. In Year 2, the resulting data of interview audio and video transcripts will be used for conducting data analysis of basic research questions and for developing a YouTube video series of lessons learned that will serve as an educational resource. This project will draw from three bodies of interdisciplinary literature - relational dialectics (Baxter, 1990, 2004a, 2004b; Baxter & Montgomery, 1996), authentic leadership (Northhouse, 2010), and organizational diversity (see Sims, 2008 for a more exhaustive overview. The project uses a qualitative approach (similar to Parker, 2005) to unveiling the dialectical tensions and attributes of authentic leadership.

02.01.04 The Two Predictors of Americans' Attitudes Toward Illegal Immigration: Perceived Threat and National In-Group Identification:

Yaser Dorri, Cathy Berry, Fatemeh Sabeghi,

University of Central Oklahoma

The aim of this study is to measure the attitudes of Americans toward illegal immigration (IM) in the U.S. This study also examines the effects of perceived out-group threat (PT) and National in-group identification (NI) on attitudes toward IM. Here we hypothesize that PT and NI are positively associated with negative attitudes toward IM. We also hypothesize that PT and NI are strong predictors of Americans'attitudes toward IM in the southern states. Results of this study reveal a significant and positive correlation between PT and attitudes toward IM in the southern states of Oklahoma, Texas and Arizona. In the southern states, Texas had the strongest and significant correlation (positive) between NI and attitudes toward IM; r(PT-Attitude) = 0.721, p = 0.004, r(NI-Attitude) = 0.697, p = 0.006. However, only PT predicted negative attitudes toward IM, but very strongly; B = 0.96, t (14) = 3.6, p = 0.004, R2=0.52. The most significant and strongest correlation between PT and attitudes toward illegal immigration in the southern states was found in Arizona ( r = 0.829, p = 0.0001) and Texas had the second strongest correlation ( r = 0.721, p = 0.004). This study reveals that southern states have negative attitudes toward IM and people in these states identify themselves strongly as American (NI); M(Attitude) = 3.32, M(NI) = 3.7. These finding confirmed our hypotheses.
02.01.05 Humor as an exposure stimuli: A physiological investigation of the response to different types of humor in the socially anxious.

Chad McCoy, Bethany Barnett, Caleb Lack, Deon Hall, Jade Porter, Sean McMillan,

University of Central Oklahoma

Cognitive-behavioral therapy, in particular exposure and response prevention, is the gold-standard treatment for anxiety disorders. However, there are numerous difficulties in conducting exposures, not the least of which is obtaining the proper triggers for a person’s anxiety. This project investigates if and how persons with high social anxiety and a control group differ in their physiological reactivity to three different forms of video humor and a non-arousing control. This is being done to determine the usefulness of humorous stimuli in exposure therapy. Initial pilot results on a small sample of subjects is promising. While no baseline differences are being seen between groups on the control video, higher galvanic skin response and heart rate is seen in the socially anxious group. The two groups appear to have some differences based on the examination of means. This is particularly evidence in the GSR across all videos, where the non-anxious scores are twice the size of the anxious. There are also apparently large differences in the HR. Due to the small sample size our power appeared to be too low to detect such differences in an ANOVA, as the only statistically significant difference between the groups was seen on the heart rate in response to the “gross-out” video. Despite the low numbers, the initial study warrants further investigation with on-going data collection to determine the possibility of humorous videos for treatment of anxiety.

02.01.06 Transforming for the Sake of Transformative Learning Through HIP Programs

Ed Cunliff, Jeff King,

University of Central Oklahoma

At the theoretical level Transformative Learning is clear, and at the practical level many would say, “We know it when we see it.” What the University of Central Oklahoma has done with Transformative Learning is to operationalize it through the use of six High Impact Programs (Kuh, 2008) that at Central are called “The Central Six.” This operationalization has allowed faculty and staff to understand and implement the process and to impact the university culture of learning and teaching. Can any of our successes and failures inform your campus’ transformative learning initiatives? We’ll freely share our triumphs and our ongoing challenges!
02.01.07 Custodial Grandparents and Emotional Well-Being: The Lingering Effects of Reassumining the Parenting Role

Braden Cary, Yungfei Kao,

*Northeastern State University*

The study explores a need in counselor education on addressing custodial grandparenting as part of a lifespan development curriculum. The aging world has given rise to a growth in custodial parenting. The 2010 census reports close to 5.4 million children living under a household headed by a grandparent. As these grandparents become more involved as parents, data shows for the grandparent: higher depression, insomnia, and less time spent focusing on their own issues. Grandparents seeking assistance with their emotional distress learn to offset the negatives with the happiness with the grandchild and a sense of purpose. The current study sought to understand the perceptions from counselors-in-training. Grandparents assume the role of parent out of various reasons: death of parent, financial hardship, incarceration of a parent, military deployment, or abusive household. Each reason comes with their own difficulties that direct their treatment. In addition, these reasons may cause biases within counselors. By presenting counselors-in-training vignettes of a grandmother seeking therapy for her and her granddaughter, the research sought to disseminate between those who view an intake of a grandparent who has assumed parenting from the death of her daughter compared with those viewing a grandparent who has assumed due to incarceration of her daughter. Specifically, comparisons are made on the perceptions of ability to parent alongside perceived affect.

02.01.08 Perceptions of Collegiate Student Athletes and Brain Injury

Chas Riden, M.Ed., Gary Howard, Malinda Green, Mark Maddy,

*University of Central Oklahoma*

Traumatic brain injury (TBI) is an evolving deleterious problem in contact sports like football. Helmets do not retard impacts beyond 14 g-load. The action of external and internal forces on the body disrupts homeostasis. When the human brain is exposed to physical blunt force trauma, as is the case with concussion, biomechanical forces inside the cranium called acceleration and deceleration forces are activated. The brain shifts internally at the subdural level. Football players generally receive impacts to the prefrontal lobe or cerebellum. Acceleration and deceleration forces slam the delicate, gelatinous brain against the internal walls of the skull causing TBI to occur. TBI injuries like secondary impact syndrome (SIS) can be deadly. TBI interrupts and impairs cognition. The subjects in this study were current University of Central Oklahoma student athletes who participated in varsity football during the spring 2012 semester. A five-point Likert type scale of thirty-two items was administered to thirty (30) athletes who played on offense, defense, and special teams. The study focused on describing the frequency and severity of concussion among UCO football players and the perceived relationship to cognitive processing and awareness of concussion protocol. The study found that, although 37% of the total sample reported a concussion, the occurrence had caused minimal difficulties with cognitive ability.
02.01.09 Subliminally Primed Social Exclusion's Effect on Reaffiliation Behaviors

Erin McReynolds, Robert Mather,

University of Central Oklahoma

The need to belong is as innate as our need for food or water (Maslow, 1943). When that need is threatened, people strive to reaffiliate with desired ingroups. They may act in uncharacteristic ways, or purchase items they would not normally purchase to appear more like the desired ingroup. Belongingness and loneliness are related, such that feeling excluded may increase the likelihood of loneliness (Mellor, Stokes, Firth, Hayashi, & Cummins, 2008). In the present study, participants will be subliminally primed with stimuli pilot-tested for social exclusion. The purpose of this research is to determine if subliminally-primed social exclusion affects participants' reaffiliation efforts with an ingroup. Participants were prescreened for their hometowns, either Oklahoma City/Edmond or Tulsa, and then watched a slideshow with 29 pictures of Oklahoma City and Tulsa landmarks, including filler images from other cities. Experimental condition participants viewed another slideshow subliminally priming social exclusion with either pictures or words. Finally, participants were told that they had $300 in fake money to donate to fictional charities based in Oklahoma City or Tulsa. The dependent variables will be number of charities from each city donated to and amount of money donated to charities from each city. The researcher predicts that participants subliminally primed with social exclusion will donate more money to charities based out of their hometown compared to controls.

02.01.10 The Role of Culture in Vocabulary Consolidation Strategies used by English Language Learners (ELLs)

Banu Bilen,

University of Central Oklahoma

Learning a second language requires the effective use of vocabulary. Using effective strategies to retain a new word is as important as learning a new word. According to released data for the Test of English as a Foreign Language (TOEFL), (ETS, 2010) there is achievement difference in the TOEFL between two cultures: Arabian and Korean. This research investigates the effect of the culture on applying the consolidation strategies of learning a word after discovering its meaning through comparing consolidation strategies of these two cultures. To see the different vocabulary consolidation strategies between S. Arabia and Korean English learners, twenty-five ELLs from each culture were selected randomly for questionnaire from UCO and ELC (English Language Center). From these questionnaires, eight volunteer ELLs were selected to participate in a follow-up interview: four S. Arabians, and four Korean learners. The results showed there are not so many differences between the two cultures’ consolidation strategies. Koreans prefer to use the word in sentences in their writings and while communicating, while S. Arabians use repetition through writing the new word or saying it aloud and use multimedia to refresh their vocabulary. The findings of this study will give insight into how language learners enhance their vocabulary retention through consolidation strategies.
Can access to school transparency expenditure data required by SB1633 of the 2010 Oklahoma Legislature reveal statistically significant relationships between school expenditures and student outcomes?

Howard Kuchta, Kelly McClure,
Cameron University

The School District Transparency Act (SB1633) of the 2010 Legislature requires the posting of each Oklahoma school site and school district annual expenditure data. This made individual school-site expenditure practices accessible for the first time. The research question posed was: Can access to school transparency expenditure data, required to be published by SB1633 of the 2010 Oklahoma Legislature, reveal statistically significant relationships between reported variables, particularly student academic outcomes? The focus for this project was the 2010-11 school site transparency expenditure data. A manageable sample of the 1,785 schools in Oklahoma was derived from a National Center for Education Statistics online search. Sampling was done to reduce the scope of the project to 45 ES (PreK-5), 45 MS (6-8), 45 HS (9-12) public schools resulting in 124 state-wide schools in the sample. The question centered on whether statistically significant correlations between local school discrete expenditure data items and related instructional variables could be established that would inform educational spending practices within local schools and districts? The results show significant relationships such that the expenditure data available under the School District Transparency requirement can and should be utilized to draw associations about instructional spending practices and their relationship to student performance and other instructionally-related variables.

Conversing On A Mobile Phone versus In-Person: The Impact of Reduced Attention On Flicker Change Detection Paradigm

Cindy Chia,
University of South Australia

The prevalence of road accident cases has called for researchers’ growing attention in the last decade. 275 students (56 male and 216 female) from University of South Australia participated in a Change Detection activity via CogLab software to empirically investigate the impact of conversing on a mobile phone versus conversing in person on the ability to detect change in flicker paradigm. As anticipated, reaction time is found to be related to flicker paradigm and that participants in the control condition group has the fastest reaction time, followed by the conversation group and then the mobile group. While attention is the most crucial role in bringing observers into awareness and consciousness, it is foremost important aspect in a change detection task. These findings relate to traffic environment where multitasking while driving disperses observer’s attention and may lead to unintentional carelessness affecting effective scan on visual scenes.
02.01.13 Expectations and Motivations of Alternatively Certified Teachers

Erin Fullenwider, Mike Nelson,

University of Central Oklahoma

The goal of this phenomenological study is to identify and describe the motivations and expectations of pre-service teachers who are (or are going to be) alternatively certified. While there is little doubt that individuals choose teaching as a career with the intent of helping children and adolescents, it is less clear what other motives alternatively certified teachers might have for becoming a teacher. An initial questionnaire was given to 29 graduate students in their first semester of course work in the Secondary Education Program. The questionnaire included questions regarding (1) general demographic information, (2) information on work experience, teacher certification, school sites, and (3) and reasons for becoming a teacher. Four students were then selected for focus interviews. The participants were selected to represent the diversity of characteristics and perspectives within the survey group. The interviewees answered questions regarding: (1) motivations for wanting to be a teacher, (2) personal goals for teaching, (3) beliefs about the roles and responsibilities of teachers, (4) expectations regarding what he/she can accomplish as a teacher, (5) expectations regarding the impact he/she expects to have on students, and (6) perceptions of what it will take to work effectively with adolescents. Interviews were transcribed and analyzed to identify common themes. Preliminary findings will be presented.

02.01.14 Who Graduates High School in Oklahoma?

Sara Trivari, Katherine Heitner,

Cameron University

In 2011, an article in the Tulsa World newspaper ranked the state of Oklahoma 34th in the United States for high school graduation rates (Eger 2011). The purpose of this study is to investigate Oklahoma’s high school graduation rates by county and ethnic group. In an examination of Oklahoma’s 77 counties, we found that diploma attainment varied by ethnicity with Whites and African Americans having the highest levels of achievement. Moreover, the study found that diploma attainment was higher in counties near urban areas than in rural areas.

02.01.15 Social Categorization and the Cross-Race Effect: A Dual Process Exploration

Sarah Dailey, Curt Carlson,

Cameron University

The current study tested the categorization-individuation model of the CRE, and compared estimates of recollection for same-race (SR) and other-race (OR) faces. If automatic categorization of faces reduces the encoding of individuating information, then manipulating the in-group/out-group (IG/OG) status of SR and OR faces should affect both recognition and recall. The IG/OG manipulation was achieved by displaying faces in front of either classroom (IG) or prison/jail cells (OG). Each face was also paired with a name, in order to uniformly encourage individuation of the faces, as well as provide us with a richer measure of recollection at retrieval than that used by Marcon et al. (2009). We hypothesized that an interaction would occur, reflecting both a recognition advantage and greater recollection of individuating information for SR, IG faces. These effects were found, but only for white participants.
Comparing Student Satisfaction between Online and Blended (Hybrid) Courses

Deborah Hyde, Lawrence Wybrant,

Northeastern State University

The goal of this research was to determine the attitudes of students taking an online physical geology course which was presented completely online including laboratory experiences conducted at home and comparing it with students taking a blended physical geology course which was presented partially online with a portion of the instruction conducted in a traditional classroom setting allowing student and teacher interaction to increase concept knowledge reinforcement. Informal data derived from former students suggested that students would be more satisfied with a blended presentation method which allows for face-to-face laboratory experiences and student interaction. To test this hypothesis, students from an online control group were given instruction completely online and compared with an experimental group which consisted of a blended class. Identical survey instruments were administered to both groups of students one week before final exams asking them to gauge their overall satisfaction with the course they had taken. The survey instrument was a Likert style survey which included ten statements for which students were asked to choose one of five levels of agreement. An overall satisfaction quotient was calculated and the results suggested that students preferred the blended presentation mode in 9 of 10 categories. The aggregate satisfaction quotient was calculated to +12.25 % in favor of instruction using the blended online Physical Geology method of instruction.

The Student Support Services (SSS) Project

Evan Hartwell, Patrick Harrell,

University of Central Oklahoma

Student Support Services is a federally-funded grant program designed to provide assistance to students who are low-income, first generation college students, and/or students with a disability. There is a demonstrated need for programs in higher education that specifically support individuals who belong to the previously stated categories. The American Council on Education has listed several challenges that low-income adult students face: managing the demands of work, family life, education, and social schedules; financing the costs of higher education; receiving adequate academic advising and counseling; and regulating self-esteem issues. Low–income students are less likely to graduate than “traditional” students. There is a strong correlation between parental education rates and poverty levels. Students whose parents have not completed a bachelor’s degree are more likely to live in poverty. If a student has not received adequate preparation socially, personally, and culturally for success in higher education, the student will not adjust as readily to the academic and social structures of the college community.
02.01.18 Chickasaw Nation: Analysis of Participation in Tribal Government

Daniel Tollett, Adrian John, Brian Sanders, Monty Stick,

East Central University

The purpose of this research is to survey and gather information to why voter turnout and participation in tribal meetings of the Chickasaw Nation is low. The method of information gathering is going to be a simple survey that will be sent to Chickasaw citizens. The data that we receive with this will help us in determining why participation in tribal government is low and with the help of the Chickasaw Nation we hope to bring light on this subject and to bring about any policy change that would help involve the people in their government. We will present our findings to the legislative body of the Chickasaw Nation for analysis.

02.01.19 Building a Communications Framework in the Age of Social Media

Kelly McClure,

Cameron University

Social Media applications are being recognized as useful teaching tools in the area of education. However the promise of social media communication with our students and the practical use of social media tools in the classroom is problematic. What tools to use and which of the many social media platforms are appropriate for the content matter? This initial study looks at social media tools in the framework of classroom and content communication. The study began with review of research based examples of social media use in the classroom. Information was then solicited from current local teachers for examples of how they are using social media in their own classrooms. The sample was small and consisted of current teachers from just three different schools systems, however the results showed surprising variation of social media use. The results were plotted on map-type diagrams to show relationships among various uses of social media. The end result is an initial framework for using social media platforms in the classroom as content delivery devices and as student communications tools. While this was a small anecdotal based review of social media for teaching and communication, the implications of using social media in the classroom as a teaching tool invite further study.
Perceptions of Preparedness of Alternatively Certified Teachers

Kimberly Van Aken, Mike Nelson,

University of Central Oklahoma

Abstract According to The National Commission on Mathematics and Science, thirty percent of new teachers leave the field after three years (as cited in Cavello, Ferreira, & Robers, 2005, p. 363). Due to high teacher turnover urban school districts must continually spend scarce resources on the recruitment and preparation of new teachers, many of which will leave the district or profession within 3 years (Costigan, 2004; Heineke, Carter, Desimone, & Cameron, 2010). Developing a better understanding of the teachers’ perception of their level of preparation in schools is needed, as feeling prepared is a likely contributor to teacher attrition. In depth interviews will be conducted with a sample of up to 10 alternatively certified teachers currently teaching in Oklahoma urban schools and attending the Secondary Education master’s program. The interview will ask participants about their level of preparation for teaching in urban schools. The following areas will be investigated: (1) classroom management, (2) knowledge of content area, (3) strategies for teaching adolescents, (4) designing lessons, (6) assessing students, (7) teaching culturally and ethnically diverse students, and (8) differentiating instruction.

Transformational Learning Behaviors

Hailey Hinkle, Lois Bryan, Thomas Hancock,

University of Central Oklahoma

The University of Central Oklahoma is one of the nation’s leaders in the area of transformational learning. The power of this approach can be seen in the recent work by Selcer, Goodman, and Decker (2012), who have shown that business and healthcare’s leaders have higher leadership qualities when they go above the basic skills and are instead required to think creatively. This study’s objective is to attempt to define TL by identifying a range of specific examples depicting transformational learning (TL) experiences. Instead of directly asking UCO’s students, faculty, staff, and alumni to outright define the abstract concept of TL, we will be collecting information on specific concrete experiences they believe exemplify TL. It is with great hope that this research will be able to provide specific experiences/procedures that the UCO population felt improved the educational process. In the present study, the researchers have compiled a list of examples/behaviors that highlight or characterize transformational learning here at UCO. The study was voluntary and conducted in the form of a survey disseminated through the UCO email system to current UCO students, UCO alumni, and UCO employees (administration, staff, and faculty).
02.01.22 Difference in GPA with Major and Type of Sport in Division II Student Athletes

Chelsea Smith,

University of Central Oklahoma

It has been suggested that the demand of competitive athletics in college can be detrimental to the academic success of a student athlete. Furthermore major selection may be dependent on the path of least resistance and lead to academic clustering within specific majors. The purpose of this study is to determine how student athlete’s sport and major effect their grade point average (GPA) at the University of Central Oklahoma. There has yet to be a study relating individual sports team’s division of majors and their academic success. This study used unidentified academic data from fall 2005 to fall 2012 of the University of Central Oklahoma student athletes. This study included 743 student athletes from seven major sports and represented all eight colleges at the university. The athlete’s GPA was compared to their team and major. There was a significant difference in GPA by team, GPA by major, and GPA by team by major. As a group, academic clustering was found in student athletes. The majority of student athletes had majors in the colleges of education, liberal arts, business or were undeclared. With these results the research aims to create recommendations for academic success to specific teams and majors.

02.01.23 Assessment of Transformative Learning Principles in Undergraduate Fitness Assessment Class

Chelsea Smith, Greg Farnell,

University of Central Oklahoma

Transformative learning (TL) is a teaching model that in the recent years has been applied to many universities to allow for a greater educational experience for students. The TL concept is placing the student at the center of their own learning by participating and engaging in their acquisition of knowledge. This research project seeks to describe the effects of all six TL pillars of the University of Central Oklahoma into one class. The six pillars are health and wellness; scholarly activities; global competency; service/civic engagement; leadership; and discipline knowledge. TL as they relate to each of the six pillars will be addressed in an undergraduate kinesiology class through systematic testing, including leadership inventories, discipline quizzes and group work on a specific topic. The students will be in a counterbalanced experimental design and tested at the completion of each topic. The data will be collected by word theme software from the group paper and scores on inventories and discipline quizzes. The researchers hypothesize incorporation of all six principles will lead to a different word theme pattern and higher scores on the quizzes and inventories.
Abstracts from the 2013 Oklahoma Research Day
Held at the University of Central Oklahoma

02. Education and Professional Studies

02. Family Science

02.02.01 How Play Affects the Brain!

Jennifer Turner,
University of Central Oklahoma

The brain is the most complex organ in the human body. It is comprised of over 100 billion neurons which generate mechanisms that stimulate the brain development through play. What functions of the brain does Play affect and why is it an integral part of the process of growth? Throughout this presentation we will discover the early Play Theorists Philosophies' and how they can be incorporated in brain development.

02.02.02 Factors That Deter Young Adults From Pursuing Higher Education

Maria Perry, Lori Beasley,
University of Central Oklahoma

The underrepresented groups that continue to rise in immediate college enrollment are minorities; disproportionately that of Hispanic and Black high school students. The researcher conducted voice recorded interviews in a Midwestern state with eight Inner-City high school graduates, ages 18 - 25 who chose to enter the work force or the military instead of immediate college enrollment. All participants were asked 12 questions pertaining to their high school experience, the level of college preparedness they received from educators and family members, and their views on the importance they placed on pursuing higher education for them specifically. This study yields valuable information on the thought process, opinions and perspectives behind participant's decision on higher education. The qualitative study examined the relationship between minimal to no college preparedness from schools, as well as minimal to no involvement from parents and the negative lasting affects it had on this predominantly lower socio-economic status (SES) study sample. Results showed that the lack of socialization that these participants received during their high school years from family and educators had a definite and discouraging correlation between immediate enrollment and circumventing college. In conclusion, this study highly indicated a need for more college preparedness and intervention with disadvantage students at the high school level.
02.02.03  Matching Service Learning Opportunities to Diverse Student Populations

Glee Bertram,  

University of Central Oklahoma

Service-learning is identified as an effective way to help students understand aging adults. One of my main goals as an instructor is to help students see older adults as people much like themselves with possibly a few more challenges. Once students realize this, they are much more willing to explore this area of development and how the aging process works. My students are very diverse. Some are traditional students but the majority have families, work, and carry a full course load. Also, most are commuter students ranging in age from 18 to 74. We also have many international students and an ethnically diverse population. Our university is near the metro and attracts many single parents who are receiving financial aid trying to improve their lifestyle for them and their child/children. Because of this diversity, the service-learning opportunities need to be done in a variety of ways. The purpose of this study was to compare methods of facilitating service learning projects and how to meet the needs of diverse student populations. Methods included open-ended interviews with older adults and reflection papers provided as part of student assessment for class work. Students preferred having options in when and where to fulfill their service learning hours to best fit their schedules and interests.

02.02.04  Communication Perceptions Related to Life-Threatening Illness in a Relationship: A Q Methodology Study

Jeanetta Sims, Jalea Shuff,  

University of Central Oklahoma

This study examines the prevailing viewpoints related to participants' perceptions of how communication would unfold if their relational partner was diagnosed with a severe, life-threatening illness. Using Q methodology, 59 participants performed Q Sorts, which were then analyzed using PQ Method. Principle components analysis yielded three factors on which 42 of the sorts loaded and 56% of the variance was explained. The three factors distilled from Q Sorts were interpreted as Factor 1: Communicative and Inclusive; Factor 2: Secretive and Withholding; and Factor 3: Communicative and Exclusive. Each of the three prevailing viewpoints offers insights on how participants expect to communicate if their relational partner is diagnosed with a severe life-threatening illness. Implications for marriage and family counseling are discussed.
02.02.05  Epigenetic Analysis Quantifying Behavior Health Medical Services of Oklahoma

Summer Loveless,

University of Central Oklahoma

The purpose of this investigation is to identify the overall economic impact of behavioral, mental, and medical health services (specifically those provided by Licensed Marriage and Family Therapists LMFTs), Licensed Professional Counselors (LPCs), and Licensed Alcohol and Drug Counselors (LADCs) in the state of Oklahoma. Behavioral health medical services can encompass education, addiction, injury rehabilitation, stroke recovery and mental health. Evidence shows that behavioral health medical services increase academic performance, public safety, individual wellness and family strengths for the identified patient. The services provided by a LMFT encompass the treatment of the family as a unit in conjunction with the identified patient. LPCs and LADCS typically focus on the treatment of the individual, often leaving genetic propensities and relational influences unaddressed. To treat the individual is to prevent or protect the specific individual from further psychological, physical and or cognitive damage. However, without a familial/systemic treatment approach psychosocial and psycho pathologies continuums can be maintained as they are transmitted through family relationships. If these factors are not carefully assessed, important information can be missed with potentially heavy implications for treatment success. This investigation explores the current state of mental health treatment in Oklahoma and identifies economic implications of ignoring a more systemic approach.

02.02.06  Group Differences in Relationship Education Programming Preferences

Holly Shockley, Brandon Burr, Jalea Shuff,

University of Central Oklahoma

Couple relationship education (CRE) is generally a preventative measure designed to teach relationship skills to couples and individuals. Although CRE has been active for many years, very little is known about public opinion of CRE services, and recruitment challenges to CRE programs persist. Current literature on best practices in CRE emphasizes the importance of tailoring program content, as well as program advertising and marketing efforts to fit with the needs and desires of the target audience. Some research suggests that individual and demographic characteristics may influence attitudes about attending CRE. Thus, investigating marketing and advertising techniques designed for specific audiences may lead to enhanced practice and increased program attendance. The objective of this study was to examine attitudinal differences in potential CRE program titles, venue preference, and disagreement in attending patterns in men vs. women, married vs. unmarried, highly religious vs. non-religious, and lower-income vs. higher income in a sample of 198 individuals. A series of T-tests were used to detect significant differences by group using SPSS version 18.0. The main study hypothesis was that significant differences would be detected by group. Results showed some differences were detected by gender, religiosity, and marital status. No differences were detected by income level. Discussion will be provided for those who work with couples and families based on study results.
02.03.01 Exploring the Relationship between Trunk Adiposity and Trunk Flexibility

TaNiqua Ward, Melissa Powers,

University of Central Oklahoma

Purpose: The purpose of this study is to examine the relationship between trunk adiposity and trunk flexibility among adults. Methods: A total of 29 participants, male (n=11) and female (n=18) participants between the ages of 19 and 84 years. The participants were recruited from the University of Central Oklahoma daily email news service. The bioelectrical impedance analyzer (BIA) was used to calculate percent body fat and body mass index (BMI). Three circumference measurements were taken on each participant: waist, abdomen, and hips. The two inclinometers were placed on the sacroiliac joint (S1) and thoracic 12 (T12) to measure trunk flexion and extension. Trunk flexibility was measured as the difference between the two readings at full flexion or extension. Results: The Pearson’s Product Moment Correlation was used to analyze the results. There was a significant negative relationship between trunk flexion correlated with abdomen circumference (r = -.49, p = .01) and hip circumference (r = -.39, p = .03). A significant relationship was found between trunk extension and BMI (r = .38, p = .04). Conclusion: Abdomen and hips are most beneficial when measuring circumferences for trunk adiposity. It was found that trunk flexion has a greater relationship with trunk adiposity than trunk extension.
Nintendo® Wii Fit™ Balance and Cognitive Function in Older Adults
Kristin Bogda, University of Central Oklahoma, Edmond, OK.

Fear of falling is highly prevalent among older adults. It is important to find ways to decrease the fear of falling and improve the confidence one has in their own balance when doing daily activities. PURPOSE: The purpose of this study was to evaluate the effects of a balance training intervention using the Nintendo Wii Fit on balance confidence and cognitive function, specifically executive function, in older adults. METHODS: Twelve adults over the age of 65 years were assigned to a treatment group or control group to complete an eight-week balance training intervention. Balance confidence was measured using the Activities-Specific Balance Confidence Scale. Cognitive function was evaluated with the Trail Making Test (TMT), Part A and Part B. Center of mass was measured using the Nintendo Wii Fit balance board. All assessments were taken at baseline and after eight weeks of training. The data were analyzed using an ANOVA with repeated measures for each outcome (α = .025). RESULTS: No significant interaction or time effects were observed for any variable. The group effect for TMT Part A approached significance (F = 7.034, p = 0.029). CONCLUSIONS: It can be concluded that using the Nintendo Wii Fit as a balance training tool will not improve balance confidence or cognitive function, particularly executive function, in older adults. Future studies should look at testing other components of cognitive function to see if the Nintendo Wii Fit is a useful device for older adults.

Effects of Yoga on Balance Confidence
Kelsey Hubble, Ed Cunliff, Jacilyn Olson, Melissa Powers, University of Central Oklahoma

Purpose: The purpose of this study was to determine if the combination of yoga, Tai Chi, and mindful meditation increased balance and balance confidence in older female adults. Methods: Ten female participants were randomly assigned to one of two groups: Experimental or Control. The Experimental Group received yoga, Tai Chi, and a guided mindful meditation, while the control group received Tai Chi and yoga. Both groups met for 30 minutes per session, twice a week for seven weeks. Balance was assessed with Timed Tandem Walk, Timed Tandem Stand, and Timed Up-and-Go; balance confidence was assessed with the Activities-Specific Balance Confidence scale. All assessments took place at baseline and post-intervention. A 2 X 2 ANOVA with repeated measures was conducted for all variables. Descriptive statistics and effect sizes were calculated. Results: The Timed Tandem Walk Errors group by time interaction was significant with F of 6.639 (p = .037). The control group had a large effect size of -1.79. No significant differences from pre-test to post-test were found in the Timed Tandem Walk, Timed Tandem Stand, and Activities-specific Balance Confidence scale (p > .05). Discussion: The control group had an increase in errors during the balance assessment of Timed Tandem Walk. Future research should include a longer intervention of at least 12 weeks in duration.
Effects of Active Video Games (Wii Fit™) on Senior Adult Balance, Fitness and Mood

Darla Fent, Caitlin Little, Cynthia Murray, Jacob Todd, Kayla Garver,

University of Central Oklahoma

The aim of this pilot study was to assess and compare balance, balance confidence, fitness levels, and mood in six senior adults (approximately 74 years old) recruited from a local retirement center. Two participants were assigned to one of three groups: a traditional balance class, a Wii Fit™ balance program and a control group who refrained from participating in additional daily physical activity. The seniors in the two balance classes participated in 35 minutes of activity consisting of 20 minutes of strength training exercises and 15 minutes of balance exercises twice a week for 6 months. Pre, mid and post assessments were conducted utilizing components of the Senior Fitness Test (chair stand, arm curl, chair sit-and-reach, back scratch and 8-ft. up-and-go) and grip strength to evaluate functional performance measures. Similarly, balance was evaluated utilizing the Berg Balance Scale and the Activities-specific Balance Confidence (ABC) Scale. And, mood was assessed via the Positive and Negative Affect Schedule (PANAS). Differences between pre, mid and post measurements, as well as differences between groups, were analyzed using analysis of variance (SAS) and effect size. There were very few instances in which significant differences (p<.05) occurred. However, the majority of comparisons indicated a large effect (η²p > .14). These findings imply that future studies with larger sample sizes may result in clarification of how Wii Fit™ impacts seniors' balance.

Reproducibility and reliability of optic nerve head measurements in normal eyes evaluated by Cirrus HD-OCT

Megan Kirkpatrick, Jessica Colpitt,

Northeastern State University

Introduction. Optic nerve head (ONH) assessment is a crucial element in the glaucoma clinical examination. Methods. Forty-eight subjects between ages of 22 and 36 with normal ONH participated in this study. All scans were acquired using the Cirrus HD-OCT with the Optic Disc Cube 200x200 scan on the subject’s right eye. The mean and variance from the mean amongst the three visits was analyzed using methods developed by Bland and Altman. Results. All ICCs were excellent, ranging from 0.829 to 0.98 for inter-visit measurements. All parameters showed small CR values. Conclusion. Intervisit measurements of RNFL and ONH parameters obtained with the Cirrus HD-OCT were found to have excellent reproducibility, indicating that this instrument may be useful in assessment and management of glaucoma progression. The CR values for these five parameters give us a more standardized way of measuring glaucoma progression.
02.03.06  Repeatability of Free Form Customization Measurement Technology

Randolph Fincher, Alan McKee, Jason Koschmeder,

Northeastern State University

Purpose: New free-form customized measurement progressive add lens (PAL) technologies such as the Zeiss i.Terminal are designed to measure pupillary distance, pantoscopic tilt, vertex distance, frame wrap, and fitting height far more precisely than conventional handheld instruments. To our knowledge there has been no published report on the inter- and intra-observer repeatability of the ophthalmic measurements taken with the Zeiss i.Terminal and requires additional research. Methods: In a randomized clinical study, repeated measurements were taken using the Zeiss i.Terminal to determine inter- and intra-observer repeatability of pupillary distance, pantoscopic tilt, vertex distance, panoramic angle, and fitting height measurements. Two statistical methods, Bland-Altman (mean difference) and coefficient of repeatability (CR), coefficient of variation (CVw), and intra-class correlation coefficient (ICC) plot comparisons of each different measurement were used to analyze the repeatability of each of the above parameters. Results: Inter- and intra-observer repeatability were greatest for total pupillary distance and wrap angle. Monocular pupillary distance measurements were highly variable, while fitting height, vertex distance, and pantoscopic angle had poor repeatability. Conclusion: Additional research associated to the inter- and intra-observer repeatability of parameters by this and other digital centration devices is warranted.

02.03.07  An Investigation of the Food Environment in Carter County

Kevin Fink, Christi Schultz, Deana Hildebrand, Jonathan Yuhas, Mendy Spohn, Nancy Betts,

Oklahoma State University

Oklahoma recently ranked as the fifth most obese state in the United States. Two-thirds of Oklahoma adults are classified as overweight or obese. Closer proximity to grocery stores and supermarkets encourages healthy eating behaviors and obesity prevention while convenience stores and other smaller venues are not associated with healthy eating and obesity prevention. The purpose of the study was to examine the food environment for food outlets in Carter County, Oklahoma. To assess the environment, the Nutrition Environment Measurement Survey in Stores (NEMS-S) was utilized to examine the availability, price, and quality of healthy versus regular food options. Higher scores represented a more healthy overall food environment while lower scores indicated an unhealthy food environment (-9 to 57). Utilizing ArcGIS, locations and food outlets were mapped. The overall assessments were low within the county. The mean county score was 9.14. The highest rated store assessment was 42. Overall, grocery stores provided a higher mean subscale score for availability of healthy food items than the other store-types examined. Grocery stores also provided a statistically significant healthier food environment for the overall NEMS-S and availability scores. More convenience stores were available than grocery stores within the county.
02.03.08  Entering the Flow of Labyrinth Research

Dr. C. Diane Rudebock, Katja Marquart, Kay Sandor, Lea Goode-Harris, Marion Dabney,

*University of Central Oklahoma*

This poster describes various research projects focused on labyrinth research by members of an international organization, The Labyrinth Society. This group of researchers from across the United States shared their diverse research projects using the labyrinth, a circuitous, universal path designed as a walking mediation. The new field of labyrinth research provides many opportunities to collaborate with professionals across disciplines as well as those in the United States and across the world. Electronic media allows ‘real time’ conversations to occur which in years past may have taken countless weeks and months, thus making collaboration across disciplines and locations much easier. Quantitative and Qualitative examples of labyrinth research are used to demonstrate the labyrinth as a tool which can be used across disciplines for research opportunities in various disciplines involving students, staff and faculty on college campuses and in the community.

02.03.09  Effects of Embrocation oil on Time to Exhaustion During Treadmill Running

Kyler Daugherty, Brady Redus,

*University of Central Oklahoma*

Embrocation oil is a muscle warming oil that is applied to the skin and increases blood flow to the muscle. Athletes often use this oil as a replacement for a warm up before a training session or competition. Currently, there is a lack of research on the efficacy of embrocation oil. This study will examine if embrocation oil increases an individual's muscular endurance (time to exhaustion). The participants will consist of twenty physically fit college age students (18-30 years). Both males and females will be studied. The participants will run on a treadmill that increases in intensity (2% grade) every minute until the subject cannot continue (exhaustion). The participants will be randomly assigned to two groups and will be given embrocation oil to self-massage into upper thighs and calves during one testing period and again without embrocation oil five (5) days later during the second testing period. A dependent T-test will be conducted on the data that is collected from participant's time to exhaustion. It is expected that embrocation oil will increase time to exhaustion. The results from this study may be used by endurance athletes for performance enhancement.
02.03.10 Cost Effectiveness of the RPS Adeno Detector Plus

Mindi Combs, Dr. Earlena McKee, Linda Ray, Thomas Salmon,

Northeastern State University

Purpose. Analyze the cost effectiveness of the RPS Adeno Detector Plus Methods. We selected from patients already presenting with a red eye complaint. Our data was collected from both surveys completed by clinicians and the results of thioglycollate broth and RPS Adeno Detector Plus tests. With this data, we determined the total number of positive bacterial tests, adenoviral tests, and the total number of tests positive for both bacteria and adenoviruses. We then calculated the percentage of these types of red eyes compared to the total number of red eyes tested. Results. We found that the clinical founded diagnosis of bacterial conjunctivitis (2), 0 of 2 were correct. In addition, of those diagnosed on clinical findings alone to be of viral etiology, 2 of the 3 were correctly diagnosed. Conclusion. We found there were no changes in treatment after reading the results of the RPS Adeno Detector Plus. Because there were so few patients in this study we were unable to determine the potential value of an RPS Adeno Detector Plus relative to the cost of Tobradex.

02.03.11 “Emotional Suppression and Mimicry between Sexes”

Kiersten Durning,

University of Central Oklahoma

Abstract: This research is directed toward a better understanding of emotions being shown through Micro-Expressions, comparing an individual’s ability to “hide” their emotions comparing male and female participants. Measuring the participants’ facial movements in reaction to the picture both when inhibiting emotion and not. Micro-expressions may be socially determined with an individual mimicking another’s emotional facial expression. This study will test if pictures displaying facial expressions would be causation for more muscle movement, measured with electromyography.

02.03.12 Comparison of Load Carriage Foot Force Distribution With and Without Hiking Pole Use

Bert Jacobson,

Oklahoma State University

The use of hiking or trekking poles has gained much popularity among recreational walkers and hikers. The purpose of this study was to compare the distribution of foot force while walking with and without hiking poles. Following IRB approval, each subject was fitted with a 20 kg pack and tested while walking at 5.0 Km•hr-1 under each condition. Data were collected using a piezoelectric force plate (Kistler Instruments Winterthur, Schweis) interfaced with Bioware Analysis System. Three trials were conducted in random order 1) without hiking poles (NP), 2) with standard (SP) hiking poles, and 3) with anti-shock (AP) hiking poles. For each trial the following data were recorded: 1) Medio-lateral (FFx), anterior-posterior (FFx), and vertical (FFz) ground reaction force for the foot and medio-lateral (PFx), anterior-posterior (PFx), and vertical (PFx) ground reaction for the hiking pole. Repeated measures ANOVA yielded no significant differences in foot forces among the three conditions (NP, SP, and AP) for any of the recorded directions (medio-lateral, anterior-posterior, and vertical). The subjects felt less subjective exertion while using the poles. In conclusion, trekking poles may not redistribute force distribution to the extent that energy may be conserved, however, the perception of reduced exertion and the added stability may warrant additional research.
Comparison of the Testing of Oblique Axes in Confrontation Visual Field Testing Versus the Traditional Method

Elizabeth Fieser, Kaylaen Dittmer, Spencer Johnson, Thomas Salmon,
Northeastern State University

Purpose. To determine if testing arcuate visual fields at four locations per eye along oblique axes (at 45 degrees and 135 degrees) is as effective as testing arcuate visual fields using the traditional method of testing eight locations per eye at the principal meridians (90 degrees and 180 degrees). Methods. Eight “patients” had front surface mirror-coated lens blanks taped over each of their eyes. We placed two layers of hypoallergenic tape on the back of the lens blanks to induce different severities of quadrantanopias. Fifteen “examiners” performed a traditional visual field screener along the principal meridians and a non-traditional visual field screener along the oblique axes on each patient. The examiners recorded if they observed a defect and in which quadrant it was located. Results. The examiners were able to correctly identify 67% of eyes with the traditional method and 63% of eyes with the oblique method. The traditional method was 61.9% sensitive and 83.5% specific. The oblique method was 58.9% sensitive and 75.9% specific. A Bland-Altman analysis showed that the mean of the differences between the two methods was close to zero, however, the degree of variability between testing methods was larger than desirable. This suggests a low degree of repeatability from one examiner to the next. Conclusions. Collectively, the examiners showed slightly better sensitivity and specificity with the traditional method.

Perspectives: Oklahoma City METRO Transit Commuter Input on Transportation Services through a PhotoVoice Project

Brie Brumfield,
University of Central Oklahoma

The Oklahoma City METRO Transit system accommodates nearly 3 million bus riders each year (METRO Transit, 2009). The purpose of this research is to identify, according to regular users of the Oklahoma City METRO Transit system, aspects of transportation that are satisfactory and deserve praise and those that can be improved upon to further accommodate bus riders. The PhotoVoice project will provide public transportation users with digital cameras which they will use to take pictures of things they believe are working well with transportation and things that could be better developed. Photographs and suggestions from the project volunteers will be compiled and presented to city officials, community leaders, and METRO Transit personnel at an art studio in downtown Oklahoma City. The input of bus riders through the PhotoVoice project will allow for an open channel of communication with city leaders and provide opportunity for improvement and recognition of strengths of this widely utilized transportation system.
02.03.15  The Effects of Boot Camp Training on Body Composition

Emily Fasnacht,
University of Central Oklahoma

Boot camp training is a type of interval training. Boot camp training improves body composition at an achievable duration (Drigny, Guiraud, Gayda, Nigam, & Gremeaux, 2011; Trapp et al., 2008). The purpose of this study was to study the effects of boot camp training on body composition. Participants included 23 females (18 completed for analysis) aged 24 – 59 years with an average age of 32.9. Participants volunteered from four different boot camp locations across the Oklahoma City area. Body composition was measured by DEXA at the start of the eight week study and at the end. Participants were involved in boot camps for eight weeks 3 – 4 days per week. Each boot camp session was approximately 50 minutes long. Results of the current study show a significant difference in body weight (p=.049) with a mean weight loss of 2.2 lbs. Although not significant, fat-free mass decreased by 1.1 lbs (p=.09) and fat mass decreased by 1.1 lbs (p=0.145). The current results are in disagreement with previous research that has demonstrated favorable body composition changes following interval training. Future research should consider larger sample sizes, a longer duration for the study, and a standardized diet plan.

02.03.16  Determining a Relationship Between Sleep Quality and Academic Performance in First Year University Students

Meagan Carter,
University of Central Oklahoma

The purpose of this study is to determine if there is a relationship between sleep quality and academic performance in first-year college students. This study is significant because it is the goal of a university to educate their students and assist them in succeeding inside and outside of the classroom. Current research supports a relationship between sleep and academics, however few studies performed on sleep quality and academic performance are targeted at first-year students and without self-reported grade point averages. For the variable of academic performance, grade point averages (GPA) will be the utilized. A traditional 4.0 scale will be used to report the subjects’ grades for the semester. The Pittsburgh Sleep Quality Index (PSQI) gives a standard measurement for sleep quality through a 19-item questionnaire requesting subjects to supply information about the previous month’s sleeping habits (Buysse et al., 1989). After grades have been posted for the semester, the participants’ transcripts will be collected in order to obtain the semester’s GPA for each participant. Once data collection is complete, a Pearson’s correlation analysis will be run to determine whether there is a significant relationship between sleep quality and academic performance variables.
02.03.17  Mu Suppression in the Premotor Cortex for Recognition and Inference

Jennifer Hancock, Robert Mather,

University of Central Oklahoma

Mirroring is a learning function necessary for social cognitive processing that relies on intricate neural networks including the mirror neuron system. Mirror neurons (MN) are specialized neurons that activate when an organism facilitates movement or observes an activity. Modeling behaviors, linked to an efficient mirror neuron system, are important to social cognitive development. Social behavior is dependent on action recognition, visual analysis of the action, and intermittent inference of perceived action context. Skill acquisition and language development involve mimicry as a mechanism for interpreting sensory information. An inefficient or malfunctioning mirror neuron system has potential for pervasive ramifications concerning social interaction and development. Mu wave suppression, recorded by EEG, is a reliable method for evaluating the mirror neuron system. The expected outcome was mu wave suppression because of MN activity would display reduced mu wave capacity in each condition compared to baseline; with inference energizing MN activity in the same capacity as action observation and object recognition. A mixed factorial repeated-measures design evaluated mirror neuron activation indicated by mu wave suppression in the premotor cortex. Although mu suppression was not obvious, the difference in response for each condition suggests a variance in neural activity.

02.03.18  Emotional Intelligence Differences in Athletic Training, Physical Education, and Health Promotion Undergraduate Students

Jennifer Volberding, John Sellers, Theresa Brown, Tim Baghurst,

Oklahoma State University

Context: Emotional Intelligence (EI) is the ability to monitor one’s own emotions as well as the ability to understand and manage people. This ability is essential for all individuals, especially those who have direct contact with patients/students. Objective: The purpose of this study was to determine the overall level of EI in undergraduate kinesiology students as well as compare differences amongst the majors due to patient/student exposures. Participants: The pool included undergraduate students enrolled in the Athletic Training (AT), Physical Education (PE), and Health Promotion (HP) programs (N = 94). Interventions: Students completed an online EI inventory of 33 statements, rated on a 5 point agreement scale. Analysis: Means and standard deviations were calculated for the overall EI score (out of 150) for all students and by degree. A one-way ANOVA was performed to determine differences. Results: EI scores were 124.95 ± 12.92 for all students, 127.16 ± 12.5 for AT, 121.08 ± 11.32 for PE, and 127.56 ± 12.92 for HP. ANOVA results (F(2,91) = 2.71, p = .072) demonstrated no significant differences between majors. Conclusions: It was expected that AT students have higher levels of EI as they are exposed to significant amounts of patient contact earlier and more often than PE and HP students. However, this study demonstrated that although patient/student contacts may differ between majors, there were no significant differences in kinesiology students EI.
Health Behaviors Leading to a Higher Risk of Morbidity, Mortality, and Cardiovascular Disease Among People From India and Pakistan Living in the United States for at least 10 Years

Amreen Hemani, Dr. C. Diane Rudebock,

University of Central Oklahoma

Cardiovascular disease is the first and third leading cause of death among men and women respectively in the United States. According to the National Heart Lung and Blood Institute, within the next 10 to 15 years, Asian-Indians will account for 40 to 60 percent of people around the world with cardiovascular disease, of which 12 percent will be in the U.S. Asian Indians have been identified as one group who has a higher rate of cardiovascular disease compared to other minorities. There has been little research conducted identifying reasons why Asian Indians have higher rates of cardiovascular disease. These rates have severe public health and financial implications. The purpose of this research is to determine what health behaviors lead to this high prevalence of cardiovascular disease. The hypothesis is that lack of physical activity and length of time living in the U.S. contribute the most to a higher risk of morbidity, mortality, and cardiovascular disease among people from India and Pakistan. A survey with questions relating to physical activity, cardiovascular health, food and vegetable consumption, and level of acculturation was given to a group of Indian and Pakistani people residing in the U.S. for at least 10 years. Preliminary findings suggest that lack of physical activity may be a contributing factor to cardiovascular disease and/or related conditions. No findings indicate that acculturation to an American diet is related.

Understanding the Impact of a Service Learning Project on Students’ Transformative Learning Experience

Rachelle Franz,

University of Central Oklahoma

Transformative Learning (TL) is a process that involves cycles of cognitive dissonance, critical reflection, rational dialogue, and committed action that requires students to take an active role in their learning. Service Learning (SL) is a pedagogical strategy, used to provide a service to the community in connection to an academic discipline, which helps students enhance educational competencies. The purpose of this research is to develop more effective pedagogical approaches (for volunteering instructors) by implementing SL into Healthy Life Skills (HLS) course design and to evaluate its effectiveness on students’ learning perspective. It is hypothesized that scores from Student Perception of Instructional Effectiveness (SPIE) will indicate an effective teaching methodology as a result of TL training and positive TL experiences for students. The researchers collaborated with Center of Excellence in Transformative Teaching and Learning to provide free workshops to HLS instructors to help them redesign their course syllabus. Quasi-experiment was conducted: Control (Fall 2012) and Treatment group (Spring 2013). Baseline scores were acquired using comprehensive final exams and post test scores using comprehensive final exams, SPIE, demographic, and qualitative questions. The researchers believe that TL experiences will help students acquire new perspectives about health and will help them become more engaged citizens in their community.
02.03.21 Evaluation of a Fitness-based Intergenerational Transformative Learning Experience

Terry Taylor, Darla Fent, Jacilyn Olson, Matthew Blair, Melissa Powers, University of Central Oklahoma

The purpose of this study is to examine students’ attitudes toward older adults and community service before and after a senior fitness class assignment. The participants will be students enrolled in an undergraduate exercise programming class. For a class assignment, students will conduct fitness testing at a local retirement community, and then develop exercise recommendations based on the testing results. The students will be surveyed to assess attitudes from the beginning of the semester to end to monitor changes in attitudes/beliefs toward older adults and in the ability and confidence in working with this population. The potential outcome of this study is that the students will have a more positive attitude towards the elderly and be more likely to consider a career in working with geriatric individuals/clients. From this study the authors will show the benefit in sustaining this project as well as adding similar programs to the curriculum.

02.03.22 A Service Learning Project Connects Dietetics Students With the Realities of Teenage Mothers and Their Children

Tawni Holmes, Jenny Bilodeau, Katherine Powell, Rachel Hill, Sarah Rakowski, University of Central Oklahoma

Service Learning is a key tenant of transformative learning. Dietetic students in the Medical Nutrition Therapy course at the University of Central Oklahoma had the opportunity to learn valuable hands on menu planning skills as a service learning project conducted with the Pauline Mayer group home in Oklahoma City in Fall of 2012. The home is a place for teenage girls who are pregnant or have infant children to live while they finish high school. A previous visit with the group home gave members of the class observational data regarding the needs of the girls and their children and the circumstances in which they live. At the request of the home students in the class revised the current menus to meet the 2010 Hunger Free Kids Act guidelines for both teenagers and infants. The class conducted a literature search as well as researched the needs of both age groups for nutrient intakes and portion sizes. User-friendly tools for meal planning and grocery shopping were also developed so that the girls could learn life-long skills which could potentially affect their future ability to care for their children once they were living on their own. Follow-up with the Director of the home has provided positive feedback on the use of the menus and the usefulness of the tools for this age group. Feeback from the students of the course indicated that this was a valuable learning experience and provided an excellent opportunity for meeting a needed competency skill.
02.03.23 Correlation Between Speed and Strength in an Un-Weighted Straight Punch

Zachgery Scurry, 

University of Central Oklahoma

The purpose of my study is to determine the correlation between speed and strength in a straight punch. I will test 20-30 college students’ speed and strength in a straight punch. A bivariate Pearson Product Moment Correlation will be the statistical method used to determine the relationship. The first test will be to determine punching strength. To obtain this data each student will perform a one repetition weighted cable push (simulating to actual motion of a straight punch). The equipment to be used in the strength test will be the Pro-Maximum Single Pull Cable Column. The cable will be adjusted to arm pit height of the participant. Participants will then be asked to perform a straight punch with their dominate hand. Starting at 10-15lbs, the student will perform one punch at 5lb increments, until he or she reaches their maximum weight. The second test will be to measure the speed of each student’s punch. To measure the velocity of a punch the Humac 360 (Computer Sports Medicine Inc. Stoughton, MA) will be used. A Humac 360 is a small computer box with a 16 ft. cord attached, it is designed to be pulled to determine velocity. Each student will be given three attempts to reach their peak punching velocity. My hypothesis is that the two will have a significant positive correlation. Related research has tested speed and strength before but there has not yet been done a direct correlation between the two. Awaiting IRB approval.

02.03.24 The Effects of Plyometric Exercises on Vertical Jump in Male and Female Basketball Athletes

Toral Desai, Patrick Lawrence, 

University of Central Oklahoma

Strength and conditioning are frequently used in a variety of sports in order to enhance performance. While strengthening is important, plyometrics are a part of sports specific training that has the ability to increase explosiveness and power. The purpose of this study is to determine if plyometric training increases vertical jump in female and male basketball athletes. The hypothesis of this study is that over time and with adequate training, both female and male basketball athletes will improve their vertical jump which would benefit their productivity on the basketball court during games by enabling them to block shots or produce points for their respective teams by creating basketball shots for themselves. Approximately twenty female and male basketball athletes have been recruited from the University of Central Oklahoma’s women’s and men’s basketball teams in February of 2013. Data of the vertical jump will be collected by using a Vertex instrument. Athletes will be asked to jump for three consecutive jumps and the average of the vertical jump will be collected as data. Upon the completion of the regular basketball season, athletes will be given a six week plyometric training regimen. This will consist of a twenty minute session twice a week of plyometric drills. At the end of every week, vertical jump of each participant will be measured and data will be collected. An ANOVA with repeated measures will be conducted to analyze data.
Differences In Eating Schedules, Sitting Time, Steps per Day, and Amount of Physical Activity Between Staff and Faculty.

Alaura Ervin, Greg Farnell,

University of Central Oklahoma

The purpose of this study is to compare BMI, eating behaviors, steps per day, and exercise habits of faculty and staff on the UCO campus. The hypothesis of the current study is that faculty member will have lower BMI’s, higher steps per day and greater amounts of physical activity (exercise habits). The current hypothesis is based on existing literature that found American’s decline in physical activity and increase in energy consumption can be contributed to the boost in figures of obesity rates. From 1950 to 2000, the amount of people working in sedentary jobs was 76% (Brownson, R.C. et al., 2005). The results from this study may alert staff members who usually sit for longer than 6 hours during work, may result in an increased BMI and increased sedentary lifestyle habits, both negatively effecting their overall health. Employees will receive the survey to complete online using UCO’s survey tool, Qualtrics. Once they have completed the survey, 16 participants (8 staff and 8 faculty) will be randomly selected to wear accelerometers. The 16 participants will wear the accelerometers for 4 weeks and record their steps daily. The participant will turn in a daily step log sheet every week for four weeks. This study may determine common trends between individuals who spend large amounts of time sitting compared to individuals whose job duties require more physical activity. This study will compare differences between length of time sitting at work between staff and faculty.

Knowledge of Physical Activity on Campus

TaNiqua Ward, Melissa Powers,

University of Central Oklahoma

Purpose: The purpose of this study is to examine the relationship between the knowledge of physical activity and current physical activity levels among college students. Methods: The study will be conducted through two surveys. One survey will be true or false asking questions about the knowledge of physical activity. The other survey is the short International Physical Activity Questionnaire (IPAQ) that will ask questions pertaining to the student’s current physical activity level. All the participants will be students at the University of Central Oklahoma (UCO). Pearson’s product moment coefficients will be calculated to determine the relationship between knowledge of physical activity and current physical activity levels using SPSS software. Results: College students that are knowledgeable of physical activity are expected to be more physically active than those that are not as knowledgeable. The results found from this study will be used by UCO health educators to identify target areas for physical activity promotion among UCO students. Conclusion: This study will be beneficial for future studies because it can assist UCO with educating students about the importance of physical activity for health. UCO can begin an intervention with students to target the health consequences of an inactive lifestyle. This will help make students more self aware of their own health and allow students to have healthy lifestyles now and in the future.
Does the Use of the FITBIT Accelerometer Affect Physical Activity Levels?

Ryan Westrup, Greg Farnell,

University of Central Oklahoma

Physical inactivity and obesity are global problems with increasing prevalence. Previous research has demonstrated that the use of accelerometers increases physical activity levels. The purpose of this research project is to determine if the FITBIT accelerometer increases physical activity levels. This study will include 20 participants; ten in the treatment group who will wear the FITBIT for 6 weeks and 10 in the control group. Participants were recruited by email from the UCO Employee Wellness Program, UCO Wellness Center staff, and the Kinesiology Department faculty and staff. All participants will complete the Human Activity Profile (HAP) survey to determine physical activity levels pre and post. Data from the FITBIT accelerometer will be obtained weekly from the treatment group. The current hypothesis is that wearing the FITBIT will increase physical activity levels compared to those not wearing the FITBIT. The FITBIT has features that make tracking activity levels easy, allowing one to compete with oneself, and others. Future studies should look into if the FITBIT actually motivates individuals and what factors cause an increase in physical activity levels. Also, studies should look into whether the FITBIT accelerometer is more beneficial at increasing activity levels compared to other accelerometers.
02.05.01 The Effect of Gender and Town Size on Stress Levels of University Freshman

Mark Giese, Kassie Kerns,
Northeastern State University

The Effect of Gender and Hometown Size on Stress Levels of University Freshman Kassie Kerns and Mark L. Giese Abstract: The purpose of this study was to determine if either gender or hometown size had an effect on the stress levels of University freshman. Two hundred and twelve (212) freshmen enrolled in eight sections of a Personal Health General Education class served as a convenience sample. After proper IRB approval, the subjects were administered a 20 question stress questionnaire taken from their course textbook. The answers to the stress questionnaire served as the dependent variable and gender and town size were the two independent variables. A two way Analysis of Variance (X2 ANOVA) indicated that hometown size was significant (F = 3.3, p = .04) at the .05 level of significance. A Scheffe post hoc analysis indicated that the difference was between the large and small towns with the students from the smaller towns reporting higher levels of stress. The implication is that students from smaller towns may need more encouragement and additional means of support in an effort to reduce stress levels during and prior to the end of their freshman year in college.

02.05.02 Making the Grade in Physical Education: Why Effort and Participation Should Not Count

Tim Baghurst,
Oklahoma State University

Assessment in physical education is not a new topic, yet opinions regarding how physical education should be assessed vary greatly. Although some argue for skills-driven measures of competency, others believe that attributes such as attitude, effort, and participation are equally or even more important. The purpose of this presentation is to provide an overview of the current literature surrounding effort and participation as a component of grading in physical education. Using an historical approach, this presentation will explain how grading in physical education has changed over time, yet remains steeped in tradition, sometimes to the cost of the profession. Discourse on the impact that varying methods for assessment have on the physical education profession is provided, followed by a best-practice method for including effort and participation in assessment.
02.05.03 Successful use of pokéwalker: one girl's story

Yoonsin Oh,

Cameron University

This qualitative case study was conducted to investigate how girls used pokéwalkers in an exergaming program. A pokéwalker is a special pedometer made for the Nintendo DS games Pokémon HeartGold and SoulSilver. A pokéwalker allows players to walk pokémon, collect an in-game currency by walking, and connect with other pokéwalkers. The girls in the program walked together and played either Pokémon HeartGold or SoulSilver using a pokéwalker. The pilot program was with 6-8th grade girls attending Girls Incorporated (Girls Inc.) in Spring 2011. The summer program was with 5-6th grade girls attending a local community center’s summer camp in 2011. Data collected includes observations, field notes, interviews, documents, and audio and video recordings of interactions and conversation. As Stake (1995) suggests, two strategies were used to draw meanings: direct interpretation and aggregation of instances. One girl in the summer program continued to wear her pokéwalker for another eight weeks after the program was finished. The researcher examined this girl's case to understand the reasons for differing pokéwalker use. This case study helps us understand girls' usage of pokéwalkers and provides insight in developing technology to promote physical activity in girls.


02.05.04 The Energy Expended While Playing the Xbox Kinect

Isaac Henry, Greg Farnell,

University of Central Oklahoma

The Centers for Disease Control and Prevention reported in 2009 that only 18% of high school students participated in at least 60 minutes of physical activity per day. Playing video games has become a significant part of children’s leisure time activities. This has lead to increased time spent being inactive thus being a possible contributor to the current childhood obesity epidemic. The purpose of the current study is to determine energy expenditure of three different Xbox Kinect interactive video games. Students at the University of Central Oklahoma will be recruited to participate in the study. Participants will play UFC Personal Trainer, Zumba Rush, and Just Dance 4. Each game will be played for 20 minutes totally 60 minutes of activity. Oxygen consumption and energy expenditure will be continually measured by a Parvomedics metabolic cart. It is anticipated that if participants fully engage in the video games they will reach a level equivalent to moderate intensity exercise. The results of the current study may provide fitness professionals, parents, and teachers an additional option to increase physical activity levels in children.
Physicians’ Perspectives on Fluctuating Hearing Loss and Speech-Language Development

Tina Deaton, University of Central Oklahoma

According to the Centers for Disease Control, in the United States, approximately 12,000 babies a year are born with hearing loss (33 babies a day). Although this number may seem high, this does not include children who acquire a loss later in life or that have some form of fluctuating hearing loss. Ear, Nose, and Throat (ENT) physicians play an important role in the lives of children with recurrent ear pathologies. Physicians are often the first line of defense for these children who are at risk. Early intervention is the key to helping children have the best chance for normal development throughout life. The purpose of this research is to see if ENTs feel that hearing problems are a reason for concern in regards to speech and language development until children are around 3 years old. Unnecessary barriers are being created for them by waiting until they are 3 years old to intervene. Some children may “catch-up” with their peers, while others may never recover to normalized developmental standards. Depending on the results from the survey, certain steps may be taken to create continuing education opportunities to educate the physicians on the impact they could have on a child’s communication skills. This data will also provide information on the need for resources for families faced with these circumstances.

The Impact of the Timing of Feedback on Student Retention

Mark Maddy, Linda Rittner, University of Central Oklahoma

Providing feedback in a timely manner is important to the successful attainment of desired learning. This study compared the use of the Immediate Feedback Assessment Tool (IF AT) to a traditional assessment method of using a Scantron. Students enrolled in a teacher education program were given a number of chapter quizzes prior to unit assessments using one of the assessment methods. A correlation was found between higher levels of retention of material with those using the IF AT than for those using the traditional method. In a survey of those who had used the IF AT, those students were also favorably inclined to incorporate similar tools in their future classroom assessments.
02.06.03 Mapping the Education of a Pre-Service Urban Teacher

Diana Meek, Mike Nelson,

University of Central Oklahoma

The vast majority of pre-service teacher education occurs in the university classroom away from environments in which teachers will actually be practicing their craft. Therefore, there is a necessarily theoretical attribute to pre-service teacher training. One of the issues that educators of future teachers are concerned with is the effectiveness and utility of the coursework that pre-service teachers receive. This study attempts to explore whether classroom teachers who have graduated from the Urban Teacher Preparatory Academy (UTPA) at the University of Central Oklahoma are utilizing the knowledge that they receive both from their university classrooms and from the professional development provided through the UTPA. Here, I present the first piece of this study. This will be an exploration of the knowledge, goals, and objectives that are presented within the Professional Teacher Education Sequence at the University of Central Oklahoma as well as within the professional development and mentorships provided by the UTPA.

02.06.04 Comparative Study of Two French Painters David and Delacroix

Maria Chacon, Claire Westlund,

University of Central Oklahoma

The French Revolution (1798-1799) brought significant change to French culture, including art. This presentation demonstrates the change in art by examining the artistic movements and the work of the major artists Jacques- Luis David (1748-1825) and Eugene Delacroix (1798-1863). First, it discusses the Rococo style of art before the French Revolution. Second, the Neoclassical artistic tradition is examined as it was used before and during the revolution. Third, Romanticism as the reaction to Neoclassicism is presented.
The Nation of Islam in Visual Culture

Mickayla Fisher,

University of Central Oklahoma

The subject of this project is the Nation of Islam (NOI) in visual culture. The aim of this presentation is to present changing principles of the NOI throughout its history. First, the presentation discusses the formation of the NOI in the 1930s during the economic hardship in the United States. Second, the NOI's expansion during the Civil Rights movement of the 1950s and 1960s is discussed. Third, the NOI going global is examined. The project discusses the principles of the NOI as well as the societal reaction to its expansion. A particular emphasis is placed on media in order to make the audience aware of reductionist representation of the NOI in visual culture.
03. Fine Arts and Design

02. Dance

03.02.01 Dancing With Technology: Creating New Interactions Between Music Composition and Dance Choreography with Movement Controlled Sound and Video in the Collaborative Performance, Network

Aaron Robinson,

University of Central Oklahoma

Recent innovations in computer music technology have made possible a new approach to music composition and dance choreography: the compositional and choreography processes have equal determination in the creative process, even to the point of rendering that process in real-time. These technologies include hardware and software for real-time audio and video creation and processing, and interactive computer programming. This project, supported in part by a grant from the Office of Research & Grants, The University of Central Oklahoma, explores new approaches to performance art by experimenting with some of the aforementioned technologies in live performance environments. Through experimentation and this technology, dancers are able to affect the live sound and video projections with their movements in realtime. All of the audio and video processing tools were written in Max/MSP computer software. Working with Austin Hartel and dancers from The Hartel Dance Group of Oklahoma City, I was able to conduct hands on research into new interactions between music/video composition and choreographed/improvised dance. This collaborative exploration of technology, music, video and dance led to Network, premiering in Oklahoma City at The Magnolia Building on June 7th, 2012 and subsequently performed multiple times over the past year at venues such as The Oklahoma City Museum of Art and at Living Arts in Tulsa, OK.
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03. Fine Arts and Design

03. Design

03.03.01 Comparative Technology Assessments for Curricular Reform in Graphic Design The Letterpress Lab Project

Amy Johnson,
University of Central Oklahoma

This project tests two letterpress machines that produce the same end result but require different creative processes and pedagogical approaches in the context of a lab to refine teaching methodologies in the discipline of graphic design. Letterpress is the relief printing of text and image using a press with movable type, which is inked and then pressed onto paper. Prior to the computer designers often used the qualities, capabilities and limitations of available technology as an integral part of their problem solving and design process. In many ways the limitations of the equipment at hand forced innovations and expansions within the discipline. Today much of the work of design takes place in the environment of the computer and, while this is an incredibly valuable and powerful tool that engages the student's hands, minds and eyes it is an abstractly mediated process in which constant change is possible without record of iterations tried. The power of the computer has in many ways removed innovation, born from limitation, from the discipline of design. The goal for this project is to develop curricular environments that a) test the impact of reintroducing hand-based skills into the graphic design curriculum; b) test through comparative assessment student learning with hand-based tools verses mechanized tools and c) test student comprehension of design vocabulary that stems from letterpress technology.

03.03.02 Letterpress And The Digital Era

Amanda Horton,
University of Central Oklahoma

survey of the development of the history of typography from Gutenberg to the modern era and covers new digital technology as it relates to typography. This course covers the tools, materials and machines used in the development of type over time. In order to help students learn about historical methods an assignment was created that utilized new digital technology. This paper asks the question: Can new technology help students to understand the past? The technology used for this course is LetterMpress and is available on Mac and iPad. This is a digital tool that simulates what it would be like to create printed pieces on a letterpress machine. With digital advances, some of the traditional printing methods such as letterpress are becoming less and less prevalent. LetterMpress is a unique tool that allows you to learn about this traditional printing method in a digital format. This project helps students to determine the historical significance of traditional and digital typography and to understand the lasting effects that traditional typography still holds on us today.
03.03.03 Technology meets Type: An explorative study of cases where technology has affected the design of typography and vice versa.

Lanie Gabbard, Miranda Lloyd,

University of Central Oklahoma

The marriage between graphic design and technology has been inevitable. While numerous studies have been done within this topic at a broader level, this project aims to identify and document case studies and analyze new typeface design technology to demonstrate how emerging technologies are affecting the design of typefaces. A compilation of case studies found through this research will be documented and it is the intent of this project to aid teachers of typography, design students and typeface designers. These cases can help students bridge the technical knowledge they learn in class with real-world examples of typographic challenges. In addition to documented cases, this project also intends to investigate new software that can be used to develop typefaces to further the discussion on the relationship between typography and technology. The investigator intends to analyze the software for its limitations and advancements from hand-based design so conclusions may be made with regard to the possible design approaches for typefaces in the future. For this part of the project, a new typeface will be designed in the new software. Currently, this project is still in progress. The investigator is continuing to document case studies and is in the typeface development stage of the project.

03.03.04 Continuing the Investigation: Applying Bloom's Taxonomy as the Framework for Advanced Illustration Studio Objectives

Keith Webb, Rukmini Ravikumar,

University of Central Oklahoma

This study explores curricular reform of beginning, intermediate and advanced studio illustration coursework taught in the Department of Design at the University of Central Oklahoma (UCO) through the application of Bloom’s Revised Taxonomy. A previous study was conducted, showing evidence of improved outcomes for two test groups. Results showed that student outcomes regarding illustrative performance improved significantly in Illustration I and moderately in Illustration II. While the findings were promising, the data was insufficient to support a conclusion as to why there was a greater increase in Illustration I cores vs. Illustration II with this pedagogical design. Additionally, would the application of Bloom’s Revised Taxonomy, as it was applied in the earlier study, influence other mid level and upper level illustration course project outcomes in the same way? In the proposed investigation, four courses will be examined and samples taken from Illustration I, II, III and Environmental Illustration courses in the Graphic Design Program. Prior to testing, student participants will be divided into two groups based on their standing in class after a precursory assessment of student illustration portfolios. Both groups will receive the same project but one group will receive instruction based on Bloom's Revised Taxonomy learning objectives. The results of this investigation is relevant to the future of curriculum design in Illustration.
Restructuring of Interior Design Education

Kevin Steiner,

University of Central Oklahoma

Interior Design pedagogy is becoming a function of blending established theoretical and design educational practices with more problem-based teaching and learning strategies. Millennials students need hands-on, interactive assignments they see as relevant. What types of projects can be developed that students of the Millennial Generation see as relevant, providing them the opportunity to gain and implement knowledge associated with the Interior Design profession? Traditionally projects in the studio environment have utilized a hypothetical, pretend client the student never meets. This approach separates the student from the end user and, as a result, the student tends to design the final solution to suit their needs, not the client’s. The newly developed and adopted approach to project completion introduces an actual person to serve as the client. The project developed for this presentation is a result of combined research, and also a hands-on approach to the client-designer relationship. Findings of this procedure for project completion include a heightened awareness of all project deadlines and students’ own professional traits. With this new approach, students realize the solutions they are creating are for someone else, and this realization helps students not to take criticism personally. Furthermore, this approach allows the students to see and practice the relevant objectives, and have the appropriate instant feedback that is desired by the student.

Think Different Making a Case for Teaching Design Thinking as a Part of the Undergraduate University Core Curriculum.

Amy Johnson, Catherine Webster,

University of Central Oklahoma

This project will take design thinking outside design schools and into the general population by creating a Design Thinking Course focused on teaching creative problem solving techniques, flexible thinking, idea generation and idea testing that is suitable and applicable for a University Core offering. This innovative thinking combined with the problem solving and implementation skills inherent in a design education could transform the way students of all disciplines approach problems and develop solutions. This learned ability to think freely within very tight constraints could challenge the status quo in almost all areas. This project would be a significant innovation in teaching creative problem solving and in the core curriculum at the University level. Resulting curricula will be introduced as a short course at UCO and student evaluations used to develop a proposal to implement the project as a full semester course to meet UCO’s Critical Thinking/Aesthetic Analysis core requirement. Research and implementation of this project is ideally timed. Newsweek’s article, “The Creativity Crisis”, has sparked a good deal of discussion within the University system. While budgets continue to be cut, universities are realizing that individuals who can see problems as opportunities and view challenges as puzzles to be solved, will be the most successful graduates. They will become professionals able to survive and flourish in turbulent times.
03.03.07 The Language of Critique

Rukmini Ravikumar, Krystal Davranoglu,

University of Central Oklahoma

Design is a discipline that deals with solving problems creatively and communicating messages visually. In order to successfully train students in visual problem solving methods it has become imperative to emphasize the process of solving a problem rather than the solution itself to heighten critical thinking in classrooms. A 2008 study titled, ‘The Creative Problem Solving Process in Graphic Design Classrooms,’ published in the International Journal of Design (Volume 2, No 2) established that an emphasis on process and student-faculty discussions on process could resolve the credibility issues faced by the profession of design. A case was made then for the need to emphasize the creative problem solving process, allowing design instructors to spend more time on how and why a student arrived at a particular design solution and steer away from decisions driven by aesthetics alone.

Critique is a process that is integral to design classrooms, has been acknowledged as a seminal teaching and learning methodology. This process requires the instructor cast an objective eye over the work and help the student negotiate their way to the final solution through dialog, analysis and presentation. It requires students to divorce themselves from their work such that they can actively participate in its deconstruction or even demise. This study hopes to analyze and codify the vocabulary used in critique environments.

03.03.08 A Hand in Design

Joanna Meachum, Rukmini Ravikumar,

University of Central Oklahoma

This project will determine the effectiveness of graphic design elements via hand done graphics versus computer generated graphics. It will determine why one is preferred over the other, and if there is a point to where graphics become repugnant. It will also determine if there is a correlation between tactile response and the viewer in relation to these graphics.

03.03.09 The Abstract Visual Elements in Graphic Design

Zixuan Zhu, Xiaomiao Wang,

Southwestern Oklahoma State University

Visual communication is communication through visual elements. In graphic designs, sometimes designers use abstract shapes, lines and graphics to communicate with viewers. Even without photos or illustrations, people can understand a graphic design unit that only contains abstract elements. Can abstract elements tell a narrative story? By exploring and analyzing design methods and principles, I pursued a way to arrange abstract visual elements that can effectively present designer’s idea. As a result, I developed an illustration children’s book that doesn’t have any narrative images or illustrations, and use only abstract visual elements.
03.03.10  Sense of Touch in Graphic Design

Chenming Jiang, Xiaomiao Wang,

Southwestern Oklahoma State University

Graphic design focuses on communication. It is undertaken to convey a specific message to a targeted audience. It typically communicates in a visual way to those with normal vision. Can graphic design be conveyed to those without vision, and how? The people with weak vision usually have good tactile sensation. With some practice they are 9 times better than others. The blind read braille. They touch dots, lines, and shapes to recognize texts. Instead of communicating directly with what they touch, the blinds respond to the words. My design offers the blind experience how sense of touch can raise imagination and emotions. Using a wide range of materials, and manipulating the surfaces can achieve various textures. Exploring how different textures can bring the blind the impact of human sentiments can be a solution to fulfill the purpose of graphic design. Meanwhile, in general graphic design, the texture brings another aspect for designers to convey their idea, and for audience, it stimulates their imagination from both visual and sense of touch.

03.03.11  Kamrooz Aram: People just want the ones that look good

Erica Eppler,

East Central University

As an Iranian American, Kamrooz Arams' art allows him to explore the intersection of Eastern and Western culture. He explores issues of nationalism, religion, identity, and exoticism by layering familiar images from both cultures in his work. Arams' paintings are playful and serious, magical and scholarly, spiritual and secular and they open up a discourse about the complexities of human nature that few are willing to discuss openly. A flat landscape comparable to the Super Mario Bros. video games are used in most of his paintings and he connects with the modern culture through these references. In this setting he places burning vegetation, clouds, and birds of prey found in Persian carpets and miniatures. Through these motifs he asks his audience to reflect on their own preconceived ideas and to confront cultural issues. That is what makes his work stand out from others whose work deals with identity, nationalism, religion, and Orientalism. He sees problems faced by society, but does not let these oppressive subjects overcome him from all the beauty that is in this world.
The “Technicolor City” Project: Collaboration Demystified

Amy Jacobson-Peters,

University of Central Oklahoma

One of the hardest concepts to grasp as a young designer is that an individual does not design alone in a vacuum. A designer always works with others. At the very least, a designer collaborates with a client; but often works with many people to achieve a successful end result. Collaborations involve material representatives, manufacturers, and other designers. Because design relies heavily upon teamwork, a designer must develop communication skills and collaboration techniques; key qualities vital to achieving effective results. As a design student in foundation level classes, creating a situation where collaboration and communication can be practiced is a challenge. The “Technicolor City” project, incorporated into a second semester design course, allows beginning students to develop these skills on a grand scale. As a class, students develop a concept and design a model city. Each student is responsible for one 12” x 12” square which must work cohesively with the other squares around it and ultimately within the entire city structure. Working and collaborating as an entire class is often daunting and overwhelming for beginning learners. This paper relays the process of creating city concepts utilizing design-based strategies. Employing professional design techniques outlined in Tom Kelley’s book, “The Art of Innovation,” helps make a difficult process both fun and engaging, ultimately easing the collaborative process.

The Use of Letterpress Printing as an Aid in Graphic Design Entrepreneurship

Stephen Treadwell Jr., Amy Johnson,

University of Central Oklahoma

With a down economy, many young graphic designers have trouble staying afloat. With low entry-level salaries and the small availability for new hires, how can they survive? Many graphic designers have opted to create products of their own to sell in conjunction while maintaining their career. Letterpress printing was invented in the 15th century by Johannes Gutenburg and over the years has fallen into the background with the rise of digital printing and media. Recently letterpress printing has seen a revival due to its tactile nature that cannot be achieved through digital means. With this revival I will discuss how it’s possible to create products that graphic designers can create through letterpress printing and how these products can create an additional income.
Interior design education often focuses on developing new spaces; however, it is increasingly important for designers to utilize existing building stock as part of environmentally responsible design strategies. Students who work with existing buildings gain valuable expertise in historic preservation, which is one element of a sustainable design strategy, while learning about a field of expertise for practicing designers, a critical concern in the difficult job market into which our design graduates are emerging. To expose interior design students to historic preservation and its relevance to interior design and sustainability, a capstone project asked students to rehabilitate a historic building for a new community art center. The project required students to incorporate appropriate spaces into the existing building, utilizing such sustainable strategies as daylighting and recycled materials. Students researched the history of the building, and were required to follow documented standards with regard to the arrangement of interior spaces and the selection of new finishes in those areas with existing surfaces remaining. The resulting designs not only exposed students to the rigors and rewards of connecting interior design and historic preservation; it also helped them develop valuable skills in historical research while developing awareness that environmentally responsible design involved a broader scope than simply specifying recycled materials for new construction.
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03. Fine Arts and Design

05. Music

03.05.01  Comprehensive History of Western Music Education
Sion Honea, Annette Nashire, Emerald Lessley,
University of Central Oklahoma

The purpose of this project is to complete preparatory work toward the production of a comprehensive history of music education. This will cover the history of western music education from antiquity to the present and correlate its various manifestations and objectives with relevant philosophies of music education, explicit or implicit. Despite the fact that numerous histories of music education exist, in each case limited by such factors as geographical area, target population, chronology, educational approach, and philosophical foundation, no comprehensive history of music education has ever been produced. The immediate practical result of this lack of historical awareness is a fragmentation and confusion in approaches to music education, as well as inefficiency in methodology. A comprehensive history such as that projected in this project will bring a greater understanding of historical trends and philosophical purposes to present practice. It should also provide the basis for the development of a first, truly effective music advocacy that can be emulated in other fields of art.

03.05.02  Italian Renaissance Vocal Improvisation
Sion Honea,
University of Central Oklahoma

The purpose of this project is to make available to professional musicians, performers and educators, the corpus of texts on the tradition of Italian Renaissance Vocal Improvisation. Vocal Improvisation in the renaissance was a standard technique applied to both solo and ensemble vocal music. This practice rendered music in performance far different from the bare musical texts that we possess. The understanding and practice of this skill has lagged far behind other areas of the expanding field of historical performance, mainly for the reason that the relevant instructional materials, both literary and musical texts, have seldom been translated or issued in new editions. In fact, only one text, literary and musical, has ever been made available in entirety. Even in this case, the literary text of this new 2009 edition is only an updating of a 17th-century translation. In the remainder of cases, at most only fragments and excerpts of the literary and musical texts have been made available in English. This project aims to produce new English translations of all relevant literary texts, accompanied by exemplary musical material sufficient to provide a modern performer or educator with access to acquiring the skill.
03.05.03 Ornaments: A Historical, Chronological Digest

Sion Honea,

*University of Central Oklahoma*

At present many treatments of musical ornamentation exist but are limited in one or more ways. Some are scholarly treatments that are difficult for practical use. Others are limited to individual performing mediums such as keyboard or string instruments, while others are limited by historical period. The purpose of this project is to produce a practical guide to ornamentation that gives access by (1) type of ornament (2) historical period, and (3) performing medium. The procedure is to survey primary sources from approximately 1500 to 1900, compile their comments on ornamentation in chronological order, and provide cross indices according to performing medium and author. Further cross indices are necessary because of the extreme lack of standard terminology even within one historical period. One term may be used for quite different ornaments and many terms may indicate only one ornament. The end product will also provide scholars in the field a way to follow the development of practice and terminology as stated by individual authors and in any particular historical context.

03.05.04 Center for Historical Performance

Sion Honea, Tess Remy-Schumacher,

*University of Central Oklahoma*

The Center for Historical Performance is a new entity established by the School of Music of the College of Fine Arts and Design at the University of Central Oklahoma. Its mission is: Historical Performance improves and promotes learning for students and teachers. The Center serves the University of Central Oklahoma and extended community with concerts, visiting artists, master classes, lectures and coursework. The new Center takes advantage of the large number of existing faculty in the School of Music who possess specific training and experience in the field of historical performance and scholarship. Its inaugural activity was a concert produced on February 19, 2013 that presented a historical performance of François Couperin’s *Apotheose de Lully*, which involved extensive historical research in performance practice as well as performance on historical instruments. The Center also aims to serve as a focal point for stimulating interdisciplinary activity among departments of the College of Fine Arts and Design and other Colleges of the University of Central Oklahoma.

03.05.05 An Evening with Louis XIV

Sion Honea, John Clinton, Tess Remy-Schumacher,

*University of Central Oklahoma*

On February 19, 2013 the Center for Historical Performance presented its inaugural event, the historical performance concert “An Evening with Louis XIV.” The Center for Historical Performance is a new entity of the College of Fine Arts and Design’s School of Music. This concert was devoted to music of the time of Louis XIV and featured a historical performance of François Couperin’s famed “Apotheose de Lully,” a programmatic work extolling the musical genius of Jean-Baptiste Lully, effective creator of the French operatic tradition Tragédie Lyrique. Production of the concert required extensive research in historical performance, especially musical interpretation and ornamentation, in order as nearly as possible to recreate the music as heard at the time of Louis XIV. The work was also performed on historical reproduction instruments. The dean of the College of Fine Arts and Design, Dr. John Clinton, conducted an ensemble composed of faculty artists and School of Music alumni.
A Residency With Pulitzer-Prize-Winning Composer Michael Colgrass: Transformative Collaboration and Interaction between Students, Faculty, and Audiences through Creativity and Performance

Brian Lamb, Amy Johnson, Chelsea Maupin, Elijah Levingston, Ganbayar Gansukh, Hannah Howard, John Shell, Travis Welborn,

University of Central Oklahoma

The Transformative Residency with composer Michael Colgrass is a creative and scholarly activity with an educational component; culminating in a guest artist residency on the UCO campus, live musical performances, and a professional commercial-quality compact disc. Collaboration is the central element of the entire experience, and the project is permeated with inter-related and overlapping opportunities for students to collaborate not only with one other, but also with faculty artists and soloists, a Pulitzer-prize-winning guest composer-in-residence, recording engineers, and producers. This project includes multi-disciplinary collaboration between students and faculty in the School of Music and in the Department of Design, where students guided by co-principal investigator Amy Johnson will engage in the creative layout and design of the CD and its packaging. This project benefits hundreds of students on the University of Central Oklahoma campus by providing transformative learning experiences in the areas of: Creativity Excellence in Performance (Using Neuro-Linguistic Programming to Optimize Performance in Life) How to Think Like a Kid Three Separate Concerts of Michael Colgrass’ Original Works The professional commercial-quality compact disc recording will also make a significant contribution to the recorded repertoire of the wind band, as the recording will contain previously un-recorded works by one of this country’s most prolific composers.

Agréments du Chant: French Late Baroque and Early Classical Vocal Ornamentation According to the Primary Sources

Emerald Lessley,

University of Central Oklahoma

While researching French baroque performance practices, it became apparent that there is a disparity among some early authors, especially in the area of French baroque vocal ornamentation. The goal of this project was to see if any correlation could be found in the ornament descriptions, and if so, whether the correlations reveal any performance trends. The selection of texts used was limited to French baroque and early classical sources discussing vocal ornamentation. The texts used are Bacilly, Remarques curieuses sur l’art de bien chanter (1671), Loulié, Eléments ou principes de musique (1696), L’Affilard, Principes très faciles pour bien apprendre la musique (1697), Bérard, L’Art du chant (1755), Corrette, Le Parfait maître à chanter (1758), Lecuyer, Principes de l’Art du Chant (1769), and Raparlier, Principes de Musique: les Agréments du chant (1772). Texts in their original languages were used so as not to be subject to misinterpretation of English translations. The intention was to identify a standard repertoire of ornaments used during the century researched. The primary relationship between the authors implied by the information is one based on the time period in which the respective authors were active. Additionally, there seems to be a definitive standard repertoire of ornaments based on the lists, descriptions, and musical examples given by the selected authors.
Abstracts from the 2013 Oklahoma Research Day
Held at the University of Central Oklahoma

03. Fine Arts and Design

06. Theatre Arts

03.06.02  Lessac Centered BFA--Performance Program

Daisy Nystul,

University of Central Oklahoma

At the University of Central Oklahoma the Department of Theatre Arts incorporates Author Lessac’s work into voice, movement, and acting lesson plans. The training also enhances students’ personal lives by giving them the skills necessary to reduce stress, improve communication, and add to their overall physical well-being.

03.06.03  To Us, It Wasn’t Code; Decoding the Complexities of Collaboration

Kathleen Hardgrove,

Southeastern Oklahoma State University

The objective of this project was to build productive and mutually beneficial relationships between mentors and mentees. Mentoring requires collaboration between and across generation and levels of expertise. The Choctaw Nation of Oklahoma tasked Southeastern Oklahoma State University with the creation of a production to explore the history of the Choctaw Code Talkers of World War I. This collaborative project teamed faculty and student, elder and youth, artifact and technology. Using multimedia storytelling and digital technologies this project was able to negotiate the linguistic intricacies between English and Choctaw through the lens of the 21st century Choctaw college student. Through a variety of collaborative efforts the creative process that lead to the acclaimed performance of this original play at the Smithsonian's National Museum of the American Indian.
03.06.04 Adaptation and application of Medieval and Renaissance European Martial Arts Manuscripts for the creation of safe, non-violent, and tangible historical technique for replication upon the modern stage.

Erick Wolfe,

*University of Central Oklahoma*

Adaptation and application of Medieval and Renaissance European Martial Arts Manuscripts for the creation of safe, non-violent, and tangible historical technique for replication upon the modern stage.
04. Liberal Arts

01. Communication

04.01.01  Pretty Feet, Cupcake Dresses and Flippers: Destructive Competition on TLC’s “Toddlers & Tiaras”

Amy Aldridge Sanford, Molly Turner,

Northeastern State University

The TLC hit Toddlers & Tiaras premiered in 2009 and has featured hundreds of little girls and their families pursuing glitz pageant dreams. Annette Hill, director of the oft-featured Universal Royalty pageants, claimed she wanted her pageants to be a positive learning experience where contestants learned the meaning of competition. We argue that while young glitz contestants do learn about competition, it is often destructive competition. In short, one person must lose for another to win. Destructive competition takes four different forms on Toddlers & Tiaras: (a) competition between parents and children; (b) competition between siblings; (c) competition between contestants; and (d) competition between adults and children.

04.01.02  “Pimping Off the People”: Designing Lottery Legislation

Kristopher Copeland,

Northeastern State University

Many states have seen major declines in providing financial support for education and have found lottery policies as a means to generate additional funds for education. In this qualitative case study, interviews were conducted with 10 former senators to examine how decision makers socially construct target populations while forming lottery policy. Developed by Helen Ingram and Anne Schneider (1993), the social construction of policy design provides a framework for better understanding how social constructions become embedded into the political discourse from the policy design process. Interviewed persons noted that education became the primary beneficiary, while discussion centered on burdens being placed on those participating in the lottery, which were noted as mostly deriving from low-income households. Additionally, participants noted that burdens related to issues pertaining to gambling addiction and other social costs. These findings suggest that the social constructions derived in the policy design process have a lasting impact on the messages sent to those that are noted as “deserving” and “undeserving”.

04.01.03  Shattering the Glass Ceiling into Hillaryland: How Hillary Rodham Clinton Challenged the Double Bind with Transactional Feminist Leadership

Molly Turner,

Northeastern State University

Hillary Rodham Clinton is one of the most notable women in American politics despite some of the controversy surrounding her career. Part of the controversy was due to her non-traditional transactional feminist leadership style in partnership with her husband’s blended leadership style that guided their co-political career. Though she faced many barriers due to the double bind, like being judged too masculine because of her leadership style, then later incompetent, she challenged them with her unconventional view on politics and devotion to equality in public service.

04.01.04  A Health Care Campaign for Breast Cancer: An Early Detection Plan for University Students

Callie Carrrell,

Southeastern Oklahoma State University

In a health campaign project for a communication class, I propose to engage university students in an early detection plan for breast cancer. This campaign will include defining the situation and audience, establishing campaign goals, and selecting channels of communication. The current situation is the large number of women and men who will be diagnosed with breast cancer. For women, this number is one in eight. For men, 410 will die each year. The university targeted in this campaign has an enrollment of 3,805 students, which means 238 of the women from this university will be diagnosed with breast cancer. The projected change in behavior will involve the students conducting self-examination, receiving mammograms, and enrolling in classes. The communication channels will include utilizing mass media such as email to students and announcements in the university newspaper and radio programs. Communication messages in the email will include words in the subject bar such as “Do you have Breast Cancer?” A second channel would include utilizing a guest speaker who is a survivor of breast cancer. She will provide both logical and emotional appeals in her presentations. The final step of the campaign will be to determine the success of the campaign. An evaluation form will be completed by all who participated.

04.01.05  What I Would Do about Abusive, Harassing, and Hateful Speech on College Campuses: A Proposal

Nicole Murphy,

Southeastern Oklahoma State University

College campuses are grounds for enlightenment, breeding great thinkers for the future of American civilization. What happens, though, when abusive, harassing, and hateful speech infiltrates this glorious free exchange of thoughts and expression found on college grounds? Does the First Amendment protect this language? The purpose of this research is to survey what campuses are currently doing to face abusive, harassing, and hateful speech; evaluate the methods based on First Amendment interpretation; and discover the most responsible approach to educating students on the matter.
04.01.06 Real Men Don't Cry?: Public Apologies and Its Symbolic Meanings in Taiwan

Hsin-I Sydney Yueh,

Northeastern State University

Taiwan is the island of sajiao. This metaphor serves to highlight the prevalent culture of “passive persuasion” in Taiwan. This specific persuasive form discussed in this paper refers to a set of actions that involve the imitation of a child's gesture, pronunciation, and movements. The emphasis of the childish behavior and the expression of one’s weakness to persuade others are contrast to many other cultures in terms of the conceptualization of personhood (e.g. the persuader should be trustworthy, responsible, and reliable). The prevalence of sajiao phenomenon is supported by previous ethnographic research on language practice in Taiwan. The fact that the native term for talk, sajiao, can be heard in countless conversation, referring to the set of childish persuasive action conducted not only by women, urges researchers to adopt a more critical framework in examining the cultural practice. For example, male public figures in Taiwan are often caught in tears when they apologize in the press conference. However, it does not mean that crying in public is encouraged in this culture. Thus, the frequent use of crying in front of a camera while giving a public speech signals a culturally situated value about personhood and communication. Examination of the sequential organization of such speech would enable a closer view of the culture and the symbolic meaning derived from the specific scene.

04.01.07 Channel One: Assessing the Quality of Adolescent News

David Scott, Mike Chanslor,

Northeastern State University

Over the past thirty years private for-profit corporations have played an increasingly significant role in common education (Ford, 2010). School districts facing budgetary constraints have entered into a variety of agreements that allow corporations to disseminate commercial-based messages to their students in return for equipment or other compensation. Since many schools are unable to afford the cost of new equipment, technology, and instructional materials, they have been receptive to corporate partners (Alper, 2003). One of the more notable examples of the increased corporate presence in the classroom is “Channel One News.” However, a key issue is the overall journalistic quality of the program. The cumulative data seems to suggest that Channel One's “captive audience” model of news production does not result in higher quality journalism as measured in traditional social responsibility terms. It would also appear the potential of Channel One News to address deficiencies in current event knowledge and civics has been compromised to some degree by the overall commercial emphasis of the program. Arguably the data produced from this study makes a strong case that CNN Student News could be a better choice for students. However, in terms of overall news story types, there does not appear to be a large substantive difference between the two programs, but Student News has considerably less commercially related content embedded within the newscast itself.
04.01.08 Exploring News Media Contributions to Political Attitudes

Ashton Faries, Aubrey Tarantine, Paige Throneberry,
Southeastern Oklahoma State University

Using the 2008 National Annenberg Election Survey, this research examines the relationship between different news media and people's perceptions of political efficacy. Using multiple regression analysis, it was found that accessing online information and watching television for information about the 2008 presidential campaign were strongly associated with "feeling that politics is too complicated." This research also found a significant relationship between access to the Internet and "feeling that politics is too complicated" and "people like me have no say over government."

04.01.09 Exploring News Media Contributions to Political Participation

Tyler Slawson,
Southeastern Oklahoma State University

In examining the 2008 National Annenberg Election Survey, this research explored the relationship between media consumption and discussing politics, and voting in the last general election. After conducting a multiple regression analysis, it was found that watching television for political information and watching the Daily Show or Saturday Night Live were strongly associated with political discussions, while reading a newspaper was strongly associated with voting in the last general election.

04.01.10 Argument Quality: An Examination of The Washington Post's Pulitzer Prize Winning Journalism on The Democracy Exportation Project in Yemen

Melissa Haworth-Cox, Brittani Young,
Southeastern Oklahoma State University

This analysis focuses on David Finkel's articles on the Democracy Exportation Project in Yemen, which were written for the Washington Post in 2006. These three articles won a Pulitzer Prize in Explanatory Reporting. This analysis finds the author focused on emotional elements in the story to elevate traditional forms of evidence, such as authority, example, and analogy. In doing so, the reader has a stronger attachment to the Sheiks who desire to end tribal violence in Yemen.
**04.01.11** 1980s: A Timeline of Better Home and Gardens Advertisements featuring Cigarettes

Hope Zachary, Clint Byley, Katie Rings,

*Southeastern Oklahoma State University*

In this collection of ten cigarette advertisements collected from the May editions of Better Homes and Gardens magazine, we argue, in a beginner’s “infographic,” that cigarette brands reached out to men and women, while suggesting “sexuality” and “ruggedness.”

**04.01.12** 1970s: A Timeline of Better Home and Gardens Advertisements featuring Lysol

Haley Ellison, Paige Adams, Paige Throneberry,

*Southeastern Oklahoma State University*

In this collection of nine Lysol advertisements from the April editions of Better Homes and Gardens magazine, we show these advertisements focus exclusively on Caucasian women, and their responsibilities in a family household. Noticeably absent from these advertisements are men, and minorities.

**04.01.13** Argument Quality: An Examination of the Boston Globe’s Pulitzer Prize Winning Journalism on Stem Cell Research

Jordan Hedrick, Chelsea Neal,

*Southeastern Oklahoma State University*

In this series of Pulitzer Prize winning articles, Gareth Cook introduces the reader to the controversial issue of stem cell research. These stories were written during 2004 when stem cell research was a particularly heated, and contested issue. Cook presents his arguments affirming stem cell research by connecting with the audience emotionally, and by using logical evidence. The central argument is while there are ethical questions surrounding this issue, there is potential for stem cell research to bring healing and prevention of human disease.
04.01.14  Argument Quality: An Examination of The New York Times’ Pulitzer Prize Winning Journalism on Food Safety

Evan Wakefield, Callie Carrell,

Southeastern Oklahoma State University

In these ten articles, Michael Moss explores the issues of tainted meat, the meat industry, and government regulation of the food industry. Combining statistical evidence with the introduction of people (characters) harmed by tainted meat, Moss presents an effective narrative to offer explanation of the industry and creating reader engagement. This analysis explores this narrative and concludes that storytelling, and not quantitative evidence, is central to these articles’ explanatory power.

04.01.15  Managing Change: Faculty Perceptions of a Transformative Learning Initiative

Danielle Hernandez, Christy Vincent,

University of Central Oklahoma

While many theories address the topic of change management, an organization’s ability to integrate changes effectively still presents a significant challenge. The myriad of perceptions of the organizational members contribute to their responses when they learn of planned changes in the organization. Using Everett Rogers's (1983, 1995) Diffusion of Innovations theory as the foundation, this research sheds light on the integration of initiatives into organizations. Specifically, this paper describes faculty members’ responses to a major change initiative—Transformative Learning (TL)—at a local university. The research questions concern faculty members’ 1) understanding of the TL initiative; 2) level of adoption of the TL initiative; 3) implementation of transformative learning; and 4) perceptions of benefits and barriers of the TL initiative. A series of in-depth interviews with several faculty members provided answers to the research questions. There was neither consensus among the participants on the purpose of transformative learning nor on best practices for its application. Responses ranged from positive—willingness to embrace TL but uncertainty regarding incorporating it into the classroom—to negative—complete rejection of the idea of transformative learning. Results of this study provide information that may help university leaders focus their change management efforts and address the issues that hinder the im
04.01.16  Analysis of Barack Obama’s 2013 Inaugural Address (Through the Lens of Dramatism)

Troy Ward,

Southeastern Oklahoma State University

The purpose of this rhetorical analysis is to apply the concepts of the dramatic pentad created by Kenneth Burke to uncover the motives of persuasive speakers. In my analysis of Obama’s 2013 Inauguration speech, I argue he uses the pentads to motivate the audience. I argue his philosophy and intentions are that a collectivistic American culture can face today’s challenges. I also argue that the most obvious pentad used by President Obama is “agent.” This pentad is described as the person or people who performed the act. Throughout the speech, he referred to “we” many times creating a sense of unity as American people. He used “we” as a “God Term,” in which all other positive terms are subservient to it and promote America as a collectivistic culture. Another dominant pentad is Obama’s references to the “agency” pentad, which is the method to accomplish a deed. When he recited “we will defend our people and uphold our values through strength of arms and rule of law,” he revealed a method of achieving unity through our constitution. A third dominant pentad used by Obama is “scene.” For Obama, the scenes are the historical context and the realities of our time. His references to these revealed his argument that all men and women are created equal both in the eyes of God and the law. I conclude his motives are to heal the bitter divisions created during the election campaign and

04.01.17  A Health Care Campaign: Preventing the Spread of Disease in the Workplace

Kristi Ryan,

Southeastern Oklahoma State University

The purpose of this project conducted in a health communication class was to motivate employees to use hand sanitizers to prevent the spread of disease in their workplace. The organization used for this campaign was an outsourcing provider to help businesses manage customer relationships. The health care problem and target audience were identified through observations of workers’ behavior, interviews with workers, and other studies conducted in this workplace. These research steps identified a problem that stems from a time constraint that prevents employees from keeping their hands clean after utilizing the outside break area. Based on this research, the first activity of the campaign was gaining approval from management to install hand sanitizer dispenser outside employee break areas. A communication message used in the campaign became the label for this area: The AHS station for antibacterial hand sanitizer station. Campaign messages on posters were placed by doors for re-entering the building. The employee newsletter was also used to promote the use of the AHS stations. Another activity of the campaign involved having maintenance personnel to clean door handles twice daily. The final activity of the campaign was receiving information from the managers about the percentage of employees who are absent to illness. The result of the campaign is that absences decreased.
Cultural Strategies of Organizing: Secondary Socialization for Organizations in the 21st Century

Christopher Rudick,
Northeastern State University

Recent developments in the economic condition of world markets have prompted many organizations to overhaul their public image. While many of these recent tactics are public and highly visible, some strategies are ongoing focus internally and hinge more on the creation and maintenance of organizational culture via the employee socialization process. The creation of these cultures generally serves to fulfill a proximal goal in earning the trust of their clients and the public in general via the representations of bank employees and the terminal or ultimate goal of success and profitability. This paper examines the value appeals utilized in the employee handbook of a Midwestern bank by using a rhetorical cluster analysis. It attempts to deconstruct the language used in order to discover more about the creation of this particular organizational culture through the socialization of new employees and image management strategies. Ultimately, this document is highly suggestive of a planned strategy to socialize newcomers into the beliefs of the organization.

A Health Care Campaign: Combating Diabetes in the Native American Community

Troy Ward,
Southeastern Oklahoma State University

The goal of this project conducted in a health communication class is to raise awareness about the risks of diabetes among elderly native people and present them with alternate behaviors. Within most Native American communities across the United States, diabetes has become an epidemic. According to Indian Health Services, this number is even higher in the elderly community. The targeted audience for this campaign is the elderly community of Choctaw Indians in Bryan County, Oklahoma. The main objective of this campaign is to inform the target population about types of foods that causes diabetes and provide them with motivation to discontinue consumption of them. One activity of this campaign included a set of oral presentations given in a location where many Choctaw Elders congregate. Messages in the campaign included appeals to their sense of community and respect for leaders. An example of a message is “help keep our community strong and vital by supporting each other in monitoring sugar intake and checking sugar levels.” Native Americans have a strong sense of community and appealing to what is good for the community had a strong effect. Other messages about modeling behavior that will teach the children the right way was also effective in adding emotional appeal. Interviews were conducted to ascertain the campaign’s effectiveness. Awareness of risks of diabetes to Native Americans was achieved.
04.01.20  She is Not Good Enough: Media Beauty in College Students' Eyes

Ekanem Ekpenyong,
Cameron University

This research focuses on college students' perception of beauty, which in the media is usually associated with certain characteristics including skinny, long hair, and light skinned. In an effort to see beauty through the eyes of students, interviews were conducted with different college students aimed at explaining and understanding what they think beauty is and if it corresponds to what the media defines beauty to be. The findings show: 1) most of the students say that beauty for the most part comes from the inside; 2) most of them agree that the media plays a role as to how the public perceives beauty; 3) students expressed concerns in regards to the media's influence on how people think about beauty; and 4) all students agreed that beauty is flexible and has different meanings.

04.01.21  Problem-Based Learning: The Three Valley Museum as the Public Relations Classroom

Shannon McCraw,
Southeastern Oklahoma State University

Problem-based learning has long been used in teaching professional programs, but limited research exists exploring PBL’s success in teaching public relations. Through a partnership with the Three Valley Museum in Durant, public relations students are developing a comprehensive strategic communication plan for an 18-month campaign. This poster discusses the museum’s problem-set, while proposing an exploratory study focused on problem-based learning and student self-reports of student engagement, student satisfaction, and student perception of learning.

04.01.22  Deepwater Horizon: A Criticism of BP's Response

Colton Rowe,
Cameron University

The purpose of this paper is to criticize British Petroleum's response to the events of April 20, 2010, and the subsequent oil spill. The main focus of this paper is Tony Hayward's testimony before Congress on the morning of June 17, 2010. Focusing on Hayward's testimony not only provides speeches of accusation and defense to analyze, it simplifies the critical process, as indeed, most of the accusations leveled against BP corporately were addressed before congress, and in Hayward's testimony. I will categorize BP's apology in terms of literature provided by Halford Ryan, Ware and Linkugel, and I will evaluate their response in light of research provided by Millar and Beck.
Fred Rogers, better known as Mr. Rogers, did not seem like a fighter. His television show, Mr. Rogers’ Neighborhood was renowned and loved for his insightful, soft spoken ways. But in 1969, Mr. Rogers went before the senate and fought. The stakes were the future of public access television funding, and Mr. Rogers brought the greatest weapon imaginable: rhetoric. Mr. Rogers exemplified what made his show different from the other shows in the television "wasteland." By placing his argument in a larger context, Mr. Rogers not only defended his show and the future mental welfare of children, but by extension, the future of America. He also depicted himself as the kindly guide to that future. This analysis uses the literature of Halford Ryan and Ware and Linkugel to examine Mr. Rogers' speech.
04. Liberal Arts

02. English

04.02.01 American Indian Literature: The Emerging, Established, and Iconic Voices of Generation X

Timothy Petete, Shay Rahm-Barnett,

University of Central Oklahoma

The Native American Renaissance (c. 1968-92) is an era noted for the proliferation of American Indian literary authorship. Writers such as Louise Erdrich, Hanay Geiogamah, Joy Harjo, N. Scott Momaday, and Leslie Marmon Silko transformed genres, produced masterpieces, garnered international interest, and heightened expectations. These authors, along with dozens of others, laid the groundwork for the next generation of American Indian scholars, novelists, poets, dramatists, fictionists, and filmmakers. Generation X writers (born in/since 1965) include Sherman Alexie, Mandy Smoker Broaddus, Natalie Diaz, Jennifer Foerster, Santee Frazier, Stephen Graham Jones, Beth Piatote, Cynthia Leitich Smith, David Treuer, and Daniel H. Wilson. In terms of purpose, style, and content, some have elected to write in the manner of their predecessors, whereas others have adopted a different approach. In each instance, their rationales are based on several conditions, including artistic tendencies, contemporary technologies, social and political climates, and adapting markets. This ongoing research project has produced several scholarly, teaching, and service activities.

04.02.02 Necessary Authorship: Examining Michel Foucault's Author-Function Theory and Go Ask Alice

Lindsey Huckaby,

Cameron University

In contemporary literary studies, definitive authorship is often taken for granted. We hardly question the interpretational value of authorship, and it is only when we are confronted with the absence of an author in a literary work that we begin to consider the author’s name as necessary. Michel Foucault’s essay, “What is an Author?” offers the theory of the author-function, examining the relationship between an author and his or her work, as well as the interpretational effects of that relationship. By selecting the fairly well-read and anonymously published novel, Go Ask Alice, we can evaluate the ways in which modern authorship is taken for granted, as well as clearly explain the necessity of the author and his or her relation to our interpretation of the novel. Foucault’s theory insists that readers demand authorship in order to classify a work based upon its relation to its author, assign culpability to an individual responsible for the work, authenticate the value and meaning of that work, and gauge that individual’s creativity.
04.02.03 Literary Archetypes: the Relationship of Gilgamesh and Enkidu

Wesley Jones,
Cameron University

My objective in this research is to examine the various characteristics of literary archetypes from the most ancient to more modern versions. Therefore, I will show how many modern heroes are based on antiquated archetypes which arise in the earliest of civilizations. However, my primary focus is on the tale of Gilgamesh, specifically the relationship between Gilgamesh and Enkidu. I believe that there are key differences concerning this relationship which make Gilgamesh and Enkidu unique among epic heroes. At the same time, I acknowledge that Gilgamesh is the original archetype for a hero. In order to prove my hypothesis, I will study the epic of Gilgamesh, as well as the tales of other archetypal heroes, while drawing evidence and inspiration from different sources concerned with the examination of heroes. Finally, I will show how Gilgamesh and Enkidu differ from all other archetypal heroes, and that the basis of this difference lies in the nature of their relationship.

04.02.04 Reading in Girl Scouts Affiliated Public Housing Sites

Alexandra Bohannon,
University of Central Oklahoma

Literacy is an important issue in most educational circles in the 21st century. With so many distractions in our society, what are ways to motivate children to pick up a book? This study examines a specific population of children—females living at Girl Scouts affiliated public housing sites—to determine if incorporating literacy materials with Girl Scout curriculum will increase motivation to read for these girls. The girls will be surveyed and the facilitators of the program will be interviewed to see if there is a change in their motivation and attitudes towards reading. The larger implications of this survey can determine if specifically targeted literacy programs will help children desire to read more as well as contribute to future research on similar topics.

04.02.05 Alexander's Excellent Adventures: An Examination of Cultural Influence on Adaptations of “The Romance of Alexander”

Rose Welch,
Cameron University

The Romance of Alexander is a collection of myths and legends surrounding the exploits of Alexander of Macedonia, which were rewritten repeatedly during the 4th through 16th centuries in many languages, including Greek, Latin, Hebrew, and a variety of European vernaculars. The Romance of Alexander changes in each cultural setting as different parts of the story are emphasized, along with the accompanying art, in a variety of ways. Due to its popularity and prevalence, the Romance of Alexander is a good touchstone to examine the differences between these cultures. This is a survey of different versions of the tale, with emphasis on three key areas of study: (1) those parts and sections from the original story which are included, (2) the editorial changes in those parts, and (3) the changes in the artwork. The survey uses an empirical-analytical methodology by gathering archival research created by highly regarded resources, including professional journals and books.
A major theme in the Harry Potter series by JK Rowling is good versus evil. The protagonist and antagonist play a major role in developing that theme. It is useful to examine why good triumphs over evil in this particular case. The objective of this research is to better understand the Hegelian Master-Slave dialectic itself and how it applies to the Harry Potter series. The thesis is two-part: 1) Applying the Hegelian dialectic to examine the relationship—and struggle for power and recognition—between the protagonist and antagonist opens a new door in understanding why the series is so compelling to many readers. 2) Considering the dialectic, it is clear that the antagonist attempts to live above the system of the dialectic which leads to his defeat. The method of this research was three-fold: 1) Study the source text of Hegel’s work, Phenomology of the Spirit. 2) Study the source texts of the Harry Potter series and the relationship between Harry and Lord Voldemort within those seven novels. 3) Applying the major concepts of Hegel’s dialectic to the novels. The findings of this research are that the key tenets of Hegel’s Master-Slave dialectic are applicable to the series itself, in general, as well as the protagonist-antagonist relationship, in specific. The dialectic illuminates why Harry Potter was successful, through the framework of the dialectic, and why Lord Voldemort was defeated, through taking the dialectic for granted in his quest for absol.
04. Liberal Arts

03. Ethnic Studies

04.03.01 Chinese Tea and its Culture

Athena Gonzalez,

Cameron University

When thinking of Chinese culture, Chinese tea is one of its important cultural icons that come to mind. From its ancient times to modern life, Chinese tea plays an important role in the lives of Chinese people. With four major tea types (black, green, oolong, and white) stemming from the same plant, anyone can enjoy a cup of Chinese tea that suits their preference. Not only does tea serve as a relaxing, warm beverage, but it can also benefit the drinker's health. As the Chinese culture evolves, the significance of having tea also increases. Through conducting both primary and secondary research, this study further examines the important roles tea plays in Chinese culture and its many functions in modern life. The personal interviews with native Chinese citizens have provided a deeper understanding of the social aspect that tea exhibits in modern life such as symbolizing togetherness and harmony, functioning as a medium in which people communicate ideas and spend valuable time with one another. The library database research also has produced rich findings in authentic visuals of Chinese tea, its long history, its medical values, and its entertaining functions.
04. Liberal Arts

04.04.01 Changing lives through short-term study abroad. A transformative experience?

Maria Teresa Moinette,

University of Central Oklahoma

Study abroad continues to occupy a position in the educational field as a positive venue to traverse borders and learn to live with individuals in a society that is not one’s own (Michelson, 1999). The desire to create more opportunities for students to study abroad has led to a shift in higher education for programs that can accommodate the needs of students of the 21st century. One option is to offer shorter stays abroad in order to allow for the international experience in an academic setting, while enabling students to graduate in four or five years. The growing number of short-term participants in study abroad suggests that the trend will continue. Yet, the research into this arena remains scanty. Whereas research demonstrates that long and mid-term study abroad have educational, personal, and academic value, the impact of short-term study abroad and the educational value of such a sojourn remains, largely, a mystery.

04.04.02 La Salle de Classe sur scène: Evolving cinematic depictions of French schools.

Catherine Webster,

University of Central Oklahoma

The objective of this research is to determine how the cinematic depiction of French schools and instructors has changed over the course of the past century. As French society has become more open to class mobility and diversity, these changes are similarly reflected through depictions in French film. A longitudinal study of French cinema, from the early sound period (Jean Vigo’s Zéro de conduite) through 2008’s Entre les murs and touching on several versions of Topaze, Louie Malle’s Au revoir les enfants, as well as Les Choristes and a number of films set in contemporary school settings: Être et avoir, L’esquive and L’École pour tous. The sheer number of these recent films suggests a great interest in the topic and the vivid transformation of the French classroom. Detailed analysis of these films yields historically relevant commentary on social class and pedagogical attitudes.
04. Liberal Arts

05. Geography

04.05.01 Discourses of the Mother Road: Geographic Themes Along Eastern and Central Route 66

Adam Payne, Douglas Hurt, Sara Hawk,

University of Central Oklahoma

Connecting Chicago to Los Angeles, Route 66 is a symbol of American history as well as an economic resource for local communities and individuals who have opened a series of museums and interpretive sites near the highway. In order to explore what cultural heritage images Route 66 tourist sites convey to visitors, we assessed the information presented at museums and historic sites astride Route 66. Our preliminary qualitative analysis suggests similar and unique ways that the American past is viewed in the eastern, central, and western portions of the route.
04. Liberal Arts

07. History

04.07.01 Hyphenated Citizen: How American Federation of Labor Organizer Clemente Idar Fought for Labor and Citizenship Rights for Mexicans and Mexican Americans in South Texas, 1918-1934

Stephanie Diaz,

*University of Central Oklahoma*

Based on primary research conducted at the University of Texas, this paper explores Clemente Idar’s career as a general labor organizer for the American Federation of Labor (AFL) and his work on behalf of Mexican nationals and Mexican Americans in the borderlands of Texas and Northern Mexico during the early 20th century. Originally from Laredo, Texas, and fluent in English and Spanish, Idar came from a large Mexican American family of activists shaped by the social and geographical ramifications of the Mexican Revolution. His father, Nicasio, gained regional notoriety for his newspaper, La Cronica, and his involvement in El Primer Congreso Mexicanista of 1911 brought Clemente, to the attention of Samuel Gompers as a potential employee able to walk between two worlds. Idar’s rise to fame was quickly stalled, however, by the relationships between the Mexican Revolution & American Labor; Mexican & US governments; and the relationship between the AFL & US government.
04.07.02  Women's Lives in New Netherland

Megan Stockton,

_Cameron University_

Historians have studied New Netherland's history, but they have too often ignored a certain group of people: the women of the colony. My research focuses on women within the colony during its existence from 1624 to 1674 and mainly on how the women of New Netherland lived, the laws that ruled them, and their status within the society. The point of this research has been to establish the liberties which the women of New Netherland received and what they did with those liberties. The project reveals that women in New Netherland were men's commercial and economic equals in many ways, but they were men's inferiors when it came to public matters, such as access to public authority. The methodology used to exhibit this thesis was based chiefly in analyzing representative samples of certain kinds of conduct from the court records of New Amsterdam and Fort Orange. In general I searched through court cases to find cases of women using their liberties. To realize fully the meaning of these court cases, I also relied on a qualitative study of the laws and ordinances of New Netherland. While the colony of New Netherland was patriarchal in nature, women were able to gain an education and, because of that option, were able to be a part of New Netherland's economy and could join in many different occupations. They also had property rights and could defend themselves and their families in court. Yet, women were still made to act in a certain way compliant to men.

04.07.03  Decolonizing the Histories of Helen Hunt Jackson (1830-1885) and Gertrude Simmons Bonnin (1876-1938)

Barbara Bilek,

_University of Central Oklahoma_

What is decolonization and how does it work? The concept of decolonization surfaced during "the global Indigenous activism in the 1970s." Although the idea is not new, it has been given little attention by mainstream western historians. In Native Historians Write Back, Susan A. Miller, and James Riding In, stated, "Decolonization is a process designed to shed and recover from the ill effects of colonization." In this thesis, I utilize the case studies of two women to demonstrate how decolonizing history using an Indigenous lens can construct a new history producing a new narrative with a different perspective. Many literary scholars studied the lives of Jackson and Bonnin, but their work has been largely overlooked by western historians. This researcher saw the women as the progenitors of the modern day Native American rights movements. The object of this research project was to use an Indigenous perspective to observe and report whether the histories about Jackson and Bonnin would change as a result. The results have produced a manuscript that provides an example of how to apply the principles of Indigenous discourse, specifically regarding decolonization. Decolonizing the history of two very different women with synchronistic goals may encourage other historians whether Native American, western, or American to present alternative perspectives in the histories they write.
2012 Oklahoma Civic Health Index: Civic Skills and Voter Education

Alyce Vigil, Danielle Hernandez, Janelle Grellner, Lauren Craig, Patti Loughlin,

University of Central Oklahoma

A research team from the University of Central Oklahoma’s American Democracy Project, Oklahoma Campus Compact, and the National Conference on Citizenship produced the first Oklahoma Civic Health Index in 2010. We examined the civic health of Oklahoma by looking at five indicators of civic health: volunteering and service, political action, social connection, belonging to a group, and working with neighbors. Building on the first report’s findings, the 2012 Oklahoma Civic Health Index concentrates on civic skills and voter education, including Oklahoma politics and citizen engagement. The report includes new measures such as trust, confidence, online engagement, and local voting. The key findings of the report are as follows: 1. The road to engagement could start at the dinner table, but it doesn’t. 2. Oklahomans’ hearts beat strong for volunteering. 3. We don’t talk about politics nor do we frequently engage in political acts. 4. Confidence in public institutions is moderate in Oklahoma and across the nation. 5. Oklahoma civic skills are on track to improve. The report will be shared with policymakers, educators, community agencies, city planners, universities and other community partners to promote and facilitate engaged community conversations.

The Big Break: Race and Gender in Pawnee Bill’s Wild West Show, 1888-1913

Alyce Vigil,

University of Central Oklahoma

Gordon William “Pawnee Bill” Lillie’s (1860-1942) Historic Wild West was in operation from 1888-1913. Wild West shows were the unofficial national entertainment of the United States and attempted to teach Euro-Americans about life on the western frontier. Much has been written regarding Buffalo Bill Cody and his show, the first of these enterprises. Academic writers, however, have largely neglected Pawnee Bill’s show. We cannot truly understand Wild West shows unless we explore more than one incarnation of it. Similarly, we cannot truly understand any one Wild West show unless we explore all of its participants—not only the Euro-American men, but men and women of ethnic minorities whose voices have so far remained silent. After conducting extensive secondary and archival research, I argue that, whether show organizers or audiences realized it, involvement in Pawnee Bill’s Historic Wild West provided social, cultural, and economic opportunities for three previously marginalized groups. Euro-American women showcased their strength and independence by traveling without male chaperones, wearing split skirts, and doing a man’s work. American Indian women hid their traditions in plain sight at a time when they were threatened by the reservation and boarding school systems. Finally, Georgian men and women earned more money than they ever could in their civil war-torn country and sent it home.
04.07.06  Gold Dust Sisterhood: The Shadowy World of Prostitution in Mining Towns of Southwest Colorado, 1880-1920

Sherri Duncan,

University of Central Oklahoma

Building on the work of historian’s Ann Butler, Duane Smith, and Alan Bird, Gold Dust Sisterhood examines prostitution in mining towns of Southwest Colorado focusing on their unmistakable contributions to the development of frontier society. After the Pikes Peak gold rush in 1858, immigrants flooded the Rocky Mountains establishing overnight boomtowns. During this brief phenomenon of rapid growth, an intricate stratification pattern developed reflecting differences in class, race, and sex. Prostitutes and madams flocked to these temporary towns of riches becoming engaged in the trade that eventually shaped the town’s reputation and geographical layouts. This work includes primary sources from the Animas County Historical Society, San Juan Historical Society, and the Center for Southwest Studies. Newspaper articles revealing conduct and arrest, and death notifications of prostitutes were taken from the La Plata Miner, The Silverton Standard, and the Durango Democrat. Today, tourist visit mining towns of Durango and Silverton, Colorado to experience the days where just-paid boisterous miners relived the boredom of long days in the mines with the company of frontier prostitutes. Their streets are lined with an ever present reminder of how thousands of women who worked the steamy brothels and saloons shaped social landscapes and contributed to their development. Sherri Duncan, Graduate student, University of Central Oklahoma Dr. Patti Loughlin, Faculty Advisor

04.07.07  The Barefaced Tory: Sir Dudley North and the Consolidation of Monarchical Power

Suzanne Farmer,

Northeastern State University

The consolidation of monarchical power throughout the 1680s is often viewed at best as arbitrary. However, this was not a universal sentiment among contemporaries. Not all citizens who engaged in the political arena were necessarily opposed to Charles II or James II’s grabs for power, even in London, the opposition’s stronghold. Tory Sir Dudley North entered the political sphere as an agent of the Crown in the controversial London shrieval election of 1682. As sheriff, North actively worked to quash opposition to the Crown within the City of London. Throughout his short political career, North continued to act in a manner that upheld both Charles II and James II’s attempts at personal rule. North is most famous for his role in selecting the juries that tried and convicted Rye House plotters, including William Lord Russell, and Algernon Sidney, but these were not his only acts at aiding the Crown to consolidate its authority. One of North’s last political actions was his efforts to ensure that the Crown was so financially stable that Parliament would be rendered unnecessary. This paper will argue that North, as a Tory ideologue, was working to strengthen the reigns of monarchs who were attempting absolutist regimes. By examining North’s Parliamentary record and his acts as Commissioner of the Customs, this paper argues that North, as a Tory ideologue an agent of absolutism, was working to strengthen the reigns of monarchs who were attemptin
In October 1944, the US 7th Army pushed German Army Group G out of Southern France and into the Vosges Mountains. The Germans held the Americans back until the end of January 1945. In 1994, Historian Keith Bonn wrote the first history of the Vosges Campaign in When the Odds Were Even. In the book, he made the argument that the two sides were evenly matched; however his thesis is flawed in that the odds were not even. Reviewing American and German archival sources found that the Germans were attempting to delay the 7th Army’s advance through the Vosges. The Germans were retreating towards the Rhine River and using the mountains to slow down the Americans. The Germans relied heavily on roadblocks, mines, barbed wire, pill boxes and small engagements. They only used offensive assaults when the Americans tried to progress out of the mountains, and this was only done to push them back into the Vosges. The German supply records clearly show that Army Group G was in desperate need of supplies and were outmatched by the Americans. The 7th Army also had superior manpower and a larger reserve of manpower than the Germans. The study used divisional records from the 45th Infantry Division, regimental reports from the 45th and 36th Infantry Divisions and German reports, including Army Group G’s supply records for the time period.
04. Liberal Arts

08. Political Science

04.08.01 Americans at War: The Political Impact of Photography

Tarron Vogt,

East Central University

Does war photography make people feel differently about war? The poster will feature pictures of every war starting with the Civil War through the War in Iraq. The research will explain how photography changes how the American people feel about war.

04.08.02 Local Election's Fight Against Low Voter Turnout: The Battle of Ada

Marsha Coyle, Stephen Vines, Will Irwin,

East Central University

When we think of small towns, we picture close knit communities where everyone knows everyone and issues are resolved with group effort. This is Ada, Oklahoma. But Ada has one problem that has not been addressed, low voter turnout. The purpose of this study will be to find out why voter turnout is so low and how this correlates with satisfaction of the municipal government. If citizens are not giving the government feedback, then how does the municipal government know what the needs are of the citizens? We will use surveys to measure satisfaction of municipal government and compare the results. Our hypothesis is that communities with higher political participation are more satisfied with the municipal government and when political participation is low the needs of the citizens are not met. Our end goal is to provide insight into the correlations between political participation and municipal satisfaction. Possible outcomes could include policy suggestions for the City of Ada and similar townships across Oklahoma.
04.08.03 Native American Indian Women In Tribal Politics

Donna Iti Tupa,
East Central University

Historically, Native American Indian Women have been consulted by tribal leaders; however, in modern society and politics their opinions and influence have decreased. The research will aim towards cause and effect Native American Indian Women in leadership position within tribes.

04.08.04 Icumbency: How The Delegate Becomes a Trustee.

Wesley Robertson,
East Central University

How does the incumbency status of a United States Congressman affect the role he or she plays in representing his or her constituency? I hypothesize that after the third consecutive re-election, members may change from more of a delegate role to their constituency to a trustee role. This is demonstrated by how sensitive he or she is to the constituent desire despite whether it is in the best interest of the constituency. Most research that looks at the incumbency effect shows the relationship between re-election and incumbency advantage. My research contributes to the body of knowledge by showing how the behavior of the elected official can change, be tolerated, and even respected based on a track record that is considered “proven” by the people that vote.

04.08.05 Little Miss vs. Mr. Man: A look at Women and Men in the Media During Congressional Campaigns

Kaylin Cullum,
East Central University

Women face much different social scrutiny when running for public office than men do. They are hounded with questions very different than their male counterparts, including focus on apparel and overall style as opposed to a stance on the issues. This paper will study the effect of media portrayal of women who run for congress in three states: Oklahoma, New York and Pennsylvania. A number of stories on women verses men running for congress will be compared through content analysis to determine the differences, if any, in questions asked, issues focused on and over all media portrayal. Also studied is how female politicians react to the media attention, and whether it helps or hinders their campaign. Finally, it looks at how the media attention affects the voters, in a positive or negative way.
04.08.06  Education and Politics: The Battle Against Information Technology

Stephen Vines,
East Central University

Information Technology is often oversold and underused in schools. Is this because the resources aren't provided for schools or are our schools refusing to adopt Information Technology? The purpose of this study is to take a detailed look into the use of Information Technology in the classroom and the availability thereof. Through a series of interviews and surveys of educators, I will sample how often Information Technology is used in the classroom, and then attempt to find out if it's enough or too much. I will then compare the results to nearby states to see if the State of Oklahoma is providing enough resources for Information Technology in educational institutions. My hypothesis is that the State of Oklahoma does provide enough financial resources, but not enough training and policy support. My goal is that the end product will provide insight into how Information Technology is used in the classroom and how the Department of Education can better implement Information Technology in the classroom.

04.08.07  How Politics and Corruption Affect Society: A Comparative Analysis

Elis Matoshi,
East Central University

Politicians all over the world possess prestige, authority and power. It's true that politicians make laws and regulate people's lives. However, many times politicians have been accused of corruption and misuse of duty. Corrupted politicians are a huge issue in every society, they cause economic decline, the increase the criminality, and create chaos in every country. I hypothesize that increasing politicians' wages and creating laws that punish corruption will be a huge step in curbing corruption.

04.08.08  The Thirteenth Juror-the Impact of the Media on the American Criminal Jury Trial System

Dan Brown,
Southwestern Oklahoma State University

THE THIRTEENTH JUROR- will examine the influence of the media on the American Jury System as it relates to criminal trials. While the SIXTH AMENDMENT of the United States Constitution guarantees that a defendant receive a fair trial by an impartial jury, this presentation will examine several specific cases where the National Media (tv, magazines and newspaper) have negatively impacted the jury trial process to the extent a fair trial did not occur. The presentation will conclude with specific recommendations to alleviate the problems associated with the media negatively impacting jury trials in the future.
04.08.09 The Use of Precedent in US Supreme Court Oral Argument

Iva Asllani,
East Central University

The Legal Model postulates that court decisions are based on the facts of the case in light of the legal precedents. The Attitudinal Model claims that the court decisions are based on the facts of the case in light of the ideological attitudes and values of justices. One way to test whether the Legal Model or Attitudinal Model is correct is to examine how legal precedent is used in US Supreme Court oral argument. Based on preliminary research it seems that today there is a decline in the use of legal precedent and Supreme Court oral arguments are based more on policy and hypotheticals. To test my hypothesis I will randomly select 20 cases each for the years 2000, 2005 and 2010 and review the oral argument transcripts. From the oral argument transcripts I will tabulate the number of cases and which cases are cited. After I note the cases cited in the oral argument I will examine the final opinions to see how many of the same cases are cited.

04.08.10 Canton Lake: Legal Contract vs. Moral Compass

Will Robinson,
Southwestern Oklahoma State University

Canton Lake is a key part of the economy of Northwestern Oklahoma, and now it has been reduced to a puddle. Oklahoma City has the legal right to a portion of the water held at Canton Lake, but does it have the moral right to withdraw the water knowing the damage that will occur not only to the lake itself, but to the surrounding communities as well. I will give specific details of the ecological damage that will be done by the withdraw of water, the possible impact on the economy, as well as the continuing conflict between rural and urban in this situation.

04.08.11 The Impact of Private Prisons in Oklahoma

Darral Roark,
Southwestern Oklahoma State University

Private Prisons were first proposed in Oklahoma in the 1990’s by former Governor Frank Keating. The original idea was to provide more capacity to house inmates for the Oklahoma Department of Corrections. Since the 1990’s six private prisons have been established in Oklahoma. Of these prisons only three currently house Oklahoma inmates, two are vacant, and one is contracted with the State of California. This presentation will examine the legal and social issues created by the emergence of these private prisons.
04.08.12 Teacher's Opinion Repression And Its Implications On Students' Political Ideology

Ibrahim Nour, East Central University

Nowadays a majority of college students are not involved in the political process of their states or their countries for they believe their participation is inefficient, or their roles as voters does not make a difference. Students declare themselves as “independent” or “no party” registered voters. For they believe that independent registered voters do not necessarily need to vote. Yet, a Gallup Poll report released in 2011, shows 40% of Americans identify as independent registered voters and this number is expected to increase. On the college level, even though there are no specific instructions from administrations to professors to refrain from expressing political views, professors tend to be neutral and not willing to express personal opinions regarding political issues. As instructors are shy to express their political opinions in classes. Both sides, professors and students, are not aware about the importance of this exchange of information, which helps students to create and shape a personal political ideology. The goal of this research is to investigate the unspoken code that restricts instructors from speaking freely in classes, and find measures that rectify the problem.

04.08.13 Eugene “Bull” Connor: The Inadvertent Effects of his Reign of Terror

Brock Marshall, Southeastern Oklahoma State University

In 1954, the United States Supreme Court ruled in Brown v. Board of Education that the segregation of public schools and reverses the 1896 decision of Plessy v. Ferguson. The court cited the 14th Amendment’s equal protection clause as the basis for its decision that segregated schools are inherently not equal. The decision sent shockwaves throughout the country and especially the South. Outrage quickly set in throughout the South as Civil Rights leaders pushed for more reforms. Through events such as the Birmingham Campaign and the Freedom Riders, Civil Rights leaders set out to desegregate Birmingham, Al. This move outraged the Commissioner of Public Safety, Eugene “Bull” Connor who quickly became known as one of the staunchest opponents of Civil Rights. Connor became widely known for his tough and often violent responses to protest from Black Americans. Connor was even accused of collaborating with the infamous Klu Klux Klan. However, Bull Connor’s violent actions in protest of desegregation became a rallying cry for the movement. Also, the media extensively covered the Birmingham Campaign and opened the eyes of the world to the treatment of Black Americans in the southern United States. The media coverage led to public outcry for reform from supporters. Ironically, Bull Connor became a major player in the passing of the Civil Rights Act of 1964 although in a significantly different manner than he had imagined
04.08.14 Fetal and Maternal Rights in the Media: Abortion in Fictional Television and Cable News

Samuel Merchant,

University of Central Oklahoma

Previous research on “cultivation theory” has shown that the more time individuals spend watching television, the more likely they are to believe the social reality portrayed on television. These beliefs form moral and political perspectives, which can effect voting dispositions. Given this, my research tracks the portrayal of the topic of abortion in popular fictional television programming, and the coverage of abortion in contemporary cable news programming. The purpose of the study is to examine whether popular fictional programming represents reality with regard to the option of abortion, and to also examine the amount of pro-life, pro-choice, and/or neutral coverage of the topic of abortion in cable news programming. Although 22% of pregnancies end in abortion, only 1.1% of fictional television series include a serious consideration of abortion in plot lines. This study of the top cable news programs on CNN, FOX, and MSNBC found that objective journalism-based programming found disproportionate coverage of pro-life/pro-choice content, though significantly closer proportion when compared to opinion/commentary based programming. The 2012 Republican primary election must be taken into account, as a majority of the pro-life content on several shows involved Republican candidates for President promoting their pro-life positions.

04.08.15 Owning the Issues: Variation of Issue Salience among States

Shannon Bridgmon,

Northeastern State University

Political parties have many purposes, but their primary goal is to capture elected office (Aldrich 1995). They also serve as quasi-public organizations that mobilize the electorate and organize political debate. Previous research (Budge and Farlie 1977, 1983; Petrocik 1981, 1996) suggests that parties will emphasize issues that provide them an electoral or policy advantage. However, little exists to determine if this pattern extends to state politics. While initial research (Bridgmon 2010) confirms this approach for southern state parties, this paper will measure the levels of importance political parties in all U.S. states, as expressed through each state party’s platform. All official Republican and Democratic state party platforms drafted or in effect during 2010 will serve as the data for this study. After determining levels of issue salience variations, this study confirms that parties emphasize issues to maximize electoral prospects.
Women in Politics: a Look at the Rise and Fight of Women, in Politics, in the Middle East Following the Arab Spring

Natasha Wood,

Cameron University

The purpose of this analysis is to look at the rise and fight endured by Middle Eastern women in politics following The Arab Spring. An analysis of the countries of Iraq, Egypt, and Saudi Arabia follows, with the intent to show how women in politics have affected the Middle East. Throughout this analysis, this paper will examine the trials and tribulations of Middle Eastern women in politics to gain a more clear knowledge and understanding of their journeys, the impact the Arab Spring had on women in political roles, and the impact that the increased number of women in politics has had upon the politics in the Middle East. The paper will then turn to the methods of analysis in an effort to better acquaint the reader with the impact women have had on Middle Eastern politics and how Middle Eastern politics have had an impact on women. Ultimately, this paper will offer insight into the role women play in Middle Eastern politics and argue that women have had an impact on politics in the Middle East, as well as show the positive correlation of the increase in the number of women in politics to the rise of more democratic regimes in the Middle East.

Corruption of public officials in the state of Oklahoma

Davi Peetoom,

Southwestern Oklahoma State University

The content of this abstract will examine different forms of corruption exhibited by state employees by using specific examples of these crimes. The purpose of this presentation is to show that everyone is susceptible to corruption even if that person may be an employee of the state.
Don’t Leave, Stay in School: Developing a Predictive Model of Discontinuance

Maxwell Kwenda,

Cameron University

This study was conducted with the goal of providing additional insights on student retention using administrative data at Cameron University. The study delivers scorable measures of discontinuance using multivariate methods. Using Cameron University’s administrative data collected on 774 students, this study found that remediation reduces the odds of discontinuance in later semesters. Students with higher GPAs have reduced odds of discontinuing school. Non-minorities have higher odds of discontinuance in the first semester; there are no significant differences between minorities and non-minorities after the first semester. Concurrently enrolled students stay at Cameron University for the first year and then have the highest odds of discontinuance. Based on these findings, the author recommends that Cameron University should use predictive analytics as part of the decision-making process associated with student retention. Models in this investigation have predictive accuracy ranging from 70% to 86%; this is more than chance occurrence. Discontinuance should be studied semester-to-semester because there are variables such as financial aid whose effects vary from one semester to the next. If discontinuance is systemic, future analyses should include the entire student population and as many available variables as possible. Qualitative research (e.g., focus groups and unstructured interviews) is needed to contextualize the findings of this study.
04.09.02 Greek Life and its Effect on Persistence of College Students: A Comparison of Inter-Fraternal Council/Panhellenic and National Pan-Hellenic Council

Patrick Harrel, Allen Arnold, Victoria Campbell,

University of Central Oklahoma

This study is designed to determine the correlation, if any, between Greek affiliation and student persistence from one academic year to the next. The relationship between student involvement and academic persistence will be addressed within both traditionally Caucasian and traditionally African-American Greek organizations. The purpose of this study is to focus on the relationship between social involvement, in the form of Greek affiliation, and academic success, as measured by persistence from one academic year to the next. The goal of this study is to determine if being a part of a fraternal (brotherhood) or sisterly (sisterhood) organization impacts the persistence of students at the collegiate level. To keep biases at a minimum, the study will include individuals from both the traditionally Caucasian fraternities and sororities and those from traditionally African-American fraternities and sororities. The participants in this study will come from students who identify themselves as “Greek”. Greek refers to those who belong to a Greek-lettered organization belonging to Inter-Fraternal Council (IFC), Panhellenic, or (National Pan-Hellenic Council) NPHC. The survey that will be given will contain questions that pertain to persistence from one academic year to the next. According to Sutton and Terrell (1997) there was evidence shown that supported involvement within NPHC fraternities and sororities helps with the retention of their members in school.

04.09.03 Recidivism Reduction Programs in Vermont and Beyond

Elizabeth Maier,

University of Central Oklahoma

This research includes an extensive literature review of what programs currently work in reducing recidivism for adults, what programs might work, and what doesn’t seem to work. Information regarding where each program was successful (urban, suburban, rural), how each measured recidivism, and program details are included. Cost information for programs is provided whenever available. Additionally results from a focus group of practitioners in Vermont are reported. The practitioners were asked what is or isn’t working locally. The research also identifies what principles seem to be found in the successful programs.
Exiting the Life: Understanding Desistance From Methamphetamine

Shannon Jackson, Amanda Gautier, Elaine Bartgis, Emelia Chrisco, Kathryn Letourneau, Rashi Shukla,

University of Central Oklahoma

Methamphetamine is one of the most serious illicit drug problems in the U.S. and internationally. Methamphetamine can result in devastating consequences to those who become heavily involved in the lifestyle that accompanies addiction. Little is known about the pathways out of involvement with methamphetamine and challenges of transitioning out of the methamphetamine lifestyle from an insiders' perspective. This study examines how individuals with histories of extensive involvement with methamphetamine and manufacturing exit the lifestyle. Semi-structured, qualitative interviews were conducted with 33 former methamphetamine users. A majority of participants had histories of involvement with dealing/trafficking and manufacturing. While the individuals in this study escaped the methamphetamine-lifestyle, transitioning out was challenging and difficult on multiple levels. An insiders' perspective on the processes and factors that influenced desistance from methamphetamine and specific challenges that were experienced will be discussed.

Silent Victims - Children's Voices: An Exploratory Analysis of Children from Methamphetamine Homes

Kathryn Letourneau, Kathy Bell, Rashi Shukla,

University of Central Oklahoma

Methamphetamine poses major risks for children. Studies have examined child exposure to methamphetamine, health consequences, and physical and sexual abuse. Less is known about children's perspectives of their situations. The voices of children represent a significant gap in the literature. This study explores how children removed from methamphetamine homes understand and perceive their current situations. Qualitative data were obtained from forensic observation reports of children removed from their homes by law enforcement in a midwestern city. The sample consists of 107 children evaluated between 2001 and 2010. Children vary in their abilities to understand why they were removed from their homes. While children risk being traumatized due to the separation from a parent or caretaker, the data suggests that their experiences during police encounters can have a significant impact as well. There is a need to place children at the forefront of responses to the methamphetamine epidemic. Further research is needed on this understudied population, including identifying the long term impacts of these experiences on children's development and well-being. The social and environmental conditions that drug endangered children are exposed to may place them at greater risk for engaging in illicit drug activity and other deviant behaviors.
Demonic Possession: The Role View of the Self, Group Influence, and Ritualism Have on Those who are Dealing with Demons.

Jessica Smith,  
*University of Central Oklahoma*

The purpose of this research is to explore possible social influences on the phenomenon of demonic possession. This research hypothesizes that the demonically possessed are people who have at least one emotional problem, that groups—such as deliverance ministries—can heavily influence the belief that one is possessed and once possession is established, rituals such as exorcisms, can help the possessed work through emotional issues and feel integrated into a group, even if the rituals themselves are not “curative.” Data is from an omnibus survey of 340 students attending a mid-sized, public, metropolitan university in Oklahoma. Inferential and descriptive statistics are utilized to explore this burgeoning topic, and future directions for research are discussed.

Social Workers Assessing Social Issues

Kirsten Gothard,  
*East Central University*

The purpose of this study was to assess how informed undergraduate social work students are about current social issues compared to professional social workers. A content analysis was conducted of a leading social work journal to identify the major social issues from the past five years. From that analysis the top fifteen issues were identified. A survey was given to social work students and professionals asking them to rank the top ten social issues. The study hypothesis was that professional social workers would be more informed of the leading social issues than social work students. With the findings it is hoped to identify any knowledge gaps within the social work curriculum and to measure the relevance of national publications to social work practice.

The Influence of Counseling, Memorial Services for Suicide Victims, and Friendships with Suicide Victims on Suicidal Ideation and Suicide Attempts Among Adolescents

Shawna Ward,  
*University of Central Oklahoma*

Individuals exposed either directly or indirectly to suicide have an increased risk of suicide (Suicide Prevention Resource Center 2004). This study used an availability survey, followed by descriptive analysis and regression analysis. A total of 331 UCO college students were surveyed. A Self-reported questionnaire was administered regarding whether or not the students had been exposed to counseling services following the suicide of someone they know, whether or not the students believed memorial services were beneficial for friends and family members of someone who has committed suicide, and whether or not the student or someone close to him/her had ever contemplated, attempted, or committed suicide. Regression results of this survey indicate a significant correlation between familiarity (i.e., family member or close friend) with someone who has attempted or committed suicide and suicide contemplation or attempts among the population surveyed.
04.09.09  The Process of Burnout in Community Mental Health Counselors

Alan Moore,

*Cameron University*

After almost four decades of burnout research, the process of burnout is still not clearly understood. This study utilized grounded theory to address this deficiency and provide a theoretical framework of transitional stages which captures the developmental course of this phenomenon as it is endured by community mental health counselors. Five distinct but related themes emerged which represent psychological phases the participants encountered as burnout progressed. These were vulnerability, inconsistent self, questioning competency, negative perspicacity, and loss of meaning. The results of this study indicate that this phenomenon is, to an extent, self-made through cognitive appraisals. The ongoing interplay between a demanding environment and burnout symptoms appears to be mediated by the nature of these appraisals which involve causal attributions and evaluating the significance of one’s work. Burnout begins and is sustained by negative interpretations of job experiences and a persistent focus on causes which eventually lead to a profound loss of meaning. It is suggested that interventions to address this phenomenon consider ways to help counselors shift their focus from negative causal attributions to rediscovering the intrinsic value of their work through meaning-focused coping strategies. Newly emerging research and the results of the present study affirm the value of studying burnout through an existential perspective.

04.09.10  An Analysis of State Park Self-sufficiency

Hung-Ju Chien, Kao-Wen (Grace) Chang, Lowell Caneday,

*Oklahoma State University*

State Park System protects natural resources and provides natural-based recreation for all people. State Park System attracts an annual attendance of over 700 million which is three times more than the attendance of National Parks. In FY2010, there are 2,194 state parks in the United States and 2,121 state parks are in operation. However, with recent economic trends and budget short-falls at the state level, several state park systems have been directed to move toward self-sufficiency in operations. Self-sufficiency is that an agency is able to generate enough operating revenues to cover its own operating expenditures. Thus, the analysis of self-sufficiency focuses on the operating revenues and operating expenditures. The purposes of this research aim to investigate the state park self-sufficient status and to analyze financial structures of operating expenditures and operating revenue sources of State Park System.

04.09.11  Forensic Linking of Y-Chromosome DNA

Tina Rainwater, Michael Wilds,

*Northeastern State University*

This project examines the forensic applications of Y-Chromosome DNA that specifically target the male-specific portion of the human genome (the non-recombining portion of the Y chromosome or NRY) in relationship to clearing unsolved crimes. Such forensic applications are especially important in solving crime scenes where only a small amount of male DNA is present such as sexual assaults, burglaries, and some homicide cases. The poster will present a longitudinal analysis of forensic linking of Y-Chromosome DNA to unsolved crimes, and address current constitutional issues related to such forensic applications.
04.09.12  The Hyper-Fear and Shocking Accounts of Sexual Assault to our Brothers and Sisters in Arms

Pamela Mertens, Corye Stover,

Northwestern State University

This presentation presents statistics of claims, incidents and legal findings of sexual assaults occurring within the United States Military branches. The presentation will display statistics of victimization for both sexes, being that sexual assault claims have been made by both male and female service members. Military training and legislative progress in reducing hyper-fear and the actual number of sexual assault incidents will be displayed as well. Electronic links providing further information pertaining to additional research, legislative support and how to further educate oneself on how to avoid sexual victimization will be made available.
02. Animal Science

05.02.01 Prediction of Heat Production in Boer Goats Using Heart Rate

Arthur Goetsch, Amanda Manley, Ryszard Puchala, Terry Gipson, Tilahun Sahlu,

Langston University

Heart rate (HR) is often used to predict heat production (HP) by livestock in settings with unrestricted movement. Most accurate prediction is with HP:HR of individuals. The decrease in accuracy from predicting HP based on an average HP:HR was determined with 163 Boer goat bucks used in two 84-day performance tests, having an average HP:HR of 5.63±0.098 kJ/kg BW0.75 per heart beat. HP:HR was determined once for 1 day with a head-box respiration calorimetry system for measuring O2 consumption and production of CO2 and CH4, and HR was measured at the same time. HP predicted based on the average HP:HR was moderately correlated with that based on individual HR:HP (r=0.55; P<0.05). When using the average HP:HR, 22% of the bucks had HP not different from the estimate using individual HR:HP. The number of animals with maximum error of 5, 10, 15, and greater than 15% was 30, 23, 14, and 12%, respectively. When using the average HP:HR to calculate HP, the percentage of under- and overestimates was similar (9.6 vs 9.5%, respectively, P=0.91). However, the distribution pattern of HP observations differed (P<0.05) between method of determination, with means of 561 and 565 kJ/kg BW0.75 and SD of 56.5 and 85.4 for use of individual and average HP:HR, respectively. These results support the advantage of using HP:HR of individual animals to predict HP from HR, but suggest potential use of average ratio in some instances, such as with large expected treatment differences in HP.
05.02.02  Factors Influencing Feed Intake, Growth Performance, and Behavior by Boer Wethers With an Automated Feeding System

Arthur Goetsch, Ryszard Puchala, Terry Gipson, Tilahun Sahlu, Yoko Tsukahara, Langston University

Effects of the number of Boer wethers per automated feeder and length and time of feeder access on feed intake, growth, and behavior were determined during a 10-wk period. Treatments were 6 and 12 wethers per pen and feeder with continuous access (C-6 and C-12, respectively); 2 and 4 wethers per feeder with 8 h/d access during daytime (D-2 and D-4, respectively); and 4 and 8 wethers per feeder with 16 h/d access at night (N-4 and N-8, respectively). Dry matter intake (DMI) was greater for continuous vs restricted access and for N vs D (2.04, 2.01, 1.45, 1.50, 1.92, and 1.76 kg/d), and feeder occupancy time per wether tended to be greater for continuous access (1.83, 1.55, 1.23, 1.34, 1.51, and 1.25 h/d for C-6, C-12, D-2, D-4, N-4, and N-8, respectively). There were effects of continuous vs restricted and D vs. N on average daily gain (ADG) and a tendency for an interaction between time and length of restricted access (237, 252, 174, 207, 247, and 211 g for C-6, C-12, D-2, D-4, N-4, and N-8, respectively). ADG:DMI tended to be greater for N than for D (128, 130, 97, 117, 150, and 127 g/kg), although residual feed intake (RFI) was greater for continuous vs. restricted access and tended to be less for D vs N and for 2 vs. 4 h/d of maximal occupancy time per wether (121, 20, -63, -165, -16, and -14 for C-6, C-12, D-2, D-4, N-4, and N-8, respectively). In conclusion, restricting feeder access influenced feed intake, growth, and behavior, with results impacted by time of access.

05.02.03  Factors Affecting Behavior of Goats in Pens With Electric Strand Additions to Cattle Barb Wire Fence

Arthur Goetsch, Glenn Detweiler, Terry Gipson, Tilahun Sahlu, Yoko Tsukahara, Langston University

Effects of meat goat breed, gender, experimental period, and preliminary and washout treatments on behavior in pens with electric strand modifications to cattle barb wire fence were determined. Boer and Spanish wethers and doelings were assigned to 5×5 Latin squares. Test pens one side with barb wire strands at 30, 56, 81, 107, and 132 cm from the ground. Fence treatments were electric strands at 15 and 43 (LH), 15 and 23 (LM), 15 (L), 23 (M), and 43 cm (H) at 6 kV. During a 4-wk adaptation period, animals were sequentially exposed each week to test pens with different fence conditions. Two treatments were applied the week before the first measurement period. During the Latin square periods, animals were placed in test pens and observed for 1 h. Different treatments also were employed in the 1-wk interval between observation periods. There were no effects of gender or preliminary or interval treatment. Fence treatment affected the percentage of animals exiting test pens (31, 23, 16, 35, and 30% for LH, LM, L, H, and M, respectively). Breed also influenced exit (12 and 43% for Boer and Spanish, respectively). Exit decreased as period advanced (60, 35, 23, 10, and 8 % for 1, 2, 3, 4, and 5, respectively). In conclusion, meat goat breed needs to be considered in development of a method to evaluate electric fence additions to cattle barb wire fence, and differences in exit among periods indicates that a Latin square approach may not be suitable.
Effects of (-)-Epigallocatechin-3-gallate (EGCG) on Viability of Haemonchus Contortus and Immune Responses in White Blood Cells of Goats In Vitro

Arthur Goetsch, Daowei Zhou, Rhongzhen Zhong, Tilahun Sahlu, Zaisen Wang,

Langston University

Effects of (-)-Epigallocatechin-3-gallate (EGCG; a polyphenol in green tea extracts) on viability of third-stage larvae (L3) of Haemonchus contortus and cytokine gene expression in white blood cells (WBC) of goats were investigated. Viable L3 in phosphate buffered saline (PBS) were delivered to each well of a 96-well culture plate with EGCG at concentrations of 0, 50, 100, 250, 500, 1000, 3000, or 5000 μg/ml. Viability of larvae was determined at 12, 24, 48, 72, and 96 h after exposure to EGCG. Viability decreased with increasing dose of EGCG and with increasing time. The reduction of viability after 96 h was 3, 21, 41, 48, 45, 92, 100, and 100% for 0, 50, 100, 250, 500, 1000, 3000, and 5000 μg/ml of EGCG, respectively. Isolated WBC were cultured. Treatments were control (without antigen or EGCG), antigen (20 μg protein/ml) only, antigen plus 5 μg/ml EGCG, and antigen plus 50 μg/ml EGCG. Cells were harvested at 0, 1, 2, 4, 12, and 24 h after treatment. L3 antigen up-regulated expression of IL-4, IL-6, IL-10, IL-12, IL-17, IFN-γ, and TNF-α, but depressed IL-2. EGCG synergistically up-regulated expression of IL-4, IL-6, and IL-17, but down-regulated IL-12 in the cells stimulated with L3 antigen. In conclusion, EGCG may have anthelmintic effect on H. contortus as well as indirect influence through regulating immune responses of lymphocytes. Further work is needed to investigate whether EGCG can exert anthelmintic effects in live animals.

Spatial-Temporal Movements of Grazing Goats

Arthur Goetsch, Terry Gipson,

Langston University

A study was conducted to monitor grazing behaviors in goats. Fourteen Spanish wether goats were fitted with GPS collars and released into a 14-ha paddock. Collars that recorded a fix every 5 min were deployed for 2 wk during the early summer. Fixes from 1 h after sunrise (07:00 h) until 1 h before sunset (19:30 h), resulting in 2,730 fixes, were analyzed for grazing behaviors, which included distance traveled and turning angles, using a repeated measures analysis. Distance traveled was calculated from two consecutive fixes and turning angle involved three consecutive fixes. Turning angle was then categorized into four quadrants. Hour of the day greatly affected (P < 0.01) distance traveled, peaking at 1,440 m traveled at 13:00 h with two minima at 10:00 and 17:00 h (266 and 430 m, respectively). The time of 13:00 h also accounted for proportionally the greatest percentage of forward movements (79, 5, 6, and 10% for forward, backward, left, and right, respectively, for that hour) and the 10:00 and 17:00 h accounted for the least (46, 13, 21, and 20% for forward, backward, left, and right, respectively, for those hours). Generally, forward movements accounted for 61% of the fixes, right and left movements were equal at 15%, and backward movements were 9%. These results indicate that goats had directed movement at mid-day and more tortuous movement at mid-morning and mid-afternoon.
05.02.06 The Effects of Level and Length of Supplementation on Leather Characteristics of Yearling Boer and Spanish Wethers

Arthur Goetsch, Anton El A'mma, Cheng-Kung Liu, Nick Latona, Roger Merkel,

Langston University

Spanish and Boer wethers were used to determine effects of level and length of supplementation on leather characteristics. The experiment started in January and had 110 and 108 day periods (PR). A pelleted diet was supplemented at 0.5 or 1.5% BW (DM; L and H, respectively). Skins were salted for 10 to 14 d and then chrome tanned. There were BR differences in initial BW (33.3 and 23.7 kg), initial thickness of leather (1.83 and 1.48 mm), and % elongation (66.6 and 55.1% for B and S, respectively). ADG was greatest among PR-BR treatments for PR1-B (139, 74, 63, and 56 g for PR1-B, PR1-S, PR2-B, and PR2-S, respectively). Leather thickness (1.91 vs 1.71 mm) and tensile strength (31.0 vs. 28.1 MPa) were greater for B vs S. Percent elongation was greater in PR1 than PR2 (51.9, 58.6, 45.1, and 40.5%, for PR1-H, PR1-L, PR2-H, and PR2-L, respectively) and greater for B than for S skins (50.6 vs. 47.4%). Young’s modulus was unaffected by BR (15.9 and 14.7 MPa for B and S, respectively) but was greatest for L goats in PR2 (9.47, 6.93, 19.38, and 25.61 MPa for PR1-H, PR1-L, PR2-H, and PR2-L, respectively). Fracture energy was higher for B than S skins (5.39 vs. 4.61 J/cm3) and was greatest for L goats in PR1 (5.00, 5.96, 4.73, and 4.32 J/cm3 for PR1-H, PR1-L, PR2-H, and PR2-L, respectively). As goats aged, leather stiffness increased. Boer goats had greater skin thickness than Spanish, which contributed to the greater values of B leather for tensile strength and % elongation.

05.02.07 Efficacy of a Bovine Colostrum Replacement Product for Goat Kids

Arthur Goetsch, B Bah, D Haines, S Genova, Steven Hart,

Langston University

When adequate doe colostrum is not available for neonatal goat kids an alternative source of colostrum is necessary. The objective of this study was to determine the efficacy of a commercially available bovine colostrum replacement product (Land O’Lakes Colostrum Replacement manufactured by The Saskatoon Colostrum Co., Ltd., Saskatoon Canada) in neonatal goat kids. Goat kids were removed from the doe at birth and a jugular blood sample taken for analysis of serum IgG. The colostrum replacement was reconstituted with water. Kids were fed reconstituted colostrum replacement at 10% of their body weight divided into three feedings over a 16-hour period. Six hours after the last feeding another blood sample was collected for determination of serum IgG. Kids were observed for 10 minutes after each feeding for any adverse reactions. After the three feedings of colostrum kids were fed a milk replacer and offered starter feed. Health and weight gains were compared to other kids fed heat-treated goat colostrum up to 3 weeks of age. Postfeeding level of IgG was much greater than prefeeding, and the level post-feeding was the same for both colostrum treatments. There were no cases of scours or off-feed conditions. Weight gain was similar for both treatments as well. In conclusion, the bovine colostrum substitute resulted in satisfactory blood levels of IgG and kids that were equally healthy to cohorts and gained similarly.
Effects of Level and Length of Supplementation on Body Weight and Harvest Characteristics of Yearling Boer and Spanish Wethers

Arthur Goetsch, Roger Merkel, Terry Gipson, Zaisen Wang,

Langston University

Yearling Spanish and Boer wethers were used to determine effects of level and length of supplementation on body weight and harvest characteristics. The experiment started in January, with wethers residing in four pastures primarily with warm season grasses. Alfalfa hay was given free-choice and a pelleted diet was supplemented at 0.5 or 1.5% of body weight. Wethers were harvested at the beginning of the study and after 110 and 218 days. Live and carcass weight were greater initially for Boer than for Spanish wethers. Average daily gain was greater for Boer vs Spanish wethers in the first part of the study but was similar thereafter. Body weight was greater with the high than low level of supplementation, as was also true for weight of the carcass and noncarcass components. Digestive tract and mass relative to empty body weight were similar between breeds. Liver mass was lower for the high vs low level of supplementation and less at the end of period 2 than 1. Mass of internal fat was increased by the high level of supplementation in period 2 but not period 1. In summary, advantages of Boer in body weight and carcass weight were similar after period 1 and 2, breed had little effect on noncarcass components relative to empty body weight, and a long feeding period was required for effect of the high level of supplementation on mass of internal fat.

Ruminal Methane Emission by Boer and Spanish Does Supplemented with Garlic

Arthur Goetsch, Ryszard Puchala, Tilahun Sahlu, Zaisen Wang,

Langston University

Twenty Boer and 20 Spanish does were used to examine effects of garlic on ruminal methane emission and heat production. All does received 200 g/day (as-fed basis) of a concentrate mixture, and one-half of the does also received 20 g/day of garlic powder. For at least 2 months does grazed grass/forb pastures in the summer. Thereafter, sets of four does consisting of one doe per treatment were sequentially placed in metabolism crates for 2 weeks, continued to receive supplements, and were fed coarsely ground alfalfa hay free-choice. Gas exchange was measured on the last day for 24 hours in an indirect, open circuit respiration calorimeter system with four metabolism cages fitted with head-boxes. There were no interactions between breed and supplement treatment. Intake of alfalfa hay during the calorimetry measurement period was greater for garlic than for control does. Ruminal methane emission was less for garlic than for control in g/day and relative to intake of dry matter and energy. Treatment did not affect the respiratory quotient, heart rate, heat production, or the ratio of heat production to heart rate. In conclusion, supplementation with garlic decreased ruminal methane emission and increased dry matter intake by Boer and Spanish does consuming alfalfa hay.
05.02.10  Effects of Meat Goat Breed, Gender, and Conditions Before and Between Measures on Behavior in Pens with Barb Wire and Electric Fence Strands

Arthur Goetsch, Glenn Detweiler, Terry Gipson, Tilahun Sahlu, Yoko Tsukahara,

Langston University

Growing Boer and Spanish goats were used to evaluate conditions for a method to test efficacy of electric fence strand addition to barb wire fence for cattle to contain goats. Test pens included one side adjacent to a pasture with abundant vegetation with barb wire strands at 30, 56, 81, 107, and 132 cm from the ground. Fence treatments were electric strands at 15 and 43 (LH), 15 and 23, 15, 23, and 43 cm at 6 kV. Adaptation procedures entailed four sequential weekly exposures to test pens: no electric strands, one strand at 0 kV, LH, and LH. Two preliminary treatments were imposed the week before the first observation period in week 1: barb wire with no electric strands vs. LH. All sets were observed for 1 hour in week 1, and four sets were exposed to the same fence treatment in week 6. During the 5 weeks between observations, sets were exposed to two washout treatments while on pasture: without or with electric strands at ≥ 6 kV situated next to concentrate feeders. Differences among fence treatments in the percentage of animals exiting pens were as expected based on the number and position of strands. More goats received a shock in week 1 vs. 6. Behavior of Boer and Spanish goats differed; therefore, breed should be a consideration for the testing method being developed. Adaptation procedures employed appeared conducive to use of an experiment with one observation period, whereas repeated observations would necessitate evaluation of other washout treatments.

05.02.11  Anthelmintic Efficacy of Medicinal Herbs in Goats Infected with Nematode Parasites

Arthur Goetsch, Daowei Zhou, Rhongzhen Zhong, Zaisen Wang,

Langston University

Boer does naturally infected with Haemonchus contortus from grazing pasture were allocated to five groups and moved to a barn to investigate anthelmintic efficacy of three medicinal herbs, Rheum palmatum L. (rhubarb), Meliae cortex (melia bark), and Quisqualis indica L. (rangoon creeper). Does were given ad libitum access to grass hay and water and a limited amount of a concentrate-based supplement. Treatments were control, rhubarb, melia bark, rangoon creeper, and a 1:1:1 mixture of the three herbs. The herbs in powder form were mixed with water just before drenching. After being acclimated for 7 days, does were drenched with water alone or with the respective herbs at 20 g/day for 10 days. Fecal samples were collected on days 0, 3, 6, 9, 13, and 16 after the start of drenching for worm egg count. Blood samples were taken on day 0 and 13 for measuring packed cell volume. After 10 days of treatment, none of the herbs showed anthelmintic effects. Compared with control does, does treatment with rhubarb and the mixture had higher packed cell volume; however, the increases may have been due to scouring in response to treatment with rhubarb. In conclusion, these herbs were not effective anthelmintics for the most problematic internal parasite of goats, H. contortus, in much of the US.
05.02.12 GIS Grid Analysis of Utilization of Adjacent Pastures by Two Herds of Goats

Arthur Goetsch, R Heinemann, Steven Hart, Terry Gipson,

Langston University

A 15.8-ha pasture was stocked with 36 Spanish goats and 12 Angus cows (GC), and a 14.1-ha pasture was stocked with 36 Spanish goats without cattle (GO) to observe spatial patterns. The pastures consisted of fescue, bermudagrass, various Panicum such as switchgrass, bahiagrass, and broomsedge bluestem, but areas were reverting to woody plant species such as sapling-sized trees of pecan, elm, and honey locust. GPS collars used recorded a fix every 5 minutes in the first 2 weeks. A GIS point-in-polygon analysis using a 10 × 10 m grid was conducted for each pasture. The GO had greater explored space compared with GC. Of the grids explored, GO had a higher percentage with a density of 100 or more fixes than did GC, indicating a wider area of methodical exploration or habituation. Goats in GO preferred pasture locations closer to the water point than did GC; however, GC came to the water point earlier than did GO. The favored location in the morning for each pasture was near the water point in the eastern intersection of the pastures. During the remainder of the day GC favored the southwestern-most corner of their pasture near a central fence line. In the afternoon, GO preferred the location near GC but also had a favorite location shaded by trees in the center of the pasture. The spatial behavior of the groups of goats appeared to be influenced by each other, and presence of cattle may have inhibited GC from fully exploring their pasture.

05.02.13 Different Supplement Treatments for Lactating Meat Goat Does Grazing Grass/Forb Pastures

Arthur Goetsch, Glenn Detweiler, Jerry Hayes, Kesete Tesfai, Terry Gipson, Zaisen Wang,

Langston University

Lactating meat goats grazing 0.4-ha grass/forb pastures were used to determine effects on performance of different supplement treatments. Boer does with one or two kids were used in a study with four 4-wk periods starting 22 d after birth. Treatments were no supplementation, access to a 20% protein supplement block, and placement in a supplement pasture with mimosa (Albizia julibrissin) trees for 6 h 1 d/wk or twice weekly for 3 h/d. Forage mass was high and forage samples averaged 15% protein. Treatment did not affect doe average daily gain (ADG), although that by kids in the first three periods differed between type of supplement and frequency of supplement pasture access. Spanish does nursing two kids were used in a study with three 4-wk periods starting 66 d after kidding. Access to supplement pastures was for 24 h 1 d/wk or 2 d for 6 h/d. Forage mass was relatively low (i.e., 750 to 1,530 kg/ha) and, thus, grass hay was supplemented. Forage composition was similar to that earlier. Kid ADG in periods 1 and 2 was not affected by treatment. Doe ADG was increased by supplementation and greater with access to mimosa trees than the supplement block, which resulted from effects in period 3 after weaning rather than earlier. In conclusion, use of the supplement block was not beneficial, and infrequent access to supplement pastures had relatively small effects on average daily gain, perhaps because forage availability and nutritive value were not severely limiting.
Stocker cattle performance grazing wheat vs. three perennial cool season grasses (PCSG)

William Phillips, Jake Ward, Michael Hatter,

Redlands Community College

Wheat is the primary forage for winter grazing of stocker cattle in the southern plains however grazing is very dependent on weather condition. Scientist at the USDA-ARS Grazinglands Research Laboratory, El Reno, OK has been evaluating PCSG as a more stable alternative to the unpredictability of wheat pasture. Data was provided by the USDA and was used to compare the performance of stocker cattle grazing three different PCSG (Jose tall wheatgrass, Manska intermediate wheatgrass, and Lincoln smooth brome) to Wheat through three fall and spring grazing seasons. Cattle were grazed on 36 different plots (9 of each grass. Plots were grazed in the fall before cattle were combined into one group and grazed on wheat through the winter. Cattle were returned to plots in the spring. Start weights for the fall ranged from 512 lbs to 574 lbs with a standard deviation of 28.5 lbs. Average daily gain was different between grasses and year ranging from 1.45 lbs to 2.86 lbs in the fall and 2.77 lbs to 4.28 lbs in the spring but no trend was apparent. In the fall Wheat had higher carrying capacity than PCSG. In the spring carrying capacity was similar between all four grasses and PCSG pastures were grazed longer in the spring as compared to wheat. Performance of cattle on the various grasses was highly dependent on year.

Performance of Crossbred Heifers on Fescue Pastures with and without Protein Supplement

William Phillips, Anna Wolf, Ashton Fisher,

Redlands Community College

Beef stocker calves have lower average daily gains (ADG) when grazing fescue pastures as compared to wheat pasture. We theorized that dietary crude protein (CP) concentration limited animal performance. Data provided by USDA-ARS Grazinglands Research Laboratory, El Reno, OK was used to determine the impact of providing CP supplements (SUPPL) to stocker calves grazing fescue pastures in the fall and again in the spring. Start weight (SWT) of the heifers used was 564 ± 12.0 lbs (fall) and 718 ± 20.2 lbs (spring). Final BW of the heifers was 588 ± 23.2 lbs (fall) and 779 ± 25.9 lbs (spring). In the fall, heifers consumed more (P< 0.07) of the 20% CP SUPPL than the 40% CP (3.4 ± .64 vs. 2.2 ± .48 lbs.). In the spring, SUPPL intake averaged 1.54 ± .37 lbs and was not different (P> 0.41) among treatments. Providing CP to heifers grazing fescue pastures did not increase ADG. Additional research is needed to determine the factor limiting animal performance on fescue diets.
VSM-1’s Role in Mitochondrial Localization

Timothy Stein, Andrea Holgado,

Southwestern Oklahoma State University

VSM1 is a protein first identified as a synaptobrevin-like interacting partner in yeast. Gerst and colleagues showed that in the absence of VSM1, more exocytic functions take place, suggesting VSM1’s inhibition roles in membrane fusion. Studies from our lab show the C. elegans homologue of yeast VSM1 seems to play a similar role in the nervous system. Genome-wide analysis demonstrated that a family of genes coding for Major Sperm Proteins (MSPs) is specifically activated in VSM-1 mutant backgrounds, leading us to believe that MSPs and VSM-1 both may regulate synaptic function. Previous research also shows that in the case of fruit flies, MSPs are important in the regulation of mitochondrial localization and growth cone morphology. We hypothesize that the synaptic role of VSM-1 may be to modulate MSP function and mitochondrial localization. To test this hypothesis, a strain of C. elegans containing body wall muscle mitochondrial GFP was crossed with a strain lacking expression of VSM-1, as well as a strain overexpressing VSM-1. Florescent analysis of mitochondrial localization shows a lack of VSM-1 does not interfere with the localization of the mitochondria, however, overexpression of neuronal VSM-1::GFP significantly altered mitochondrial morphology and localization in body wall muscle. Currently, we are examining whether this phenotype is dependent on the presence of MSPs in C. elegans. This analysis involves the use of RNAi for MSPs and further mitochondrial examination.
Analyzing Modulators of Vesicle Fusion and Synaptic Signaling

Jamin Brown, Andrea Holgado, Elizabeth St. John, Monte Stone,

Southwestern Oklahoma State University

Synaptic transmission in C. elegans is mediated by VSM-1, a SNARE interacting protein that prevents the formation of SNARE complexes. Our preliminary results show that in the absence of VSM-1, C. elegans experience an increased rate of synaptic transmission, suggesting that in this case SNARE complex formation occurs without inhibition. In characterizing the functional role of VSM-1, we hypothesize that VSM-1 may act by preventing vesicle fusion, thus inhibiting the release of neurotransmitters. Mutant rescue attempts using microinjections of recombinant DNA plasmids suggest that expression of VSM-1 fused to GFP in nerve cells alone is not sufficient to reverse the effects of the VSM-1 mutation and restore the mutant to the wild-type phenotype. To further elucidate whether lack of rescue was due to expression in neurons only or due to GFP altering the normal functional role of VSM-1, we began producing transgenic lines expressing VSM-1 and fluorescently labeled VSM-1 in muscle cells, nerve cells, and both. Initial rescue analyses using an aldicarb medium followed by additional studies using transgenic lines show that expression of VSM-1 did not result in a reversion to the wild-type phenotype. Instead, we scored a significant hypersensitivity to the aldicarb, indicative of enhanced synaptic activity. Construction of additional nematode lines expressing non-fluorescent versions of VSM-1 in these tissues is underway.

Molecular Components Controlling Synapses in Nematodes

Ashley Rodriguez, Andrea Holgado, Josiah Dittrich, Kody McKay, Melanie Graham,

Southwestern Oklahoma State University

A synapse is a cellular junction that is formed by the presynaptic terminal of the signaling cell and the postsynaptic terminal of the target cell. A neuron communicates to other neurons by secreting neurotransmitters into synapses, which then bind to receptors on the target cell. Previous studies have shown that a protein, VSM-1, regulates the exocytosis of neurotransmitters. Additionally, vsm-1 mutants have shown an increase in synaptogenesis. We hypothesized that genes are expressed in vsm-1 mutants that enhances synaptogenesis. In order to analyze the genes of interest we utilized the tools of microarray. In our experiments, we first isolated the total RNA from young-adult wild-type and vsm-1 mutant Caenorhabditis elegans. Next, we synthesized cDNA from reverse transcription of the isolated RNA. Hybridization of the cDNA to a microarray was performed to facilitate gene expression profiling. Fluorescently labeled microarrays were analyzed and the identities of induced and repressed genes were uncovered using the open source software called Magic tool. Microarray experiments were performed using three biological replicates and two technical dye swaps. Preliminary work showed over-expression of genes coding for major sperm proteins in a vsm-1 mutant containing increased synaptic signaling. Microarray results were validated using real time PCR. Further research includes analysis of RNAi phenotypes after expression of major sperm protein family is knocked out.
05.03.04 Probing molecules involved in calcium-regulated membrane fusion

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VSM-1 is a protein believed to be involved in the regulation of neuronal exocytosis through interactions with exocytic proteins called SNARES. While working with yeast, Jeffery Gerst showed that VSM-1 contains a retroviral protease (RVP) domain which is essential in the regulation of this process. Based on these and other findings, we hypothesize that VSM-1 may bind to and cleave the neuronal v-SNARE synaptobrevin, and thereby inhibit neuronal exocytosis. To test this hypothesis, we constructed recombinant plasmids, using site directed mutagenesis and other molecular biology approaches, which could express fusion proteins such as VSM-1 and SNAREs. These fusion proteins would later be isolated and employed in bait and prey pull down, as well as protein cleavage, assays. Results showed that the v-SNARE protein synaptobrevin binds to full length VSM-1 and that the amino terminus portion of the protein seems to be important for this interaction. Furthermore, analyses of cleavage studies showed no apparent reduction in size of synaptobrevin, suggesting that cleavage does not occur or is undetectable by the technical approach used. Furthermore, we determined that synaptobrevin does not seem to be the substrate for the RVP catalytic activity of VSM-1. However, we are currently investigating cleavage assays for potential catalytic activity using a more sensitive technique such as HPLC.

05.03.05 Genetically-Programmed Plant Marker Gene Deletion with Bxb1-att Site-Specific Recombination System

Frank Yau, Kevin Wang, Mona Easterling,
Northeastern State University

An important tool for the production of GM crops is the selectable marker gene (SMG), which allows for the identification of a few transformed plants from among the bulk of non-transformed plants. The SMG, usually an antibiotic or herbicide-resistance gene, remains in the genome of GM crops. Regulatory agencies and the public have raised concerns about the presence of SMGs due to food safety and environmental issues. Several strategies have been employed in plant genetic transformation to remove SMGs, including site-specific recombination (SSR) systems. The mycobacteriophage Bxb1 SSR system has been used in plant transgenesis to excise SMGs. The objective of this research is to use Bxb1, a uni-directional SSR system, to excise the SMG and render it unable to reinsert into the genome of the tobacco plant. The Bxb1 recombinase is codon-optimized to express in plants and is driven by a tissue-specific seed promoter. The binary vector was designed to allow the SSR system to delete both the SMG and the recombinase-coding region from the genome of the tobacco plant. The vector was transformed into tobacco, and T0 putative transgenic plants were obtained. GUS-positive T0 lines were transferred to soil for setting T1 seeds and used for excision analysis. Bxb1-mediated excision was preliminarily identified in T1 seeds, and T1 plants through junction PCR analysis. Sequencing has confirmed successful excision results.
05.03.06 Production of vampire bat saliva enzyme in transgenic plants for stroke treatment

Mona Easterling, Frank Yau, Kevin Wang, Maaike Mccutcheon, Northeastern State University

Stroke is the third leading cause of death in the US and a leading cause of adult disability. Plasminogen activators (DSPAs), enzymes from the saliva of blood-feeding vampire bats, have been found to act only on fibrin without excess brain bleeding. Clinical trials have shown that it can be used to treat urgent stroke patients without increasing risk for additional brain damage. Currently, recombinant DSPAs are produced in transformed yeast, animal cells, and insect cells. However, the yields of DSPAs produced from yeast and insect or animal cells are relatively low. Our research is using transgenic plants to produce DSPAs for stroke that are active, safe and inexpensive. We have developed the suitable plant transformation vectors for DSPAα1 and DSPAα2. DSPAα1 and DSPAα2 codons were optimized for tobacco plant. DSPAs were linked with ER signal peptides to minimize foreign protein degradation. Seed-specific promoter was used to express DSPAs because foreign proteins accumulated in seeds have been found to retain activity after more than three years of storage at room temperature. Tobacco plant transformation was accomplished. The tissue-cultured plants selected from antibiotic kanamycin have been transferred to soil and preliminary testing is underway.

05.03.07 Genetic Screening: Revealing the Components of the Cgi Regulatory System of Complementary Chromatic Acclimation in Fremyella Diplosiphon

Terry Phillips, Langston University

Some of the most prevalent organisms that use photosynthesis are plants, algae, and cyanobacteria. In order to efficiently harvest light energy to be used in photosynthesis, the cyanobacterium, Fremyella diplosiphon, undergoes cellular changes in response to varying environmental conditions. It has been known that F. diplosiphon adjusts its pigmentation in order to optimally absorb the environmental light color. This process is known as Complementary Chromatic Adaptation (CCA). The pigment change of the organism is due to a change in protein composition. In red light, the protein pycocyanin (PC) is produced and in green light, phycoerythrin (PE) is made. This is due to a change in gene expression and is controlled by two systems; the Rca and the Cgi systems. The Rca system is a signal transduction pathway in which RcaE senses red light and autophosphorylates. In turn, it is able to phosphorylate RcaF which phosphorylates RcaC. When phosphorylated, RcaC binds to a specific DNA sequence to activate PC related genes and repress PE related genes. However, in the absence of the Rca system, the levels of PE are still regulated. This additional regulation of PE is due to a second system called the Cgi system. We are conducting a mutant screen to find components of the Cgi system by using a transposon mutagenesis of cells lacking Rca system. The site of transposon insertion has been evaluated for four brown mutants of F. diplosiphon.
Use of Algae to Remove Cadmium from Aquatic Environments

Carmen Cowo, Jim Bidlack,

University of Central Oklahoma

Removal of pollutants from water using aquatic species is a well-documented topic in scientific literature. For example, water contaminated with cadmium, which is detrimental to the health of residing aquatic life as well as humans, may be remediated through use of algal species that accumulate this heavy metal. It has been shown that the blue-green algal species, Spirulina platensis, can uptake cadmium in surrounding water systems and remain viable. In this investigation, cadmium uptake by Spirulina will be evaluated using aquarium tanks, with a 6.5 liter capacity, in a controlled environmental chamber. After a standard amount of algae biomass has accumulated, cadmium will be added to implement treatments to equate 0.0, 1.0, 1.5, 2.0, and 2.5 milligrams of cadmium per liter. The Spirulina in each of these treatments will be grown for 20 days and then the biomass will be collected, as well as the water in each of the tanks. Fresh algae biomass, as well as water volume, will be measured first and then a sample of each will be set aside for cadmium determinations by atomic absorption spectrometry. The remaining algae biomass will be used for protein and other analyses, as well as dry weight measurements. Results will be used to determine if Spirulina can remove cadmium from water and how the algal species is affected by cadmium treatments.

Evaluation of Solvents used to Extract Chlorophyll for Photovoltaic Cells

Chelsie Johnson, Jim Bidlack,

University of Central Oklahoma

An experiment was conducted to evaluate several solvents used to extract chlorophyll from spinach for eventual use in photovoltaic cells. These cells were constructed with tin-oxide coated plates; the cathode was treated with graphite and the anode contained chlorophyll extracts embedded in titanium dioxide. Once treated with titanium dioxide, each anode was soaked in chlorophyll preparations made with one of three different solvents including ethanol, acetone, and water, for a period of 4 to 10 days. After air-drying anodes, complete photovoltaic cells were assembled with a drop of iodine / potassium iodide conducting solution, sandwiched between the plates. The cells were first tested to ensure that they produced significantly higher voltage in the presence of light compared to complete darkness. Power curves (in light) were then constructed for these cells using a resistance replacement box and maximum power was used to determine which resistance should be used for cells to measure voltage over a period of 10 to 30 days. Preliminary results demonstrated that photovoltaic cells constructed with acetone-extracted and ethanol-extracted chlorophyll can produce up to 350 millivolts, whereas cells constructed with water-extracted chlorophyll are unstable and, generally produce about 298 millivolts. We are currently in the process of evaluating the longevity of these cells and whether or not the same treatment differences exist over a longer period of time.
05.03.10 Continued Investigations on Use of Dragon’s Blood Pigment in Photovoltaic Cells

Brett Jones, Jim Bidlack,
University of Central Oklahoma

Both laboratory investigations and statistical analyses were pursued during the past year to gain additional information about the use of Dragon’s Blood (Daemonorops draco) in photovoltaic cells. In general, experiments conducted in Fall 2011 provided similar results compared with experiments during the previous year. In both of these experiments, the voltage values in cells treated with the pigment were significantly higher than values from control cells, which contained no pigment. It was decided to focus on calculating current and power readings from data collected and conclude these investigations with a manuscript for potential publication. As such, statistical analyses demonstrated that photovoltaic cells made with Dragon’s Blood produced average voltage, current, and power readings of 150 millivolts, 1.68 microamps, and 0.289 microamps, respectively, over a period of 19 days. These readings were significantly higher than values obtained at night and substantially higher than values obtained from cells constructed without pigment. The low cost of constructing these cells, coupled with their longevity, suggests that they have potential as economically-feasible and sustainable energy alternatives.

05.03.11 Use of Chloroplasts and Anthocyanin in Photovoltaic Cells

Hunter Porter, Jim Bidlack, Theodore Tetreault,
University of Central Oklahoma

An experiment was designed to determine the viability of using chloroplasts and concentrated anthocyanin in dye-sensitized solar (photovoltaic) cells. These cells were made using glass plates with a film of tin oxide; one coated with titanium dioxide embedded with pigment to serve as the anode and another coated with graphite to serve as the cathode. Anodes were soaked with chloroplasts extracted from spinach (Spinacia oleracea), or anthocyanin derived from the leaves of purple heart (Tradescantia pallida) or anthocyanin from red cabbage (Brassica oleracea), in order to embed pigments within the titanium dioxide. A KI/I2 electrolyte solution was sandwiched between the anode and cathode cells and opposing ends were connected to a voltmeter which recorded output over time using a Pico Recorder. Use of chloroplasts in anodes showed promising results, with some cells yielding over 800 millivolts per cell, whereas application of concentrated anthocyanin to anodes produced an average of 400 to 600 millivolts. Both chloroplasts and anthocyanin treatments produced voltages that were significantly above control counterparts, which averaged about 100 millivolts per cell. A preliminary longevity test of anthocyanin showed a voltage increase over a period of 15 days. Longevity tests for chloroplast and concentrated anthocyanin cells are currently being investigated.
Height and Biomass of a Barley - Soybean Rotation Subjected to Gibberellic and Jasmonic Acid Treatments

Matthew Johnson, Anna Graves, Dillon McDaniel, Hunter Porter, Jim Bidlack, Jonna Whetsel, Matthew Naifeh, University of Central Oklahoma

An experiment was conducted using gibberellic acid (GA), jasmonic acid (JA), and combinations thereof, to determine their potential in altering height and biomass of barley (Hordeum vulgare L.) grown during the winter, followed by soybean [Glycine max (L.) Merr.] grown during the summer. Treatments included 0.0 mM, 0.5 mM, 1.5 mM, and 3.0 mM applications of GA and JA, and combinations thereof, applied exogenously shortly after emergence for barley during the winter/spring and soybean during the summer/fall growing seasons. Plants were harvested at maturity and several measurements, including plant height, and weight of plant and plant components, were taken to assess responses to treatments. In general, GA increased height of soybean and JA decreased height of both barley and soybean. Although there were few significant differences among treatments in plant biomass, a trend demonstrated that JA consistently decreased biomass in both species. These results suggest that that GA and JA can be used to manipulate height in barley and soybean without substantial loss in biomass yield.

Increasing the Number of Native Americans in Natural Science and Medicine through Field Paleontology

Tanya Chapman, East Central University

Statistics taken by the US Census Bureau and the National Science Foundation indicate that the number of Native Americans earning degrees is the lowest among all ethnic groups. In 2008, Native Americans earned only 0.4% out of 533 doctorates in the Earth Sciences and 0.4% out of 5,135 doctorates in the Biological Sciences. Can exposure to these sciences increase the numbers of Native Americans earning degrees in these fields? The Native explorer Foundation gives Native American Students an opportunity to experience some of what the natural sciences has to offer. This research began at OSU College of Health Sciences followed by 1 week in the Oklahoma panhandle Field work in the techniques utilized in field Paleontology. Working side by side with scientists that have real world experience in field research. It concludes at East Central University in Ada Oklahoma. It will take numerous semesters to be able to fairly determine the Number of Native American students that will be affected through this experience.
Macroinvertebrate Assemblages and Water Quality Analysis of Spring Systems Associated with the Pontotoc Ridge Nature Preserve, Oklahoma

Kambridge Brown, David Bass,

University of Central Oklahoma

A study of springs in the Pontotoc Ridge Nature Preserve was conducted in 2011. This investigation compares the similarities between a 1995 survey (Bass 2000) and the 2011 survey, as well as between individual spring communities within that study. Quantitative samples of macroinvertebrates were collected using a Surber net, preserved, and returned to the laboratory for sorting, identification, and counting. In addition, qualitative samples were taken to capture species missed in the Surber net by using a D-ring net. Water quality analyses were used to test for ammonia, alkalinity, temperature, pH, dissolved oxygen, nitrates, nitrites, orthophosphates, and specific conductivity. Only quantitative data was used to calculate the Shannon-Wiener Species Diversity Index and those results are as follows: Smith Spring, 1.934 (2011) and 2.69 (1995); Cave Spring, 0.410 (2011) and 3.31 (1995); and Canyon Spring, 0.327 (2011). Similarities in species compositions, based on both quantitative and qualitative samples, was calculated using Sorenson’s Index of Similarity and the following results were found: Smith Spring (1995 v. 2011), 0.5; Cave Spring (1995 v. 2011), 0.077. Species composition similarities were also compared between the springhead and downstream samples resulting in a value of 0.692 for Smith Spring, 0.714 for Canyon Spring, and 1.00 for Cave Spring. These data will be useful as baseline information to compare future observations in these spring communities.

Bioinformatics Analysis of Forkhead box P2 Gene

Katlyn Varner, Jacinta Maiorana, Jan Byrd, Kathi McDowell, Omead Ghaeli, Richard Smedley, Sarah Cragun,

Northeastern State University

The proper development of the way we speak involves neurological systems associated with specific genes. FOXP2 codes for the proteins associated with the development and ability to learn language and speak. Autosomal dominant mutations in the Forkhead box P2 (FOXP2) gene cause speech and language abnormalities. Online Mendelian Inheritance in Man (OMIM), Genbank, Basic Local Alignment Tool (BLAST), Spidey, and Proteins are databases utilized in research of genetic disorders such as FOXP2. OMIM lists the location of the FOXP2 gene on chromosome 7-section q31.1 with 603Kp of genomic DNA. According to GenBank, the accession number of FOXP2 is NM_148898.3, and the organism is Homo sapiens with a sequence length of 6448 bp that codes for 740 amino acids. The three dimensional protein figure illustrates 6 domains each containing 2 beta-sheets and 3 alpha helices. The sequence NM_148898.3 is an mRNA with a coding region ranging from nucleotide 357-2597. A comparison between this mRNA and the DNA for this gene (NG_007491.2) indicates coverage of 91%, a percent identity of 100% and 16 exons on the Spidey database. By examining and learning about the FOXP2 gene through OMIM, GenBank, Spidey, Blast, and Protein databases, we are able to learn and better understand the processes that modern geneticists use when studying a particular gene.
05.03.16 Genetic variation within striped skunks in the northern and southern areas of the United States.

Sharonda Carson,

University of Central Oklahoma

Striped skunks (Mephitis mephitis) are found throughout the United States, in southern Canada, and northern Mexico. Skunks are vectors for rabies, of which there are three known rabies variants: one in the south central US, one in the north central US, and another in California. Research conducted on striped skunks has only studied isolated geographical standpoints, rather than comparing the skunks from all geographical areas simultaneously. Few genetic studies have been performed on Mephitis mephitis, and none have looked at the potential genetic subspecies. We hypothesized that infected Mephitis mephitis in the north and south represent more than one distinct genetic variant of skunks. DNA Tissue samples were collected from both the northern and the southern areas and DNA sequences from the mitochondrial DNA D-loop are being analyzed. Northern areas include WY, MO, IA, ND, and NE; southern areas include AZ, TX, KS, OK, and CA. Preliminary data does not appear to show a distinct demarcation between northern and southern skunks, although additional data is still being generated.

05.03.17 Molecular evidence for hybridization between Neotoma floridana and Neotoma micropus in multiple areas of sympathy

Michelle Haynie, Matthew Mauldin, Robert Bradley,

University of Central Oklahoma

The southern plains woodrat (Neotoma micropus) and the eastern woodrat (N. floridana) have a parapatric distribution that extends ~2,200 km from the Gulf of Mexico to southeastern Colorado. In 1968, and again in 1973, an area of sympatry where hybridization occurred was reported in western Oklahoma; hybridization was determined based on morphological measurements and laboratory breeding experiments. The objectives of this research are to 1) evaluate the known hybrid zone using molecular markers and 2) determine if additional areas of sympathy and hybridization occur. To date, 103 samples from the western Oklahoma hybrid zone (collected in 1988) have been genotyped at multiple loci and a high degree of hybridization (~85%) has been detected. Thirty-six localities outside the original zone of sympatry were surveyed and preliminary data indicates additional putative areas of hybridization between these two species. Future research will focus on further defining the boundaries of hybridization between the two species as well as determining the dynamics that maintain the zones.
05.03.18 Identification of Proliferative Myofibroblasts of Dupuytren's Contracture Cells

Tobi Odejimi, Melville Vaughan,
University of Central Oklahoma

Myofibroblasts are granular tissue fibroblasts that play a big role in wound contraction and synthesis of extracellular matrix components (Lorena et al., 2002). Dupuytren's contracture is a painless thickening and contracture of tissue beneath the skin on the palm of the hand and fingers. It is known that granular tissue proliferates but the goal of this experiment is to see if pathological fibroblasts proliferate, myofibroblasts proliferate, or if both undergo proliferation. This will be accomplished by using 5-ethynyl-2'-deoxyuridine (EdU) to better understand the process of proliferation in Dupuytren's contracture (DP) myofibroblasts. By treating different Dupuytren's contracture cells with EdU one is able to identify if the DNA replicated and thus the Dupuytren's contracture myofibroblasts proliferated.

05.03.20 The Budding Yeast Mcm10 Interacts with Polymerase Epsilon and Functions during Leading Strand DNA Replication

Brandy Fultz, Chance Hendrix, Sapna Das-Bradoo,
Northeastern State University

Evolutionarily conserved minichromosome maintenance protein 10 (Mcm10) plays a key role in DNA replication initiation and elongation. In eukaryotic cells, Mcm10 has been shown to interact with multiple replication fork proteins. In addition, Mcm10 has been shown to have a crucial interaction with polymerase alpha primase complex (Polα). While Polα is essential in initiating DNA replication, polymerase delta (Polδ) and polymerase epsilon (Polε) carry out the bulk of DNA synthesis. Recent studies indicate that, during DNA replication, Polδ synthesizes lagging strand DNA while Polε synthesizes leading strand DNA. Here, we set out to determine if Mcm10 interacts with Polδ and Polε in budding yeast, Saccharomyces cerevisiae. Both Polδ and Polε are composed of several subunits in S. cerevisiae. Polδ is a heterotrimer that contains the subunits pol3, pol31, and pol32. Pol ε is a heterotetrameric complex that comprises three small subunits (Dpb2, Dpb3, and Dpb4) and one large catalytic subunit (pol2). Our studies show a direct interaction between Mcm10 and polymerase epsilon. Furthermore, we show that Mcm10 interacts with the catalytic subunit of polymerase epsilon, pol2, by yeast two-hybrid assay. Interestingly, no interaction between polymerase delta and Mcm10 was observed. Our findings lead us to believe that Mcm10 is part of a protein complex involved with replication of the leading strand DNA.

05.03.21 Eastern Medicine

Stephen Cates,
Northeastern State University

Traditional Chinese Medicine (TCM) has a long history and its practice is still in use today. Different from Western Medicine that requires clinical trials to establish its usefulness, TCM has long been established through years of trial and error to find treatments that work. As the effectiveness of TCM treatments gain popularity in Western countries, research is being conducted in order to elucidate how this treatment works on a physiological and pathological level as well as how it can be applied to current Western treatments.
Parasite Survey of the Sonoran Mud Turtle (Kinosternon sonoriense)

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Parasitism has wide-reaching implications throughout the fields of ecology and medicine; while these pathogenic associations have been thoroughly documented across many taxa, parasitism among reptiles still remains severely understudied and poorly understood. Helminth infection among Testudines, specifically, is less understood; especially in regard to the effect diseased individuals may have on community health and structure. The Sonoran Mud Turtle (Kinosternon sonoriense) occupies an ephemeral, aquatic environment subject to seasonal drying. Little is known about the organisms parasitizing this species, specifically the study population located in the Peloncillo Mountains, New Mexico. Fecal samples were opportunistically hand-collected using catch-and-release trapping methods from May 2012 through October 2012 and preserved onsite in Zinc-PVA solution or 10% Formalin solution. Samples were concentrated and examined under light microscopy for the presence of Helminth eggs. Thus far, eggs from the genus Capillaria have been found in various samples. The Capillaria genus (Nematoda: Trichinellidae) contains filarial worms which prey upon a wide range of organisms including birds, mammals, and reptiles; however, Capillaria has yet to be documented within Kinosternon sonoriense. Further investigation into the extent of Capillariasis which exists within the Peloncillo population, as well as other possible parasitic infections within the population is warranted.

A review: Acupuncture in Preventing Atrial Fibrillation

Faith Fennell,

Northeastern State University

Atrial fibrillation (AF) is the most common clinical arrhythmia. Age and improved survival in cardiac disease has lead to an increase in AF patients. AF patients are symptomatic and have a reduced physical ability and higher risk for thromboembolic events. AF is also associated with increased mortality. To control sinus rhythm and prevent further recurrences, antiarrhythmic drugs are commonly used even with their limited efficacy and adverse effects. In traditional Chinese Medicine, acupuncture has been found to manage certain tachycardia with recent Western studies showing treatment for arterial hypertension and chest pain. This study attempts to look at the efficacy of acupuncture in preventing or reducing the rate of AF recurrences in patients.
05.03.24  A Review on: Induced Pluripotent Stem Cells

Lauren Tull,

Northeastern State University

Dr. John B. Gurdon and Dr. Shinya Yamanaka were awarded with the 2012 Nobel Prize in Physiology or Medicine for their research that revealed mature, differentiated cells have the ability to be reprogrammed to revert back to a pluripotent stem cell state. Prior to their discovery the common thought in regards to mature cells was that once a cell differentiated it was unable to revert back to a pluripotent stem cell state. This view was changed when Dr. Gurdon discovered in 1962 that a nucleus taken from a differentiated frog intestinal epithelial cell had the ability to generate a fully functional tadpole when transplanted to an enucleated egg. Despite Dr. Gurdon’s work, the question of whether an intact differentiated cell had the ability to be completely reprogrammed to become pluripotent. Dr. Yamanaka would answer this question in 2006. His research proved that the introduction of four transcription factors into a differentiated cell was enough to revert the cell to a pluripotent state. This discovery has the potential to be applied to assist in creating disease models for pharmaceutical application, which would eliminate the problems with the animal models. One problem is that some drugs that are effective in animal models such as mice are not effective in human patients. This would be eliminated because the patient’s own cells could be used in the disease model. Also this discovery could be applied in regenerative medicine, also known as cell therapy.

05.03.25  Inhibition of Hepatitis C Virus (HCV) Replication and Cancer Stem Cell-Like Cell Markers by Resveratrol

Charles Nguyen, Asim Ali, Courtney Houchen, Hari Kotturi, Naushad Ali,

University of Central Oklahoma

Chronic infection of Hepatitis C virus (HCV) is a prominent risk factor for the development of liver cancer. Current FDA-approved therapy is not effective and well tolerated in many patients, and those cured of HCV still remain at risk for developing cancer. Therefore, finding a novel therapeutic that targets both HCV and HCV-induced cancer is a high priority. Resveratrol (RES) is a polyphenol that has been widely studied for its pleiotropic effects, including anticancer and antiviral activity. Since the molecular mechanism of RES is not known, our aim is to determine the effects of RES on HCV replication and HCV-induced carcinogenesis. We have used a GS5 hepatoma cell line that harbors a subgenomic HCV replicon to investigate our goal. Cells were treated with RES or DMSO vehicle. Total HCV RNA was detected by real-time RT-PCR. Western blot was carried out to analyze viral and cellular proteins including hepatic markers and cancer stem cell-related proteins. Cell viability was determined by MTS assay, and cell cycle analysis was performed using flow cytometry with PI staining. Confocal microscopy was performed to examine cytoskeletal changes. RES significantly inhibited cell growth in a dose-dependent manner and reduced HCV polymerase expression and total HCV RNA. Additionally, RES downregulated the expression of alpha-fetoprotein, a liver cancer stem cell marker. Our findings suggest that RES may be a promising therapeutic agent for HCV and HCV-induced carcinogenesis.
05.03.26 Molecular Scatology Using DNA Barcoding: Genetic Identification of Zoological Specimen and Diet Using Mitochondrial and Plastid Loci

Diana Spencer, Andrew Brown, Bobby Daugherty, Hunter Bearden, Mang Chang, Minji Sohn,

Tulsa Community College

Identification of species through noninvasive sampling removes the need to handle free-living organisms, and is particularly valuable for large carnivores or elusive species. Determination of diet and species identification success is critical to understanding the ecosystem. DNA barcoding has emerged as a powerful tool to supplement traditional methods of taxonomy. Cytochrome c Oxidase Subunit I (COI), a highly conserved 650 base pair segment of the mitochondrial genome, has become a ‘global standard’ to sort out broad taxonomic diversity in animals. This region is not ideal for botanical specimen as it has a slower mutation rate in plants. The Consortium for the Barcode of Life (CBOL) recommended the 2-locus combination of rbcLa and matK for plant barcoding. Our research goal was to compare a variety of DNA from feces samples to identify the organism and evaluate diet content. The DNA was extracted using a fecal DNA kit and quantified using spectrophotometry. Following PCR and gel quantification, the amplified DNA was purified and sequenced. The sequence analysis was performed by Clustal W and divergence was calculated using MEGA. Our findings show that the regions and methods chosen can effectively identify species and diet content while some prey contamination compromising the overall performance was indicated.

05.03.27 Quality Control of Undergraduate Researchers: A Cautionary Tale

Paul Stone, Chelsea Smith,

University of Central Oklahoma

Undergraduate participation in research has increased dramatically in the past decade. This trend has a host of positive benefits for undergraduate and graduate students, faculty, and institutions. However, because undergraduates are relatively inexperienced at conducting research, there should be a system of quality control in place that ensures against increasing error rates associated with data collection. Our lab is heavily involved in undergraduate research. We are committed to placing talented undergraduates in positions where they collect and analyze their own original data, and report the results in peer-reviewed journals. We are also committed to quality control. Here, we report two case studies that underline potential problems with quality control of data collected by undergraduate researchers. In both cases the undergraduate students that were primary data collectors had been working in our research lab for longer than one year and were recognized as leaders in undergraduate research in our department. In both cases, another student was asked to inspect the data generated by the undergraduate student, and in both cases many errors were found. Error rates were 61% of all samples in one case, and 55% of all samples in the other case. These results underscore the need for quality control during data collection, particularly when the person responsible for data collection is relatively inexperienced.
05.03.28 Effects of Lycopene in Watermelon Extracts on Tissue Culture Cells.

Teresa Golden, Cori Brannock, Rebekah Ritchie,
Southeastern Oklahoma State University

Lycopene is an antioxidant from the carotenoid family of phytochemicals produced in plants. It is recognizable as the red color in fruits and vegetables such as tomatoes and watermelon. Unlike many carotenoids it lacks a terminal beta-ionic ring and provitamin A activity. It is absorbed and distributed throughout the body by the circulatory system. It is the focus of nutritional and clinical studies for prevention of prostate cancer and cardiovascular disease. Antioxidant properties of lycopene are well known, but other mechanisms of action have been indicated. We are using tissue culture to further examine the roles of lycopene including the effects on cancer cell growth and potential protective roles in response to stress. In these experiments we applied watermelon extracts with known lycopene and carotenoid contents to lung carcinoma cells or normal human fibroblasts. Cells were stressed (UV or starvation) and then assayed for survival rate and protein signaling changes.

05.03.29 Scleral Ossicle overlap patterns in testudines as evidence of evolutionary divergence and specialization

Ali Siweckyj,
East Central University

Scleral ossicles are a ring of thin bony plates found in most vertebrates, especially reptiles. The scleral ossicles of turtles are of interest in that they are utilized in both aquatic and land habitats. This dual use leads to some questions about the ability of these ossicles to aid in the accommodation of the eye in different habitats. This study focuses on the sclera ossicle overlap pattern and number of imbrications found in turtles. The number of ossicles in turtles is not always the same in left and right eyes of the individuals. Each ossicle consists of multiple plates that overlap, or imbricate, each other. 319 individual turtle eyeballs were examined for this research. The number of plates per eye ranged from 8 to 14, and the number of imbrications ranged from 1 to 5. From our data, we calculated percent difference in imbrications of right and left eye of individuals. This allowed for comparisons between individuals with and between species. The number of ossicles was examined to determine if there is a an evolutionary component to the number of ossicles found in different species of turtles. Ontogenetic and evolutionary considerations between and within species of the entire turtle clade is of interest to this study.
05.03.30 Light Rhythm Influence on the Growth and Perithecia Synthesis of Chaetomium Globosum, a Common Indoor Mold.

Shubhra Poudyal, Charles Biles,

East Central University

Chaetomium globosum is a fungus commonly found in water-damaged buildings and was one of the most prevalent fungi associated with damage resulting from the Katrina hurricane. The ascospores and hyphae produced by C. globosum can be highly allergenic to immunocompromised people and has been reported to cause more severe respiratory health problems. Light plays a major role in growth and reproduction in several organisms and is a major determinate in circadian rhythms of mammals. Chaetomium globosum 5 mm hyphal plugs were transferred to potato dextrose agar media plate. Isolates of C. globosum were exposed to light rhythms; continuous dark, continuous light, 12 h light/12 h dark, 6 h light/18 h dark, and 3 h light/21 h dark. Growth was measured every 7 days. The ascospores and perithecia were measured after 21 days. Results indicated that growth was not significantly influenced by different light rhythms, but ascospore and perithecia synthesis was greater in the dark when compared to light treatments. Ring patterns of fungal perithecia growth was evident on the 12 h light/12 h dark, 6 h light/18 h dark, and 3 h light/21 h dark, suggesting that light/dark cycles stimulate a circadian-like rhythm. Proteins were extracted from C. globosum grown on PD broth cultures exposed to the light rhythms previously described. The continuous light treatment stimulated a unique protein that was approximately 25 kD. All treatments that included a dark sequence showed unique bands at 15 kD.

05.03.31 Overview of Oriental Medicine “Ginseng”

Faith Fennell,

Northeastern State University

The major difference between Oriental and Western or better still allopathic medicine is that the former is rooted in traditional culture, while Western medicine is part of modern empirical science. Western [allopathic] medicine turns to be popular in today’s society and for that matter, people tend to doubt the efficacy of Oriental medicine. It is not surprising that in today’s China, Chinese medicine is often debated. In the past 5,000 years, Chinese people have been dependent on Oriental medicine to cure diseases and to protect themselves against epidemics. Consequently, Oriental medicine has contributed to population growth throughout history. There are over 300 types of traditional medicines on the globe, however, Oriental medicine has become increasingly popular. It is not just hear say that oriental medicine is effective but rather the effectiveness of oriental medicine can be seen from the growing number of people around the world who choose to study it. By definition, Oriental medicine is a set of practical skills targeting a full array of diseases, from the common cold to more serious ones, such as tumors and heart disease. This poster highlights some advantages and disadvantages of using ginseng for treating ailments.
05.03.32 The Response of Fusarium Oxysporum Growth and Conidia Production to Light Induction.

Rajya Maharjan, Charles Biles,

East Central University

Fusarium oxysporum is a common plant pathogen and also causes several human diseases. The effect of light pulses has been shown to effect the growth and reproduction of several organisms. We conducted experiments to investigate the effect of light on Fusarium oxysporum. Plants were inoculated with the fungus and placed under light banks with regimes of 3hr light (L)/21 hr dark (D), 6 hr L/18 d, 12 L/12 D, and 24 L, and 24 D. The hyphal growth was measured every 7 days and the conidia production was quantified after 21 days. Growth was not significant among the treatments. However, conidia were most abundant in the 24 L treatments, approximately 35% greater when compared to the other treatments. A higher level of pigmentation was observed in the 24 dark after 14 days of incubation. Future experiments will attempt to isolate light induced proteins that may play a role in conidia development.

05.03.33 Investigation of the Large-Scale Functional Brain Networks Modulated by Acupuncture

Zinar Simsek,

Northeastern State University

Acupuncture is an ancient Chinese healing technique, used to treat various illnesses for thousands of years. Fine, sterile needles are applied to specific areas of the body, or acupoints, to stimulate energy flow (or "chi"). The needles are usually left in place for a few minutes (skilled acupuncturist causes virtually no pain). Energy is believed to circulate throughout the body along specific pathways called meridians. When energy is flowing freely through the meridians, the immune system is stimulated, which is thought to bring on a healing response and balance. In recent years, it has gained great popularity as an alternative and complementary therapeutic intervention in the Western medicine. Noninvasive functional magnetic resonance imaging (fMRI) techniques have provided new insights into the anatomy and physiological function underlying acupuncture. This study investigated the functional correlations throughout the entire brain during the post stimulus resting period following acupuncture at acupoint ST36 (ACUP) in comparison with acupuncture at nearby non acupoint (SHAM). It divided the whole brain into 90 cortical and subcortical regions and constructed functional brain network for each condition. Then work hubs were examined, and statistically significant differences were identified by comparing the correlation coefficients of each pair between two conditions [17,19,20]. This allowed exploration of how the large-scale resting brain networks are modulated by acupuncture.
**05.03.34 Neuroprotective Effects of a New Skin Care Formulation Following Ultraviolet Radiation**

Kimberly Pahsetopah,

*Northeastern State University*

Ultraviolet radiation is an environmental factor that has major effects on the human body. Not only is it associated with photo-ageing, but prolonged UV exposure is responsible for significantly reducing the number of nerve fibers in the skin. Both sympathetic and sensory innervation in the skin originate from post-ganglionic sympathetic neurons and neurons in the dorsal root ganglia. Damage to these nerves is associated with sensorimotor neuropathy, diabetic neuropathy, and neuritis. In order to combat this observation, B. L Fonseca and a team of researchers developed a formulation from Echinacea purpurea. They used E. purpurea extract enriched with antioxidants to evaluate its protective effects against UV irradiation (ex vivo). Skin samples were treated and exposed to UVA and UVB. Results indicated that nerve densities in the placebo group significantly reduced in number whereas samples treated with the test emulsion completely blocked UV related effects.

**05.03.35 Antidiabetic Effect of Transgenic and Wildtype Safflowers**

Noor Ahmed,

*Northeastern State University*

Safflower, an agricultural crop grown for thousands of years, has been utilized in Iranian traditional medicine for the treatment of diabetes. A transgenic strain of the Carthamus tinctorius plant was recently developed to produce human insulin for diabetic patients. Insulin is usually obtained from the pancreas of some animals or harvested from genetically engineered bacteria (Escherichia coli) and yeasts (Saccharomyces cerevisiae); however, these methods of insulin production are expensive and demand for this biopharmaceutical is high and expected to sharply increase. Transgenic safflowers, which can efficiently produce a higher supply of insulin at a lower cost, have the capability for meeting the climbing demand for insulin. In the study of non-transgenic safflowers, hydroalcoholic extract was isolated and used to treat diabetically induced rats to determine if it had any anti-diabetic effect. In the study of transgenic safflowers, the human insulin gene was inserted, inducing the plants to produce insulin, which was then harvested by grounding the seeds and extracting the oil.
Investigation of differential habitat use by lizards in the Wichita Mountains

Jetta Trammell, Matthew Van Sant, Cameron University

Previous work has shown the prairie lizard Sceloporus consobrinus and collared lizard Crotaphytus collaris prefer different microhabitats within the Wichita Mountains. These two lizard species might prefer different optimal temperatures. Alternatively, Sceloporus consobrinus may be selecting a habitat away from Crotaphytus collaris to avoid predation. Even though lizards are ectothermic organisms, they do thermoregulate using behavioral means and careful microhabitat selection to maintain a preferred body temperature. The body temperature of lizards is influenced by factors including air temperature, wind speed, solar radiation, conduction and organismal anatomy. Operative temperature is a thermal parameter that accounts for all of these factors. We have obtained life-sized copper lizard models and will use them as operative temperature thermometers to create a thermal map of the environment and predict which microhabitats lizards should use based on their thermal preferences. This will allow us to compare our data with previously collected data in order to describe patterns of microhabitat use of prairie lizards and collared lizards. We will use this data to test whether microhabitat selection in Sceloporus consobrinus and Crotaphytus collaris is due to differences in thermal preferences or due to an alternative hypothesis, such as predator avoidance.

Influence of historic coffee cultivation on terrestrial snail communities in the Luquillo Experimental Forest, Puerto Rico

Craig Zimmermann, Nadia Kyrylova, Renee Morse-Heenan, Rogers State University

This study investigated the influence of historic coffee cultivation on snail communities in the Luquillo Forest, Puerto Rico. Snails were surveyed in an area known to farm coffee until 1928. Snails were sampled during three summers along transects running across to plantation lines. Each transect consisted of 10 plots with 5 plots in old coffee and 5 plots in adjacent undisturbed forest. Though no difference in species richness or diversity was found between land uses, overall snail abundance was higher on the old coffee. Two common snails, Caracolus caracolla and Nenia tridens were 2-5x more abundant on old coffee. C. caracolla on old coffee also had more juveniles. Land use factors may explain these differences. Previous floristic surveys found distinct differences in tree composition and soil properties between land uses types. Soils calcium, nitrogen, and pH were also elevated in old coffee. Limestone, applied to coffee fields to raise pH, is still present and would provide calcium needed by snails for shell growth. Higher pH would hasten litter decomposition and increase available food for detritivorous snails. Higher soil N likely arose from Inga vera trees planted to shade coffee plants. Higher soil fertility would promote faster forest growth and greater litter production. Increased detrital inputs coupled with faster decomposition would enhance snail habitat.
05.03.38 The Five Second Rule

Eric Paul, Candace Fairman,
Southwestern Oklahoma State University

This research project was conducted in effort to validate the "five second rule". A common superstition, the five-second rule states that food dropped on the ground will not be contaminated with bacteria if it is picked up within five seconds of being dropped. We tested different food items: organic and inorganic, salty and sweet, and wet and dry foods. Each food item was swabbed before the experiment to determine its microbial load. We then proceeded to drop the various food items on to artificially contaminated microbe area (tile, carpet, counter, etc.) for varying time periods. The food item was again surveyed for microbial contamination after the drop. The experiments were conducted multiple times. The results of the pre-drop and the post drop swabs indicate that there was no significant difference in the bacterial load between food picked up after five seconds and the food picked up in less than five seconds. These experiments suggest that dropping an item of food on to a surface for less than five seconds, will result in contamination. We used E. coli and S. aureus as experimental microbes. We are currently working on a double dip experiment.

05.03.39 Staphylococcus aureus and Methicillin-Resistant S. aureus Among Student Athletes and Non-Athlete Students

Eric Paul, Matt Abbott,
Southwestern Oklahoma State University

Staphylococcus aureus is a microbe prevalent in the nose and on the skin of approximately 1/3 of the human population. The microbe remains benign on the surface of the skin, but when it gets under the skin through an open wound, S. aureus can cause life threatening infections. The most prevalent danger of S. aureus is the resistance it has developed to certain antibiotics, mainly to the drug class of penicillin. The most common antibiotic resistant strain of S. aureus is the Methicillin-Resistant Staphylococcus aureus (MRSA). Our focus is to compare MRSA carriers among athletes and non-athlete populations. Athletes are highly susceptible to becoming infected with MRSA because they: have much more skin-to-skin contact than most other people, typically have more abrasions than others, and share personal items more often. Our results show that the athlete population has a higher numbers of carriers than the non-athlete population using tests that include Mannitol Salt Agar test, Tellurite Agar, Coagulase, and Mueller-Hinton with an Oxacillin disc.
**Sandwich ELISA Optimization**

Leila Ndomche Kondo,

*Oklahoma City Community College*

The Enzyme-linked immunosorbent assay (ELISA) is a popular diagnostic tool to detect or quantify a protein in a liquid sample. Performing a sandwich ELISA involves two antibodies with specificity for the very same protein. Common incidences observed in sandwich ELISA procedures are often low signals, low sensitivity, high background signal due to high amount of enzyme conjugate and poor standard curve linearity and dynamic range (1). To avoid these occurrences, critical parameters of sandwich ELISA procedures must be optimized in order to obtain a reliable assay. The purpose of this study was to create a standard operating procedure (SOP) for the quantitative determination of soluble Human Leukocyte Antigen (sHLA) molecules in production crudes as well as measure activity levels in a quality control assay. The four major parameters of the assay were identified and independently evaluated. Parameter 1: the optimal coating concentration for the capture antibody W6/32 was found to be 15 µg/ml which may vary for different lots. Parameter 2: sHLA concentrations of a standard sample covering the dynamic range of the assay were chosen from 5 to 600 ng/ml. Parameter 3: the biotinylated detection antibody dilution factor was selected to be most adequate at a 500-fold dilution. Finally, Parameter 4: the enzyme-substrate (horseradish peroxidase and o-phenylenediamine dihydrochloride) development timing was chosen at 15 minutes bringing the maximum signal well below saturation.

**Conservation Triage and Sonoran Mud Turtles in the Peloncillo Mountains of New Mexico**

Chelsea Smith, Paul Stone,

*University of Central Oklahoma*

Conservation triage is a method for allocating resources to obtain the largest conservation impact. Advocates of this approach recommend concentrating resources on situations where there are serious threats but also a high probability of recovery if action is taken. However, current environmental policy and funding priorities remain focused on critically endangered species. By taking a small fraction of resources devoted to endangered species and diverting them to less extreme problems, we could perhaps reduce matriculation of vulnerable and threatened species into the endangered ranks. Sonoran Mud Turtles (Kinosternon sonoriense), listed as Near Threatened by the IUCN, are ideal candidates for conservation triage. In the Peloncillo Mountains, large populations are associated with small impoundments constructed during the New Deal. Many impoundments are failing due to siltation or dam failures, which likely threatens otherwise thriving turtle populations. We began calling attention to this problem in 2008. Neither the landowner (USFS) nor funding agencies (including TCF) could allocate resources to restoring these habitats because the problem was not considered sufficiently grave to warrant attention. During 14-28 May 2012, a group of biologists, ranchers, and private citizens began restoration efforts at two impoundments. This poster is a presentation depicting those efforts.
Buffer Manufacturing

Alayna Trujillo,

Oklahoma City Community College

Cytovance Biologics is a biopharmaceutical contract manufacturing company specializing in the production of therapeutic proteins and antibodies from both mammalian cell culture and microbial fermentation. When manufacturing buffers for the downstream process, adherence to good manufacturing protocols is mandatory to ensure product integrity. This project describes the process of buffer manufacturing in a GMP facility.

Harvesting Foreign Chloroplasts for Acquired Phototrophy

Stephen Fields, Angie Thapa, Brent Biddy, Josh Belcher, Sadiksha Khadka, Taryn Young,

East Central University

Gymnodinium acidotum is a nonphotosynthetic, aplastidic dinoflagellate that ingests and sequesters the organelles of blue-green cryptophycean algae. The sequestered cryptophycean chloroplasts remain photosynthetically active and actually support the dinophycean cells in an obligate symbiosis. Other sequestered cryptophycean organelles, including the nucleus and nucleomorph (a reduced nucleus-like structure), presumably play a role in maintaining the sequestered chloroplasts. We are currently sequencing and analyzing the transcriptome of the free-living cryptomonad and have found gene expression patterns (including nucleomorph genes) common to most eukaryotic metabolic pathways. Future studies will compare the transcriptome of free-living cryptomonads with that of dinoflagellate-sequestered cryptomonad organelles. This will aid in identifying genes that are important for the maintenance of chloroplasts in a foreign environment. We have also found that free living cryptomonads show an enhanced growth rate when cultured in the presence of supernatants from G. acidotum cultures. This raises the possibility that G. acidotum secretes stimulatory compounds for the purpose of “harvesting” cryptomonads. Specific fractions from the dinoflagellate cultures, obtained by HPLC, significantly increase cryptomonad growth. Compounds that enhance algal growth would directly impact the phytoculture technology currently used in biofuels production, improving both efficiency and yield.

A Review of Genetically Engineered Food

Dillon Cave,

Northeastern State University

Genetically-modified food have had genes altered or replaced. Genes code for proteins to be produced by the plant for many functions. Scientists can manipulate genes to gain all the positives, while expelling any negatives. Genes that provide insect and disease resistance can be incorporated into the plants genome. By genetically modifying food, scientists can provide farmers reassurance when it comes to protection, health and boosting high yields for their crops.
Are Students Experiencing Transformative Learning?

Alexandria Assaleh, Cynthia Murray, Ryan Biggerstaff, Sarah Schatz, Tracy Morris,

University of Central Oklahoma

Project SCHOLAR (Statistical Consulting Help for Organizational Leaders and Academic Researchers) is a student statistical consulting service at the University of Central Oklahoma (UCO). SCHOLAR students work under the supervision of faculty from the department of mathematics and statistics on various projects submitted from other researchers. SCHOLAR students were asked to analyze data collected from the Graduating Student Survey (GSS). Every year, students who apply for graduation at UCO complete this survey. The members of Project SCHOLAR focused their studies on the questions pertaining to Transformative Learning experiences. Through the Transformative Learning tenets, UCO aims to provide a unique learning experience for students who attend the university. These tenets are Discipline Knowledge, Leadership, Problem-Solving, Service Learning and Civic Engagement, Global and Cultural Competencies, and Health and Wellness. We are interested in the impact of these tenets on the student’s overall college experience since their implementation in 2007. We present a statistical analysis of the differences over five years with respect to items concerning the six tenets. We also examined the National Survey of Student Engagement (NSSE) completed by UCO students in 2009 and 2012. Again, only those questions related to the six tenets were analyzed, and those results were compared with the results from the GSS.

Moxibustion

Cale Fulps,

Northeastern State University

Traditional Chinese Medicine is very different from the Western Medicine to which the people in the United States are accustomed. Some of the techniques implemented are herbal medicine and acupuncture. There is also a technique that is a mixture of both herbal medicine and acupuncture called moxibustion. Moxibustion is done by placing a spongy herb called mugwort, or wormwood, on acupuncture points on the body and setting the herb on fire. There are two different methods of moxibustion: direct and indirect. In direct moxibustion, the mugwort is allowed to touch the skin. In indirect moxibustion, the burning mugwort is held near the skin without touching the skin. The mugwort is supposed to promote blood flow in the body. There are no hard results proving that moxibustion is the cure of any sickness or disease, but many ongoing studies are taking place.
Transcriptome analysis of oxygen sensing in the model organism Dictyostelium

Muatasem Ubeidat, Christopher West,

Southwestern Oklahoma State University

Dictyostelium discoideum is a powerful biomedical model organism to study developmental regulation and cellular signaling because of the ease of molecular genetics, biochemical and cell biology approaches. The developmental process of this organism depends on environmental and internal signals and can be divided into two phases; the formation of a moving slug from solitary amoeba upon starvation and the switch from a slug to fruiting body that holds the spores, for dispersal, on an aerial stalk. The slug-to-fruiting body switch (culmination) is regulated by ammonia, O2, light and other factors, possibly acting via prestalk tip cells. Studies suggested that at least ten genes are involved in transducing the signal to allow the slugs to culminate and form a fruiting body. In this study, we seek to sequence RNA in an approach to transcriptome profiling. Ax3 strain will undergo development at 21%, 12% and 5% oxygen. Total RNA will be isolated from different stages of Dictyostelium development. Poly A-RNA will be then converted to a cDNA library using adaptors attached to one or both ends. Each molecule will be sequenced using the latest sequencing technology. The resulting millions of reads will be aligned to the Dictyostelium genome and a transcription map for each condition or a stage will be created and compared. We anticipate at least 10 genes to be characterized using this approach.

A Review on The Discovery of Dendritic Cells

Miranda Anderson,

Northeastern State University

Dendritic cells are the key accessory cell used by the mammalian adaptive immune system. Their main function being to recognize antigenic material and present it to the surface of lymphocytes. In 1978 Steinman began his research by purifying dendritic cell from mice spleens. This along with mixed leukocyte reaction testing lead Steinman to first propose the idea, of dendritic cells as the accessory cell for adaptive immunity. Steinman and his team proved the importance and existence of dendritic cells. Upon this proof, opportunities for further research became endless for medicine.
**Molecular Coordination of Iron Homeostasis by microRNAs**

McKale Davis, Brenda Smith, Edralin Lucas, Elizabeth Rendina, Grant Tinsley, Ramanjula Sunkar, Stephen Clarke, Yun Zheng,

*Oklahoma State University*

Iron is an essential nutrient critical for oxygen transport, DNA synthesis, ATP generation, and cellular proliferation. At the molecular level, iron deficiency (ID) elicits a cascade of cellular events aimed at conserving iron for the maintenance of these life-preserving functions, but tissue-specific responses and metabolic adaptations to ID are not fully understood. Recently, small regulatory RNA molecules called miRNAs have been identified as an important mechanism for regulating various cellular processes. Therefore, we sought to determine the extent to which expression of miRNA is regulated in response to dietary ID and to examine their potential regulatory capacity in the adaptive response to ID. To do this, we first characterized the expression of miRNA in the livers of iron-sufficient and iron-deficient animals using a deep-sequencing approach. Results compiled from three different analyses indicate that at least ten miRNAs are differentially expressed in the liver of ID rats. Further bioinformatic analyses showed that at least two of these miRNA have predicted targets directly involved in maintenance of iron homeostasis or the metabolic adaptations to iron deficiency. Ongoing studies include in vitro validation of predicted miRNA targets using luciferase-reporter assays, and miRNA gain/loss of function analyses on the impact of cellular iron metabolism.

**Senescence Marker Expression Differs Among Foragers Classified by Blue-Yellow Color Preference and Reward-Responsiveness**

J.M. Hranitz, H. Wells, Ibrahim Cakmak, John Barthell, Jonathan Bobek, Leah Bates-Albers, Meredith Clement, Nora Hall, Talei Apted,

*Bloomsburg University, University of Central Oklahoma, American Samoa University, Loyola Marymount University, Uludag University, University of Tulsa*

Many bees exhibit flower constancy during foraging, to which the relative contributions of learning and genetics are a highly active area of research. Naive honey bee foragers differ in blue and yellow flower color preference, suggesting a genetic basis to foraging behavior. Conversely, bees also alter preferences to maximize nectar or pollen rewards. We hypothesized that gene expression affects color preference of foraging honey bees. During June-July 2010 at Uludag University (Republic of Turkey), we monitored foraging during a 60-minute behavioral assay to categorize foraging patterns of free-flying Anatolian honey bees (Apis mellifera anatolica). Bees selected from alternative reward conditions, high reward quality versus low reward quality, randomized in blue and yellow artificial flowers. Blue or yellow "constant" bees rarely visited opposing color flowers, while "reward-responsive" bees readily switched to the higher reward flower quality. We compared brain mRNA of Blue Constant (BCF), Yellow Constant (YCF), Reward-Responsive (RRF) foragers on Agilent bee arrays, using a one-way ANOVA with pairwise contrasts. Only regucalcin-like protein differed between groups (F = 30.395, p = 0.002), with two-fold lower expression in YCF versus RRF and BCF bees. Since regucalcin is linked to aging in animals, flower color choice and responsiveness to floral rewards by foraging honey bees in this study appears affected by age and environmental factors.
05.03.51 Review - Tunneling Nanotubes: Intercellular Communication, Cytoplasmic Sharing, and Pathogen Pathway

Don Curry,

Northeastern State University

Intercellular communication is of paramount importance in multicellular organisms. The best known communication routes for intercellular communication are cell-signaling through the secretion of molecules that bind to specific receptors via paracrine or endocrine pathways, molecular transfer through gap junctions, and the secretion and fusion of exosomes. Recently, Rustom et al. published information about a novel, unidirectional communication mechanism that utilizes de novo thin, 50-200nm diameter tubes spanning up to several cell diameters, that connected cells found in cultured rat pheochromocytoma (PC12) cells. Initially, the tubes, noted in vitro, were transitory. Since then, tunneling nanotubes (TNTs) have been identified in many cell types, have been shown to exist for several hours, are found to connect individual and sometimes large complexes of cells, have been found to share cellular molecules and components, including membrane organelles such as mitochondria, carry electrical signals, and have been shown to be a pathway for prion, viral, and bacterial infection. This review looks at some of the myriad research and findings of this fascinating mechanism.

05.03.58 CURE-STEM: A Model for Encouraging and Sustaining a Culture of Student-Centered Research

Charlotte Simmons, Beverly Endicott, Charles Hughes, Gregory Wilson, John Barthell, Wei Chen, William Radke,

University of Central Oklahoma

We describe characteristics of a model for encouraging faculty development and student learning through undergraduate research practices at a publicly funded predominantly undergraduate institution. The Center for Undergraduate Research and Education in Science, Technology, Engineering and Mathematics, or CURE-STEM, incorporates best practices from a now burgeoning literature on undergraduate research and has yielded a positive fiscal return on investment in faculty members who support student-centered research activities.

05.03.59 Globalization, Undergraduate Research, and Persistence to Graduate School

John Barthell, Charles Abramson, H. Wells, J.M. Hranitz, J.R. Redd, William Radke,

University of Central Oklahoma

Kuh’s introduction of High-Impact Educational Practices (2008) has encouraged a nation-wide convergence of efforts to align institutional missions with best practices in higher education in order to increase persistence by students toward their career goals. However, achieving the alignment with the effective collaboration of administration, faculty, and students can be challenging during the implementation process. We detail a seven-year process of incorporating experiential learning activities, termed Transformative Learning, into the university mainstream, citing an example of the integration of global competency activities with an international research program.
Characterization of Three Major Histocompatibility Complex Class II Loci in Neotoma albigena

Lindsay Stone,

University of Central Oklahoma

The major histocompatibility complex (Mhc) is an important component of vertebrate immune systems. Genetic analysis at Mhc loci can provide information on susceptibility to certain viral strains. Neotoma albigena (white-throated woodrat) has been associated with at least three distinct strains of arenaviruses, suggesting an interesting coevolutionary history between the host and virus. In this study, we have been screening three Mhc class II loci to detect genetic variation within N. albigena subpopulations in Arizona. We hypothesize that specific alleles for each locus will be positively correlated with disease susceptibility. Initially, we screened two loci using capillary electrophoresis-based single strand conformational polymorphism (SSCP) analysis. Using this method, we found moderate levels of genetic variation at the loci and little correlation between disease susceptibility and alleles. Due to SSCP optimization issues, we have added a third locus and are sequencing the alleles to confirm their identity. We have optimized the protocol and our results indicate we have successfully screened the Mhc loci for genetic variation. The methods used in this research, as well as previous findings, will be applied to collaborative research project with Texas Tech University and the University of Texas Medical Branch involving the association with N. albigena and arenaviruses.

Proliferation of Myofibroblasts using 5-ethynyl-2′-deoxyuridine (EdU)

Tobi Odejimi, Julie Hamilton, Melville Vaughan,

University of Central Oklahoma

The purpose of this experiment was to test 5-ethynyl-2′-deoxyuridine’s effectiveness in immunofluorescently labeling myofibroblasts. 5-ethynyl-2′-deoxyuridine (EdU) is a unique nucleotide that binds to DNA during S phase of cell cycle in DNA replication. This will be accomplished by treating different carpal tunnel cells: CT4HTERT, CT4 young, and CT4 old cells with EdU to identify if the DNA replicated. These are normal adult fibroblasts cells that have been surgically removed from patients. The reason fibroblasts are being used is because fibroblasts synthesize extra cellular matrix and collagen in animal tissues. When a person incurs a wound fibroblasts are signaled to approach the wound, proliferate, and differentiate in order to help close the wound close. Fibroblasts differentiate to form cells called myofibroblasts, which express alpha-smooth muscle actin, which greatly aids the contraction of wounds(Vaughan et al., 2000). Previous research has shown that myofibroblasts most likely do proliferate to a small degree and that transcription growth factor beta affects the amount of proliferative myofibroblasts present. In this experiment we accomplished understanding how the amount of time given to let the EdU bind to the DNA affects the experiment and adjusted the current EdU assay accordingly to make it more effective for studying fibroblasts and myofibroblasts.
05.03.62 Quantitation of Total Human and Human Male DNA Using Real-Time PCR

Lyndsey McNeil,

Oklahoma City Community College

The Plexor® HY System is a system designed to simultaneously quantitate total human and human male DNAs utilizing a real-time PCR system. The use of PCR primers labeled with quenchers and fluorescent dyes allow this to occur. A series of assays were ran under conditions specified by the manufacturer, and analyzed using the Plexor® Analysis Software. The objective of this study was to determine the amount of human autosomal and Y DNA within a sample using the kit provided by Promega. The Plexor® HY System uses modified nucleotides to accomplish quantitative PCR Analysis. One of the two primers contains the nucleotide iso-dC, tagged with a fluorescent label. This primer is located on the 5’ end. The reaction mix contains Dabcyl-iso-dGTP and deoxynucleotides. Dabcyl is a weak quencher that is integrated opposite the iso primer during the annealing and extension process. Dabcyl-iso-dGTP executes the quenching of the fluorescent tag on iso-dC, which is located on the complementary strand. Measuring the amount of fluorescence allows quantitation during the while amplification process.

05.03.64 Plant Competition and Perturbation within an Aegean Pollination System


University of Central Oklahoma

Flowering plants use nectar and other rewards to compete with one another for pollinators. The ability to consistently attract bees, for example, is often mediated by nectar standing crop levels within and between species. Yellow star-thistle, Centaurea solstitialis, effectively competes for honey bees and other such pollinators in the western USA where it produces relatively high nectar standing crops. In its native range, including in the Republic of Turkey and Greece, however, honey bees are less common at flowers. We used a perturbation experiment to explore this phenomenon, by recording visitation rates of flying Hymenoptera (bees, wasps, etc.) observed in plots of C. solstitialis on the Northeast Aegean Island of Lesvos, Greece. We did so by introducing flowers of its sympatric competitor, chasteberry or Vitex agnus-castus into transects of C. solstitialis. The results demonstrate that even a short-term introduction of V. agnus-castus (with high average standing crop nectar volumes) will disrupt visitation patterns of pollinators to C. solstitialis. This effect suggests that the range expansion of newly introduced flowering plant species, especially those requiring outcrossing such as C. solstitialis, may be directly related to the competitive landscape these species encounter upon arriving in new environments, or just being lucky.
05.03.65  Plant Biotechnology

Mohammed Shaban, Kevin Wang,

Northeastern State University

Biotechnology has become a lot more popular in the present day. It has become a field of study that more people are looking into and learning new material about. What is Biotechnology? The term biotechnology means to use living organisms or their products to assist in the industry of either, agriculture or pharmacy (“What is Biotechnology”). In my paper, I will focus on plant biotechnology and pharmaceutical biotechnology. I will also focus mainly on antisense gene technology for both, agricultural and pharmaceutical reasons. The population is increasing at an incredible rate, which means the demand for food is also growing. As a result of the increased demand for food, we need to increase crop production. In order for crop production to keep up with the population growth, plant biotechnology must step in. Plant biotechnology encompasses the manipulation of the plant genome to make the plant or products more useful (“Plant Biotechnology”). Plant biotechnologists, people that work in the field of plant biotechnology, use plant transgenesis. Plant transgenesis means to transfer genes directly to plants. Plant transgenesis has many different methods, including conventional selective breeding and hybridization, cloning, protoplast fusion, gene guns, and antisense gene technology (Thieman 159).

05.03.66  Pollinator Type and Size Varies According to Nectar Standing Crop within American and Eurasian Island Ecosystems

John Barthell, H. Wells, J.M. Hranitz, J.R. Redd, T. Petanidou, Victor Gonzalez,

University of Central Oklahoma

The response of pollinators to nectar rewards by plants can correlate with variables such as body size within species and morphological and behavioral differences among species. We tested for a relationship between body size of bee pollinators and nectar standing crop levels in populations of the highly invasive plant species yellow star-thistle or Centaurea solstitialis. Our findings show significant differences in average bee body size as sampled from plots of C. solstitialis with differing average nectar standing crop levels. Large-bodied bees visited plots with relatively high standing crops more often than small-bodied bees, a finding that is consistent within and between the island ecosystems where the plant is native and non-native: Lesvos (a Northeast Aegean Island in Greece) and Santa Cruz Island (among the Channel Islands in the USA), respectively. Taxonomically, honey bees show a preference for high nectar standing crop plots as do other large-bodied species in the family Apidae; small-bodied solitary bees in the families Megachilidae and Halictidae are more common in low nectar standing crop plots. These observations are reviewed in the context of plant competition with implications for biological invasion.
05.03.67 Impact of Hand Washing Instructions on Hand Washing Practices at the University of Central Oklahoma.

Robert Brennan, Allison Coleman, Amber Bragg, Brendon Yuill, Chelsea Smith, Emily Shackelford, Jayci Fleming, Jing Herwig, Joseph Proffer, Kalen Cesar, Khabbab Amin, Mike Braden, Peter Drevets, Quinn Gorges, Shey Ramsey, Veronica Smith,

University of Central Oklahoma

Washing hands with soap and water has long been considered an effective way to reduce the spread of infectious disease, yet hand washing compliance has historically been low, even in health care institutions. Studies conducted in health care institutions have shown that compliance can be improved with intervention, principally through the potential for punishment. In a public setting, the threat of punishment is not a viable option; therefore other methods are employed to promote hand washing compliance. The hypothesis was that placing instructions in the rest rooms would significantly improve hand washing practices on the UCO campus. Over a period of two months students from the course observed hand washing practices in various restrooms on the UCO campus before and after hand washing instructions were placed in the restrooms. The percentage of subjects who washed their hands according to the Center for Disease Control (CDC) recommendations improved from 23% to 27% after hand washing instructions were placed in designated restrooms. This improvement was not statistically significant and indicates that placing signs in restrooms is not sufficient to improve hand washing practices on the UCO campus. This study was carried out as part of an active learning exercise in a Microbiology for Majors course in the fall of 2012 after students had completed the NIH training for Protecting Human Research Participants and under IRB approval.

05.03.68 Optimization of Protocol for Histidine-Tag Specific Capture for Standard Biosensor Surface

Jordan Evans, Skylar Snowden,

University of Central Oklahoma

Presented here is the optimization of the solid state linkage of a chelating agent for the reversible immobilization of a poly-histidine tagged protein using the SensiQ Pioneer SPR (surface plasmon resonance) biosensor. NTA ligand [Nα, Nα-Bis(carboxymethyl)- L-Lysine hydrate] was covalently linked to carboxymethylated dextran on the biosensor chip and treated with Ni2+ prior to injection of a hexa-histidine peptide and a his-tagged protein. Various conditions were tested to optimize both the linkage of NTA to the surface and of peptide/protein capture amounts, including: pH, buffer components, NTA concentration, surface activation contact time, and wash conditions. Each condition exerted some influence on the covalent attachment of NTA to the dextran surface, with the most potent conditions being activation contact time and pH of the NTA solution. Peptide/protein capture response was positively correlated to the amount of active NTA ligand conjugated to the dextran surface. An optimized protocol for the construction of a stable and repeatable chelating agent for his-tagged protein immobilization was established, thus enhancing a methodology of biomolecular interaction analysis for SPR biosensors.
**05.03.69 The Effects of Freeze-Dried Watermelon on Bone Parameters of Ovariectomized Mice**

Maryam Mahmood, Brenda Smith, Connie Ketz-Riley, Edralin Lucas, Heba Eldoumi, Kayla Castleberry, Maureen Meister, Penelope Perkins-Veazie, Stephen Clarke,

_Oklahoma State University_

The role of fruits and vegetables in the prevention and treatment of chronic diseases such as osteoporosis are continuously being explored. The purpose of this study was to investigate the dose-dependent effects of freeze-dried watermelon in the prevention of bone loss in ovariectomized (ovx) mice, a model of postmenopausal osteoporosis. We hypothesized that compounds in watermelon such as lycopene and citrulline would help prevent bone loss in ovariectomized mice. Three month old C57BL/6 female mice (n=68) were sham-operated or ovx and randomly assigned to six treatment groups for 12 weeks: sham-control, ovx-control, ovx + 1%, 10% or 25% (w/w) freeze-dried watermelon (WM), or ovx-control with alendronate injection (100 ug/kg body weight). All diets were isocaloric, isonitrogenous and had the same calcium and phosphorus concentrations. The 25% WM group had significantly higher final body weight and % body fat compared to the ovx-control group. Additionally, watermelon was not able to prevent the decrease in whole body and tibial bone mineral content due to ovariectomy. Our preliminary data indicates that watermelon might not be a suitable dietary option for preventing post-menopausal osteoporosis.

**05.03.70 Eastern Medicine: Acupuncture**

Ahmed Zendah,

_Northeastern State University_

Eastern medicine is almost a widely accepted form of treatment and is popular with people of the western world today. Specifically, traditional Chinese medicine is one of the most common practices used in the United States. Chinese medicine concepts have been formulated and practiced for over 2,000 years, several forms of these medical practices include acupuncture, herbal medicine, and simple massage. Acupuncture treats patients by using small, thin needles and inserting them into stimulating points on the human body. There are studies that reveal that some acupuncture treatments help with some musculoskeletal conditions and pain, however, other studies say this form of treatment is nothing more than a placebo effect on humans, acupuncture is an ongoing controversial subject.
Foraging Strategies in the North American Honey Bee (Apis mellifera): Forensic Applications and Analyses

JeAnna Redd, Alexa Prim, Alexia Gonzalez, Emily Webb, Jessica Price, John Barthell, Jordyn Vargas, Michael Jordan, Thomas Jourdan, Wayne Lord, Yoselin Vallejos,

University of Central Oklahoma

Honeybees (Apis mellifera) have a remarkable sense of olfaction and are direct descendants of wasps. Wasps are predatory insects whose diets consist of other insects and carrion. This study sought to determine whether or not those odor detectors can be redirected from floral attractants to carrion. Cinnamon scent was used as a control and S-methylthiolacetate was used as the treatment carrion odor. For each odor, bees were trained by exposure to the scent in the mouth of the hive for one to two days prior to experimentation. Three feeding stations were set up equidistant from the hives and each other. Two of the feeders consisted of a 1.5M sucrose solution and scent was added to the third feeder with sucrose solution. Within 15 minute intervals, the number of bees feeding at each station was tallied. Upon conclusion of the timed intervals, the stations were moved to the next location. This was repeated until the scented station had been in each feeding location. Each trial was repeated at 25m and 50m. For both odors, the bees showed a trend of visiting the feeder containing the scent with which they were trained. This study has far reaching forensic/economic implications. Within forensic science, animals have long been used to detect carrion. However, none have been as inexpensive and as easy to train as honeybees have the potential to be. Training honey bees to detect carrion would alleviate much of the time, cost, end energy required to train other animals.

A Look at Eastern Medicine

Rebecca Wagner,

Northeastern State University

Eastern medicine is rooted deep in tradition, dating as far back as the Shang Dynasty. This type of healing takes a more introspective and holistic look at treating the person for ailments of all types. A great deal of focus is placed on treating the whole person, which includes the mind, body, and the spirit. Different therapies are used to treat anything from cancer to a common headache. While there is a common belief framework consistently present throughout Eastern Medicine, there are many subtypes that sometimes use differing medical theories. The exact philosophies and techniques used can vary greatly. Overall, Eastern philosophies fall in line with working with the earth and the environment to promote a greater good for both. The people utilize the earth for healing. Traditional Chinese Medicine includes herbal medicine, massage (Tunia), and acupuncture. Chinese Herbal Medicine diagnoses and treats based on the theories of Traditional Chinese Medicine. Acupuncture is based on using the body's natural meridians and stimulation of these points. Tunia, or massage, is a subcategory of body work, and focuses on releasing tension and blockages in the body. Tunia is typically used in conjunction with acupuncture to yield maximum positive results.
05.03.73  Altered TNF-Alpha And IL-10 Cytokines In Bladder And Kidney Of Mice With Increased Uropathogenesis

Sepideh Darbandi, Anil Kaul, Rashmi Kaul, Richard Glass,

Oklahoma State University

Introduction: Proinflammatory TNFα and anti-inflammatory Interleukin (IL)-10 cytokines play an important role in innate immune responses during uropathogenesis. Early cytokine activation events that occur in the bladder immediately following urinary tract infection (UTI) are poorly understood. Evidence from our lab shows that estrogen and estrogen receptor alpha deficiency are important susceptibility factors in UTI pathogenesis as observed in estrogen receptor alpha (ERα) gene knock-out (KO) mice. We hypothesize that ER alpha disruption alters TNFα and IL-10 induction in the bladder contributing to adverse UTI outcome. We studied the kinetics of TNFα and IL-10 in the bladder and kidney of ERα KO and wild-type (WT) mice at 2 and 7 days post UTI by Dr E. coli. Methods: Protein immunohistochemistry was performed in paraffin embedded kidney and bladder tissue sections from infected mice using HRP-DAB system. Results: TNFα was predominantly seen in the cells of transitional epithelium of the bladder and IL-10 expression was found in both bladder smooth muscles and uroepithelium. ERα KO mice showed delayed induction of proinflammatory cytokine TNFα, but increased anti-inflammatory IL-10 production in both bladder and kidney at the early time point resulting in adverse UTI outcome in these mice. Conclusions: Timely induction of both TNFα and IL-10 at the early onset of UTI is crucial. Therapeutic modulation of TNFα and IL-10 may se

05.03.74  Increasing the precision of measurements for tension generation by precancerous cells, Ker-CT-Ras,

Jessica Webb, Anna Graves, Melville Vaughan,

University of Central Oklahoma

Recent research activity has focused on the tumor stroma, the microenvironment surrounding cancers. Tumor stromas are typically connective tissues containing fibroblasts and myofibroblasts, cells that are elsewhere required for wound healing responses. There is evidence that myofibroblast presence in tumor stromas leads to poor prognosis. Factors that enhance differentiation of myofibroblasts include TGF-β, ED-A fibronectin, and mechanical tension. Our study focuses on the ability of Ker-CT-Ras to generate tension in a dermis-like environment and compares that ability when the cells are treated with TGF-β. This study used Grinnell's stress relaxation collagen matrix model, a model that acts like a wounded dermis; that is, it provides the necessary microenvironment for myofibroblasts. Its use is mostly for looking into the properties of fibroblasts, cells native to the dermis. Our lab has also taken to using it in the research of invasive cells, called Ker-CT-Ras. The release method for these cells is more tasking. Ker-CT-Ras lattices have higher occurrence of wrinkling and folding. In this study, I look for an optimal day for release of lattices with half the cell concentration previously used.
05.03.75  Molecular Pharming with Transgenic Plants

Zach Zaaza,
Northeastern State University

The field of molecular pharming is a vastly growing field in terms of research and popularity. Molecular pharming is a breakthrough because it allows researchers to develop affordable medicines with easy availability for the rest of the world, primarily in under-developed countries where the acquisition of medicine and medical treatment is rare. Researchers at St. George Medical School Hospital in London are working feverishly to find different ways to develop these medicines and vaccinations to provide to those parts of the world. In this presentation, we will discuss the current progress that has been made in the field of molecular pharming with transgenic plants, and the research that will be conducted in the future.

05.03.76  The Study of Azoreductase Enzymes in Human Intestinal Bacteria

Taylor Dismuke, Shanel Byron, K.J. Abraham,
Langston University

Azo dyes are widely used in the pharmaceutical, textile, food, and cosmetic industries. Azo dyes are characterized by containing one or more azo groups and are the largest and most versatile class of dyes. Azoreductase enzymes catalyze the reductive cleavage of azo linkages to produce aromatic amines, many of which are carcinogens. The purpose of this study is to investigate the presence and activity of azoreductase enzyme and Enterobactor aerogenes and Sarcina aurantiaca and isolate the azoreductase gene coating for the enzyme. Genomic DNA was extracted from both E. aerogenes and S. aurantiaca using a standard extraction procedure. DNA extracted from both bacteria were analyzed using polymerase chain reaction. Future studies include DNA sequencing and nucleotide analysis of the azoreductase gene.

05.03.77  The Further Study of n-Acetyl Cysteine (NAC) Effects on Cell Proliferation and Phenotype

Jing Herwig, Melville Vaughan,
University of Central Oklahoma

Antioxidants such as NAC are shown to reduce the contractile properties of fibroblasts. Fibroblasts are found in most pathological contracture diseases and play an important role in wound healing. Many studies have reported that NAC decreases fibroblast differentiation into myofibroblasts in response to transforming growth factor beta (TGF-β). Our recent research studied the effect of NAC on cell proliferation induced by TGF-β. We have already shown that NAC can block the TGF-β effect on fibroblasts and the production alpha-smooth muscle actin in a stress-relaxed collagen lattice model. Furthermore, two distinct cell phenotypes were observed in relation to the amount of tension present. To further study the effect of NAC on cell proliferation and confirm the reversal of NAC on TGF-β effect, we will delay the treatment of NAC after having stimulated the myofibroblast phenotype with TGF-β for 2.5 days. The contraction of fibroblasts will be measured in a stress-relaxed collagen lattice model and the cell proliferation and cell phenotype will be studied on coverslips via the measurement of cells in S-phase with the 5-ethynyl-2′-deoxyuridine (EdU) method. Our results in the collagen lattice model have displayed decreased contraction of fibrob
**05.03.78 Hyperglycemia Affects IL-6R Function in Skin**

**Megsn Bowlin,**

*Langston University*

Non-healing wounds are a significant problem for health professionals. Diabetic wounds appear to be a self-sustaining inflammatory phase. Interestingly, the inflammatory cytokine IL-6 is necessary for wound healing. While it is known that IL-6 is dysregulated in diabetes, little is known concerning the function of IL-6 or its receptor in diabetic wound healing. Gene expression was determined by QPCR, Western blot, or ELISA. ERK ½ phosphorylation was determined by ELISA. L-6 and IL-6 expression are disparately modulated in wounds from diabetic animals. Conversely, neither RAGE mRNA nor protein is induced by RAW cells cultured in low glucose at >1 ng/ml rmIL-6. However, 25 mM glucose exposed RAW cells induce Rage mRNA and protein less than or greater to 10 ng/ml rmIL-6. In conclusion, Hyperglycemia alters the function of the IL-r while not affecting its expression in skin cells. IL-6 and hyperglycemia can modulate RAGE expression in fibroblast and RAW cells. This interaction may affect IL-6R function in diabetic wounds.

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**05.03.79 Chinese Cupping Therapy**

**Kandace Hockett,**

*Northeastern State University*

Cupping is a lesser known form of alternative medicine. The Chinese believed that you have pathways that energy flows through and there is 5 main ones located on the back so this is mainly performed on the back. Its a process of placing glass bulb-like cups that are suctioned to the back. There is two types, wet cupping and fire cupping each giving different benefits. The Chinese believe that cupping can help treat various diseases, increase blood flow and remove toxins to help achieve good chi.

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**05.03.80 Tensional Homeostasis in an Invitro Wound Healing Model**

**Chelsea Spencer, Melville Vaughan,**

*University of Central Oklahoma*

In normal wound healing conditions myofibroblasts, contractile cells, are found. During the aging process, healing of wounds is slow which could be from the myofibroblast absence or inability to function. Tension generation is necessary in the healing process; collagen lattices used as an experimental model mimic the environment produced from cells that are under tension in a matrix. My prediction was that tension would be generated all the way to a maximum and then drop back down to match the days before. I used collagen lattice models to test day by day how tension homeostasis changes when given different amounts of time to generate. My results showed that tension reached a maximum after 6 days, then it lessened after that. More experiments will be done to reassure these results. The results from the experiment agree with the predictions made earlier. By understanding tension generation changes using collagen lattice models, we may understand the aging process and how long it could take for the aging generations to heal and also the way that this could occur.
Natural Compounds and Antibacterial Activity in a Species of Mentha

Lindsay Davis, Eliza Payne, Morgan James,

Langston University

Natural compounds from plants are used in medicine every day. Efforts are made to study antibacterial compounds from different sources including plants. The major predominant active chemicals in plants tested were phenolics that showed a great deal of medicinal effect. Past research on antibacterial activity were examined using several different methods and has not been consistent. The objective of this research was to analyze the leaves of a species of Mentha for antimicrobial activity. Mentha plants are also known as mint and are aromatic and grown in wet environmental conditions. The hypothesis is that the compounds from Mentha will exhibit antibacterial activity. Leaves of the plant were dried and extracted with Methyl alcohol using the soxhlet apparatus. Crude methanol extracts were added to culture medium and assayed against Escherichia coli. Though antibacterial activity was not very evident, further tests will have to be done using different solvent extracts. Screening of the compounds will also be followed using chromatographic techniques.

Effect of Transforming Growth Factor Beta Concentration Gradient on Myofibroblast Differentiation

Mellisa Chigwedere, Melville Vaughan, Tobi Odejimi,

University of Central Oklahoma

When a person incurs a wound fibroblasts are signaled to approach the wound, proliferate, and differentiate in order to help close the wound close. Fibroblasts differentiate into myofibroblasts. This occurs mainly by mechanical tension and Transforming Growth Factor Beta inducing the cytoskeleton to reorganize itself. It has been shown through research that Transforming Growth Factor Beta 1 promotes the morphological changes and function of myofibroblasts. Transforming Growth Factor Beta is a protein secreted by certain cells that plays a large role in differentiation and proliferation in cells. There have been many experiments using Transforming Growth Factor Beta to induce fibroblast differentiation. In this experiment we plan to investigate what concentration of Transforming Growth Factor Beta is best for experiments with myofibroblasts. The usual dose used in our lab is 1 nanogram per micro liter because this is what has been experimentally found to be low but effective dose. This experiment varied the concentration in order to find if there was a certain concentration that yielded the best results.
05.03.83 Personal Research Review on: Plant Breeding

Mohamad Al-Rifai,

Northeastern State University

Plant breeding, a field of biotechnology, is an optimistic effort in creating ways to progress the production of plants to quantify the amount of food, fuel, and fiber to the limited amount of the world's sources. Moreover, throughout the years, the population has been growing at an exponential rate; thus, the need for resources is at a direct correlation with the grow, making the needs increase exponentially as well. Therefore, there are a few procedures or techniques done to change, produce, or manipulate certain characteristics in the plants. However, it has been noticed that throughout history, people of different cultures and traditions, have been using methods similar of plant biotechnology to gain their desired results. Crossbreeding and selective breeding are two examples of practices used years ago. Thus, biotechnology is purely an advanced, more scientifically complex method of the older traditions. To further exemplify the similar but more complex methods used by bio technologists, genes of plants are deleted, added or silenced to attain the sought after product. Plant breeding, a growing, complex field, has many advantages to the human population, as well as disadvantages.

05.03.84 Antioxidant Inhibition of Keratinocyte Invasion of a Synthetic Dermis

Attika Secondi, Melville Vaughan,

Rose State College, University of Central Oklahoma

Keratinocytes are skin cells located in the epidermis under normal circumstances; these cells are also involved in nonmelanoma skin cancers. The experiment performed tested the hypothesis that treating with anti-oxidants would decrease the invasion of the Keratinocytes into the more dermal layer. The experiment was set up by creating synthetic wound tissue made with skin fibroblasts and rat tail collagen. The wound samples were incubated allowing the fibroblasts to reorganize the collagen after mixing. Following this the artificial skin tissue was allowed to contract and grow in a submerged environment for 2 days. Then precancerous keratinocytes that are known to invade a setting filled with fibroblasts were placed on top to affix to the wound tissue. Then the tissues were brought to the surface of a culture media by placing in a Transwell insert that allows nourishment from below and (both controlled and treated) were grown like this for two weeks. The tissues were then collected and prepared for sectioning. The sections were stained, viewed and photographed. The stained sections suggested that antioxidant treatment had a positive effect. If given time we can see how the keratinocytes tell the difference between where they are supposed to be (epidermal layer) and where they are supposed to stop (dermis layer) or when the confusion for the cells to differentiate take place. This will be performed using standard staining techniques to identify proteins such as keratin.
Mapping Interaction Domains on Mcm10 and Mrc1 in Budding Yeast

Drew Breedlove, Chance Hendrix, Sapna Das-Bradoo,

Northeastern State University

Minichromosome maintenance protein 10 (Mcm10) is essential for chromosome replication in eukaryotic cells and has been shown to link the helicase activity (Mcm2-7 protein complex) to polymerase activity (DNA polymerase alpha) at the replication forks. All previous studies on Mcm10 implicate its importance in normal DNA replication. Our preliminary studies indicate a novel role of Mcm10 in maintaining genome stability under replication stress conditions. We have observed that Mcm10 interacts very strongly with mediator of replication checkpoint (Mrc1) in budding yeast. Mrc1 functions as a replication fork stabilizer under unperturbed replication and also as a mediator of S-phase checkpoint during replication stress. In order to better understand the role of this interaction, we have mapped the interaction domains on both these proteins. Truncations of Mcm10 and Mrc1 were constructed in yeast two-hybrid vectors. Both proteins were systematically truncated to preserve their conserved domains and interaction was studied using yeast-two hybrid assays. Our results indicate that Mcm10 interacts through its N-terminus while Mrc1 interacts through its conserved C-terminus. These results lead us to believe Mcm10 may possibly function in DNA damage response by interacting with Mrc1 on the replication fork during replication stress.

Using Fluorescence Microscopy to Investigate the Interaction Between Mcm10 and Mrc1 in Saccharomyces cerevisiae

Chance Hendrix, Sapna Das-Bradoo,

Northeastern State University

Genomic instability is a hallmark of cancer cells, so there is a continuous search for proteins that are critical for maintenance of genome stability. A previous study has identified minichromosomal maintenance protein 10 (Mcm10) and mediator of replication checkpoint 1 (Mrc1) as two proteins that play an important role in maintaining genome stability. Our laboratory’s goal is to further examine the roles of these two proteins as protectors of genomic stability. Mcm10 is an essential part of the replication fork and plays a vital role in fork stability through interactions with proliferating cell nuclear antigen (PCNA), DNA polymerase α and helicase. Mrc1 is involved in the activation of S phase checkpoint and has also been shown to interact with DNA polymerase ε. Mcm10 and Mrc1 are highly conserved proteins, so we chose budding yeast, S. cerevisiae, as a model organism. We have observed that Mcm10 interacts strongly with Mrc1 using yeast two-hybrid technique. Our next step is to study this interaction by co-localization using fluorescence microscopy. To accomplish this, we have constructed an endogenously tagged Mcm10 (YFP-Mcm10) and Mrc1 (CFP-Mrc1). Currently we are standardizing the protocols for this technique. Our future goal is to study this interaction under normal DNA replication and in the event of DNA damage.
A Review on: Expression Pattern of the Alpha-Kafirin Promoter Coupled with a Signal Peptide from Sorghum bicolor

Catherine Richardson, Northeastern State University

The increased research investigating the potential of seed-specific promoters as well as the rapid development of reproducible transformation systems has further encouraged the bioengineering of cereal plants for the production of valuable protein products in seeds. The research the authors have done for this study involved coupling promoters of seed storage α-kafirin genes with signal sequence (ss) and isolating them from Sorghum bicolor L. Moench genomic DNA. For this study, the authors used the α-kafirin promoter (α-kaf) containing the endosperm specificity-determining motifs, prolamin-box, the O2-box 1, CATC, and TATA boxes required for α-kafirin gene expression in sorghum seeds. The constructs pMB-Ubi-gfp and pMB-kaf-gfp were microprojectile bombarded into various sorghum and sweet corn explants. GFP expression was detected on all explants using the Ubi promoter but only in seeds for the α-kaf promoter. This shows that the α-kaf promoter isolated was functional and demonstrated seed-specific GFP expression. The constructs pMBUbi-ss-gfp and pMB-kaf-ss-gfp were also bombarded into the same explants. Detection of GFP expression showed that the signal peptide (SP)::GFP fusion can assemble and fold properly, which preserves the fluorescent properties of GFP.

Drosophila N-Hydro-Terminator

Robert DuPriest, Northeastern State University

The gene CG10576 is a peptidase that is found in the organism Drosophila Melanogaster but is also reserved in Homo-sapiens, knowing the Drosophila is a model organism and that the gene is a homolog, we can alter the gene in the Drosophila and justifiably assume it will have similar results in humans.

A Review of the Traditional Chinese Medicine Diagnostic Technique of Tongue Inspection

Rachel Wirginis, Northeastern State University

Traditional Chinese Medicine (TCM) is oriented toward recognizing and correcting imbalances in the flow of bodily energy, or Qi. Acceptance of TCM in the West is growing despite the fact that only a small number of TCM products or methods have been scientifically validated and techniques are not based on Evidence Based Medicine. While Conventional Western Medicine (CWM) relies on experimentation and research to determine practice some proponents of TCM explain that TCM is incommensurable with scientific methods. Many practitioners of CWM have raised concerns about the safety and efficacy of TCM practices. The traditional examination includes four diagnostic methods: inquiry, inspection, auscultation and olfaction, and palpation. Inspection incorporates “tongue diagnosis,” an assessment of the tongue and its coating. There are no known studies comprehensively evaluating the clinical diagnostic reliability of the four-part TCM examination, although, some assessments of tongue diagnosis do exist. This poster reviews available published research to address the reliability of tongue inspection and presents possible evidence of the efficacy of this ancient practice.
Treating Retinitis Pigmentosa Through Use of Stem Cell Therapy and Gene Therapy

Rebecca Wagner,

Northeastern State University

Retinitis Pigmentosa is a rare genetic disorder that severely affects vision and afflicts only about 1 in 4,000 people in the United States. This rare retinal disease involves degeneration of retinal photoreceptors, and is known to involve at least 32 genes. The disease first presents in childhood as nightblindness, and progresses to peripheral vision loss in early adulthood with eventual almost total blindness. There is not currently any effective treatment or cure for Retinitis Pigmentosa. Affected patients work with a low vision specialist using adaptive therapy that helps them adjust to living with their vision loss. Researchers are exploring using both stem cell therapy and gene therapy to treat the disease. Gene therapy involves use of a vector to implant genes that correct the genetic defect and works by preventing further deterioration of existing photoreceptors. Stem cell therapy is providing treatment for patients whose retinal cells have already degenerated by providing new, healthy cells in their place.

Desmodus rotundus (Vampire Bat) Salivary Plasminogen Activator as an Alternative Treatment for Ischemic Stroke

Ian Schalo, Frank Yau, Kevin Wang,

Northeastern State University

Someone in the United States suffers a stroke every forty seconds; 85% are ischemic strokes. An ischemic stroke occurs via a clot impeding blood flow to the brain. To treat this dangerous condition, doctors must administer recombinant tissue plasminogen activator (tPA) within 4.5 hours to dissolve the clot and restore blood flow to the brain. Although tPA is effective, it also bears significant neurotoxicity. As such, a more effective approach is sought. Desmodus rotundus salivary plasminogen activator α 1 (DSPAα1), an anticoagulant in vampire bat saliva, is currently being investigated for its thrombolytic properties. DSPAα1 is known to antagonize vascular tPA-induced neurotoxicity by competitively binding to low-density lipoprotein related-receptors at the blood-brain barrier. DSPAα1 is currently undergoing clinical trials. DSPAα1 shares 345 identical amino acid positions with tPA, with an identity of 61.3%. Though DSPA α1 is in clinical trials, DSPAα2 is already being optimized for production in plants. DSPAα2 shares 427 amino acid positions with DSPAα1, maintaining a similarity identity of 89.5%. When comparing DSPAα2 to tPA, 354 amino acids are found to be shared with an identity of 62.87%. Due to the similarity, DSPAα2 may be an effective thrombolytic agent. The ability to produce this protein in plants could effectively lower the cost and risks associated with current strategies for treatment of ischemic stroke.
05.03.92  The Effect of Telomerase on Dupuytren’s Disease Myofibroblasts Migration and Differentiation

Dima Sawalha, Melville Vaughan,

*University of Central Oklahoma*

Dupuytren’s disease is characterized by shortening of the palmar fascia leading to digital flexion deformity. It is associated with thickening of the tissue underneath the skin. Several studies suggest that mechanical forces in the tissue with TGF-β plays a significant role in the differentiation of the myofibroblasts. Myofibroblasts disappear during scar formation by programmed cell death (apoptosis). The purpose of this study is to determine if hTERT immortalized myofibroblasts from Dupuytren’s contracture will differentiate normally in response to TGF-β. The myofibroblast is responsible for the generation of contractile force associated with contraction and characterized by the presence of α-smooth muscle actin (α-sm) and containing stress fibers. Knowledge about the effect of telomerase on human cells may lead to therapies of tissue fibroses and contractures. In this study we used telomerase to immortalize fibroblast derived from Dupuytren’s disease (DP147+hTERT) and studied their ability to differentiate into myofibroblasts. DP147 and DP147+hTERT were cultured on coverslips in the presence of TGF-β. Samples of both assays were immunostained with anti-smooth muscle alpha-actin antibody to determine the percentage of myofibroblasts. Telomerase was shown to inhibit the myofibroblast phenotype. Future goal will include comparing original to immortalized cells contractility using stress relaxed collagen lattice.

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05.03.93  The effect of freeze-dried mango on bone parameters of ovariectomized mice.

Heba Eldoumi, Brenda Smith, Edralin Lucas, Maureen Meister, Stephen Clarke,

*Oklahoma State University*

Although pharmaceutical options are available for treatment of osteoporosis, more awareness is being raised on utilizing natural products such as fruits to reduce negative side effects of the currently prescribed drugs. Fruits such as mango are rich in antioxidants, polyphenols, and phytoestrogens which can maintain skeletal health. Previous research has provided evidence of the significant effect of the mango fruit in reducing blood glucose levels and maintaining lipid profile. This study investigated the effects of freeze-dried mango on bone parameters of ovariectomized mice, a model of post-menopausal bone loss. Ninety six, 3- month old CL57/B6 ovariectomized mice were randomly assigned to one of six treatment group for ninety days: a control AIN-93 rodent diet, 1% or 10% mango, mango polyphenol extract (equivalent to the 1% or 10% mango), and alendronate group injected one a week, for 3 months. Bone density and microarchitecture parameters of tibia, and L-4 vertebrae were assessed.
05.03.94 The Kids are Doing Alright: Unexpected High Fitness Payoff of Subordinate Social Tactics in Male Collared Lizards

Joshua York, Michelle Haynie, Troy Baird,

University of Central Oklahoma

Under strong intrasexual selection, males may adopt alternative social tactics to compete for access to females. Because dominant social tactics usually involve more frequent and longer courtship, theory often predicts that dominant males sire more offspring than males displaying subordinate social tactics. However, genetic determination of parentage does not always support this prediction. We combined the social and spatial records of collared lizard females and males displaying two markedly different social tactics (territorial and non-territorial) with genetic determination of parentage to address three questions: do territorial males sire more offspring than non-territorial males, do females mate with multiple males, both territorial and non-territorial, and do multiple males inseminate individual clutches? Our findings revealed surprisingly high reproductive success in non-territorial males; average numbers of offspring sired by the two male social morphs was similar for all clutches pooled, and separately for first versus later clutches. Most (83%) females sired offspring with multiple territorial and non-territorial males. Moreover, multiple males using both social tactics fertilized most (73%) individual clutches. The homogeneous nature of the semi-natural habitat appears to promote the ability of first-year males to sneak copulations and thereby acquire higher-than-expected levels of reproductive success in this population.

05.03.95 Refined Description of a Gene Locus in Escherichia coli Encoding for Bile Salt Resistance and Sensitivity

Eden Bernstein, Anna Graves, Jim Bidlack, Jonna Whetsel,

University of Central Oklahoma

This project is a continued investigation of a chromosomal mutation that causes bile salt sensitivity in Escherichia coli. Previous attempts to narrow down the location of the mutation suggest that it affects the yciS and yciM genes. Our new focus is to conclusively demonstrate that the mutation confers bile salt sensitivity using several strains of E. coli, including the wild type and mutant strains of the bacterium as well as two genetically-engineered strains that lack the yciS and yciM genes. Primers for the yciS and yciM genes have been used to amplify DNA segments from the wild type and mutant strains of E. coli and we are now in the process of cloning and sequencing target DNA. Once cloned, genes for bile salt resistance and sensitivity will be inserted into counterpart bacterial strains to determine if resistant strains can be made sensitive to bile salts and if sensitive strains can be made resistant to bile salts. Results will provide details for a new gene locus description that includes the location, sequence, and phenotype for bile salt resistance and sensitivity in E. coli.
05.03.96 Influence of the Onset of First Egg Production on the Number of Multiple Clutches in Female Collared Lizards

Jarrod Hertzler, Troy Baird,

University of Central Oklahoma

The number of eggs produced is a strong correlate of fitness in oviparous female squamates (lizards and snakes). Within individual clutches, the number of eggs generally increases with body size, but some female squamates may also increase reproductive output by producing multiple clutches each season. Female collared lizards (Crotaphytus collaris) emerge from hibernacula when ambient temperatures and day length increase to acceptable levels, which in central Oklahoma can be as early as mid-March, and as late as the end of April. They produce multiple clutches seasonally, and number of clutches produced is positively correlated with body condition at the beginning of the season, and stored energy. Until 2012, the maximum number of clutches produced during 22 years of previous study was three. In 2012, females began emerging from hibernacula early (March 25), and the 2012 spring/summer was the warmest ever recorded in Oklahoma. For the first time, we observed the production of four clutches of eggs by 20% of females, and most females that survived the entire season produced three. These results suggest that the number of clutches produced is influenced by environmental conditions that influence the onset of first egg production. We are testing this hypothesis further by examining the number and schedule of egg production in individual collared lizard females at Arcadia Lake, over the last 23 seasons during which climatic variables have varied markedly.

05.03.97 Comparative Study of Infectious Diseases in Saudi Arabia and the United States

Eric Paul, Haitham Alnaqeb,

Southwestern Oklahoma State University

Infectious diseases are caused by viruses, bacteria, and parasites. This poster focuses on comparing some of the infectious diseases common to both Saudi Arabia and the United States such as Cholera, Salmonellosis, Malaria, and Shigellosis. We choose diseases with different modes of transmission for our study; water (Cholera), food (Salmonellosis), and blood (Malaria). Lifestyle, environment, and immigration play an important role in the spread these infectious diseases. Our research indicates that there are similarities and differences that helped spread infectious diseases in the two countries studied. The large numbers of immigrants play an important role in the spread of diseases such as Cholera in Saudi Arabia. On the other hand, the environment factors influence the incidence rates for Malaria in both Saudi Arabia and the United States. Food borne infections could be point source or common source epidemics and can be influenced by a wide array of factors. We collected data from official sources, such as, the Centers for Disease Control, the World Health Organization, and Ministry of Health of Saudi Arabia.
Analysis of the Spread and Prevalence of Antibiotic-Resistant Fecal Bacteria Among Wild Animal Populations of Bison and Longhorn Cattle in the Wichita Mountains Wildlife Refuge

Dennis Frisby, Joseph Kheir, Michael Kaiser, Tahzeeba Frisby, Cameron University

The use of antibiotics and other antimicrobials has become commonplace in modern society. Not only are they used to treat infections and disease in human clinics and veterinary medicine, but also they are routinely used as feed additives in animal and fish farms. Consequently, antibiotic-resistant bacteria are routinely isolated from farm animals. There is growing concern and mounting evidence for the spread of these resistant strains into the environment. While a number of studies have focused on the spread and persistence of antibiotic-resistant bacteria among farm animals and human populations, there is little data available about the levels of resistant bacteria in wild animal populations. Environments, such as livestock farms and human populations, with continuous selective pressure would be expected to have higher levels of antibiotic-resistant bacteria than a nature preserve or wildlife refuge where selective pressure is expected to be low. The focus of this study is to determine the prevalence of antibiotic-resistant fecal bacteria in bison and longhorn wild animal populations on the Wichita Mountains Wildlife Refuge in comparison to agricultural cattle. Suspensions of fecal samples from each animal group were plated on MacConkey agar to select for fecal coliforms which were subsequently tested for resistance to various antibiotics. Initial studies indicate surprisingly higher than expected levels of tetracycline resistance among bison.

Protein Production for Caisson Biotech’s HEPtuneTM

Neda Hessami, Oklahoma City Community College

Caisson has developed a proprietary heparosan polymer-based drug delivery system, otherwise known as Heptune. In this experiment, Component C was extracted from bacteria. This protein will be used with component A and component B to make HEPtuneTM, Caisson’s drug delivery polymer system designed to improve the performance of many drug compounds in terms of safety, tolerability, efficacy and quality. Cultures were grown in liquid media in a shake flask incubator. With careful timing, materials necessary for growth and production were added to the shake flask cultures. Cultures were grown overnight and harvested by centrifugation at 4°C the following day. The bacteria were resuspended in lysis buffer on ice. The lysates were then clarified by centrifugation. Three different steps were used to purify the protein (Component C). Protein concentration was quantitated by the Bradford Assay using a Bovine Serum Albumin (BSA) standard. The purification was monitored by SDS-PAGE Coomassie Blue staining (protein molecular weight standards, Bio-Rad). Western Blot analyses employed a rabbit antibody followed by detection with protein A-alkaline phosphatase. Yields varied between purification steps accounting for approximately 36% lost.
Development of a Histoplasma Antigen Lateral Flow Assay (Hag LFA)

Candy Palmer,

Histoplasmosis is a fungal infection caused the dimorphic fungi Histoplasma capsulatum var. capsulatum. The most virulent form is disseminated histoplasmosis and is most commonly seen in immunocompromised patients. The disease is highly treatable. However, people in resource poor environments are dying of a treatable disease for lack of an easy rapid diagnostic tool. The goal of this project was to develop a Histoplasma antigen lateral flow assay that could be used in areas with minimal laboratory infrastructure. Histoplasma specific monoclonal antibody 26-10 was grown in Integra bioreactors. The antibody was purified using fast protein liquid chromatography with an affinity resin that binds IgG. The isolated antibody was used to “capture” Histoplasma antigen shed by infected patients. Strip appearance was optimized by varying antibody concentration, membrane speeds and dilution buffers. Strict antibody purification protocols were critical to the elimination of false positives. The research developed a lateral flow product that detected Histoplasma antigen at a concentration of 12.5 ng/mL. As such, it provides a highly specific, sensitive diagnostic tool that can be used during the initial point-of-care visit.

Marker Free Genetically Modified (GM) Crops

Bobby Bezinque,

Northeastern State University

The use of selectable marker genes in genetically modified crops have been vital in their research and development. The other methods used to introduce foreign DNA in a plant cell, either by microinjection, particle gun, electroporation or agrobacterium, are relatively inefficient. Many of the markers used today are antibiotic resistant, such as hygromycin, kanamycin, and ampicillin. These antibiotic resistant genes are used during the genetic modification process, the genes are inserted into genetically modified plants as a marker, which is linked to the new gene with a desirable trait usually herbicide resistant or insecticide production. The use of these marker genes that are resistant to certain antibiotics are raising concerns among the public. The possible transfer of these antibiotic resistant genes into humans and animals has sparked many new studies into bio-safety and bio-monitoring.
Examining the Effects of Lanthionine Ketimine (LK) in Axonal Elongation in vivo

Caleb Hubbard, Andrea Holgado, Elizabeth St. John, Erica Benda, Kenneth Hensley, Taylor Baxter, Tyler Hardin,

Southwestern Oklahoma State University

Collapsin response mediator proteins (CRMPs) are cytoskeletal adaptor molecules involved in axonal elongation, alteration of cell shape, pathological disorders and neurological diseases. To further evaluate the role of CRMP2 in health and disease, we began examining the effect of CRMP2 and potential binding partners in neuronal network formation. Moreover, we reasoned that if we target CRMP2 therapeutically, we may reverse or slow-down onsets of many neurodegenerative disorders. To this end, we began a study focused on the in vivo effects of lanthionine ketimine (LK), a natural brain metabolite that binds to CRMP2. Using the nematode C. elegans, which expresses UNC-33, a homolog of mammalian CRMP2, we studied CRMP2 biology. In our work, C. elegans were grown in the presence of the cell permeable LK-ester (LKE) and synaptic connections were examined structurally. Two unc-33 mutant strains, either expressing yellow fluorescent protein (YFP) in cholinergic neurons or green fluorescent protein (GFP) in GABAergic neurons were studied. Analysis and quantification of fluorescently labeled neuronal connectivity demonstrated that LKE positively affects the neuronal networks of these strains. For instance, animals treated with LKE showed significantly less gaps at their nerve cord and a greater percentage of fully terminated commisures. These data provide evidence for in vivo function of LKE and reveal new opportunities for therapy development when CRMP2 functionality is compromised.
Comparison of Leaf Area Index (LAI) of Tomato Plants Grown Under Conventional or Plasti-culture Techniques

William Phillips, Alicia Fisher,

*Redlands Community College*

Produce producers can use plastic-culture is a management tool to conserve water and to control weeds. The objective of this research was to compare tomato plant canopy growth under conventional (C) and plastic-culture (PC) techniques. Eight rows of tomatoes (4 pairs of rows with treatment randomly assigned within each pair) were established on Canadian soils at the Darlington Applied Agriculture Research Center (Lat. 35.58 N Long. 98.00 W). Rows were 24.1 M ± SE 0.18 (78.4 ± 0.57 ft) in length. Plants were planted 1.5 m (4.5 ft.) apart. More than one variety was used, but all varieties were represented in each row. Variety was not considered as a variable in the analysis. Canopy size was estimated using a Ceptometer (AccuPar model LP-80; Decagon Devices, Pullman, WA) to measure photosynthetically active radiation (PAR) during the first week of July, 2012 when plants were mature. Four above canopy and below canopy PAR readings were made for each plant. The Ceptometer bar was held level and readings were made parallel, perpendicular, and diagonal to the row. Data were analyzed using the paired T-test procedure. Number of plants alive per row, ratio of above and below canopy PAR readings, and estimates of LAI were not different (P > 0.40) between C or PC treatments. In this experiment plasti-culture did not significant increase canopy size.

Smoke enhances germination of Phacelia strictiflora seeds

Sonya Ross, Stanley Rice,

*Southeastern Oklahoma State University*

Phacelia strictiflora is a wildflower that blooms abundantly after large fires in the cross-timbers forest of Oklahoma. It blooms only rarely at other times. We hypothesized that the seeds of P. strictiflora required exposure to smoke chemicals in order to germinate. In our experiment, the seeds germinated best in dilute smoke solution. Of several hundred seeds, only one seed germinated without exposure to smoke chemicals. When we replicated the experiment, however, a number of seeds germinated without exposure to smoke chemicals; but exposure to dilute smoke chemicals nonetheless stimulated germination relative to the controls. We therefore modified our hypothesis to state that germination of P. strictiflora seeds is enhanced by exposure to smoke chemicals.
Impact off Rootstock and Plant Spacing on Leaf Area Index (LAI) of Noiret Grape Vines During the First Year of Establishment

William Phillips, Ashton Fisher,

Redlands Community College

Grape growers can choose the rootstock (RS) and plant spacing for their vineyards. Their goal is to maximize plant canopy development, fill the fruiting zone as soon as possible and capture as much solar energy as possible to increase productivity. The objective of this research was to compare canopy development during the first year of establishment of Noiret grapes planted on three RS and spaced either 2.5 or 3.1 m apart in a split-plot design. The vineyard was established (April 10, 2012) at the Darlington Applied Agricultural Research Center (Lat. 35.58 N Long. 98.00 W) in the spring of 2012 on Canadian soils. Rows were a 50 m in length and 3.1 m apart. Noiret vines grafted on ‘Riparian’ or grown on ‘Own’ RS (three rows; Exper. 1) and vines grafted on ‘Riparian’ or ‘101’ RS (two rows; Exper. 2) were spaced 2.5 m or 3.1 m apart within the row. Spacing within row was the main plot and RS was the subplot. Ceptometer readings (AccuPar model LP-80; Decagon Devices, Pullman, WA) to measure photosynthetically active radiation (PAR) on August 8. Four above and below canopy PAR readings were made for each plant. In Exper. 1, spacing vines closer together tended (P =0.15) to decrease individual plant canopy size. In Exper. 2, vines grafted on ‘101’ RS developed greater (P < 0.09) canopy size than vines grafted onto ‘Riparian’ RS. Canopy developed during the first year of growth can be impacted by within row sp

Which Species are at Risk? Students Assess Plants Vulnerable to Being Over Harvested

Zella Classen, Lisa Castle,

Southwestern Oklahoma State University

Students taking plant science courses at regional universities scored wild harvested plants using the United Plant Savers’ At-Risk Assessment Tool. This assignment met both educational and conservation goals. Educationally, students became aware of medicinal plant uses while learning to assimilate information from many sources. From the conservation stand point, a need for a concise compilation of information regarding wild-harvested plants was identified by the United Plant Savers, a non-profit group that has created a tool to rank plants based on their vulnerability to over-harvest. Initial tests demonstrated that the assessment tool works qualitatively and mathematically, but the small number of plants scored has limited the usefulness of the tool. Student scores of plants are consistent with scores from herbalists and botanists, suggesting that the data will make a valuable contribution towards a set of rankings useful in setting conservation priorities.
Conservation Biology Research Projects with Service Learning

Patty Smith, Kelly Markwardt,

Tulsa Community College

For the past seven years, twenty-four undergraduate students developed and participated in research projects with some emphasis dedicated to community service. The implementation of undergraduate research at Tulsa Community College and the successes in conservation biology and plant conservation research courses through various service learning projects will be addressed. With the West Campus greenhouse facilities, students propagate plants for various research projects with service learning components. Students propagate native plants from local stock (seeds, cuttings, transplants) for West Campus flowerbeds designed and developed by the students. For example, the Native American Flowerbed showcases native plants used for foods, medicines, ceremonies, and other purposes by Native Americans; this was a collaborative project with the Native American Studies Program. Also, the Veterinary Technology Flowerbed showcases native plants toxic to animals; this is an ongoing, collaborative project with the Veterinary Technology Program. Currently, Kelly Markwardt is designing and developing a Butterfly Flowerbed for the Child Development Center. For future service learning projects, students will assist in the design and development of a Campus Community Garden with fruit tree orchard, vineyard of various fruits, and vegetable gardens. Each spring, the research students assist with the seed germination and propagation of crop plants for underprivileged community gardens.

Hard Times for a Weedy Vine: Cyclanthera dissecta Population Fluctuations in Drought

Lisa Castle, Ariel Seward,

Southwestern Oklahoma State University

Cyclanthera dissecta (Cucurbitaceae) is a weedy annual vine native to western Oklahoma. This species has been poorly studied, but is closely related to medicinal and edible species, including Cyclanthera pedata and agricultural weeds. We have tracked changes in a population of Cyclanthera dissecta near Weatherford, Oklahoma for over three years in order to determine baseline population size and effects of unusual weather conditions on this plant. There is not much research to look to, but we hope to learn about the effects of drought in southwestern Oklahoma. The horrid drought in this area caused a sharp decline in plant life in 2011 compared to 2010, and has made a comeback in 2012. These initial results provide a glimpse at the effects of climate change on plant populations in southwestern Oklahoma and will allow us to further investigate potential edible and medicinal compounds.
05.04.08  Invasive, not Heavenly: Students Track Ailanthus altissima Populations in Weatherford

Lisa Castle, Tanner Wheeler, Zella Classen,
Southwestern Oklahoma State University

Tree of heaven, Ailanthus altissima, has been considered both a problematic invasive and a desirable ornamental tree. Increased numbers of trees descended from intentionally planted ornamental trees may signal the start of an invasion in areas where the species has not previously been considered problematic. To test whether or not neighborhood trees were intentionally planted, students at Southwestern Oklahoma State University in Weatherford, OK counted and measured the trees or heaven and compared the distribution to that of known ornamentals. Based on the numbers of small individual trees, trees growing close together and trees growing close to human structures, we concluded that the majority of trees of heaven in Weatherford, OK were not intentionally planted. As students we hope to use the resulting baseline map to monitor population growth and track success of control measures, and to perform genetic testing to determine the source of the invasion around our campus community.

05.04.09  Mapping Invaders From Heaven: the Ailanthus altissima Population Illustrated

Lisa Castle,
Southwestern Oklahoma State University

Ailanthus altissima, also known as Tree of Heaven, is a rapidly growing non-native tree. Increased numbers of trees descended from intentionally planted ornamental trees may signal the start of an invasion in areas where the species has not previously been considered problematic. Student scientists ventured into the residential areas of Weatherford, OK in order to determine if Trees of Heaven are a problem in our community. Trees of Heaven were censused, mapped, measured and we concluded that the majority of the Trees of Heaven in Weatherford, OK were not intentionally planted. On-going data collection is involving more students in monitoring and conservation around the campus community.
The Wichita Mountains Wildlife Refuge is arguably the largest remaining tract of southern mixed grass prairie in existence. It consists of grasslands and post oak savanna, and is home to 50 species of mammals, 240 birds, 64 reptiles and amphibians and 36 fish species, as well as almost 900 plant species. However, this repository of the natural history of the Southern Great Plains is under constant threat of invasion by non-native plants. This project takes the list of 52 plants, identified by refuge biologists as the greatest potential threats, and prepares a pamphlet for distribution to the general public. This pamphlet has two pages for each species, one for images and one for text. The text page includes family, binomial and common name, as well as field characters for the family and species, natural history, and selected points of interest for each plant. The image page shows important features, such as growth architecture, leaf, flower and fruit characters for identification by non-professionals. This project reinforces the strong research, learning, and service relationship between Cameron University and the Wichita Mountains Wildlife Refuge. And provides a valuable service for the residents of southwestern Oklahoma, by identifying important invasive plants of the region. As a student research project (FJU), under the supervision of a research mentor (MTD), this project is an excellent illustration of fulfilling Cameron University’s mission of experiential learn
05.05.01 Synthesis and Characterizations of Platinum Coordinated Thiophene and Thiolate Complexes

Dr. A.K. Fazlur Rahman,
Oklahoma School of Science and Mathematics

Abstract: In our continuing effort to develop platinum based hydrodesulfurization catalysts we have synthesized a series of platinum bound thiophene and thiolate complexes. We have spectroscopically characterized complexes (I, II, III) obtained from the reaction of (C6F5)2Pt(THF)2. We have also synthesized a series of thiolate complexes by reacting DialkyPtatiumcyclooctadeine with various thiols to produce thiolato complexes via classical oxidation addition and reductive elimination mechanism. X-ray crystal structure of these complexes will be compared and a possible mechanism will also be suggested.

05.05.02 SPEME GCMS Method for the Analysis of Triclosan in Sewage Treatment Outflow Waters

John Bowen, Al Albahadily, Alex Matunas, Billy Frenier, Gregory Melsby, Kaci Rosales,
University of Central Oklahoma

Compounds including drugs, and environmentally or medically deliterous are concentrated into the sanitary sewage treatment plants and some fraction is released through the outflow waters into local streams. An analytical method for the analysis of a model drug compound Triclosan was developed and tested. The method was then used to quantitate triclosan from two treatment plant outflow waters.
05.05.03 Development of a Paper-Based Biosensor for Antibodies in Serum

John Bowen, Barry Lavine, Mary Tappert, Nicolas Shaffer,
University of Central Oklahoma

A test biosensor for antibodies in serum based on the microfluidic Paper-Based Analytical Device (µ-PAD) pioneered by the Whitesides Group (Chemistry, Harvard University) was developed to detect and identify anti-Bovine Serum Albumin (anti-BSA) using BSA immobilized onto the cellulose of filter paper. The biosensor µ-PAD used wax microfluidic channels and the familiar BCIP/NBT microspot color change reaction for the detection scheme. After the complete testing of this test biosensor, a biosensor µ-PAD will be produced to detect antibodies in sheep blood generated in response to two viral deseases Epizootic Hemorrhagic Disease Virus (EHDV) and Blue Tongue Virus (BTV).

05.05.04 Development of Hybrid Format Upper-Level Chemistry Course

Joel Smith,
Southeastern Oklahoma State University

Alternative delivery methods to the traditional face-to-face college lecture have become a fixture in higher education. A hybrid delivery format course was developed and piloted for quantitative analysis (Chemical Analysis) at Southeastern Oklahoma State University in the Fall 2012. The hybrid format consisted of 2-3 hours of video lectures and one hour of traditional face-to-face meeting weekly. Video lectures were recorded using a SmartBoard and microphone which were then converted to a format suitable to be viewed on any computer or handheld device including smartphones. Video lectures are uploaded to a server and linked to the Blackboard page. Overall student performance will be compared to previous years using traditional face-to-face format. Statistics of student access to the video lectures will be discussed. A student survey of the piloted format will be present with student suggestions for improvement.

05.05.05 Computation of Solvent Effects on Energetics of Metallocene-Catalyzed Ethylene Polymerization

Paritosh Das, Emvia Calixte,
Cameron University

Computationally, we have investigated the effects of several solvents (namely, cyclohexane, toluene and dichloromethane) on the energetics of various steps of metallocene-catalyzed ethylene polymerization. [CpCH2Cp]ZrR+, with R = CH2CH2CH3 have been primarily used as the model active catalyst species. For comparison purpose, some computational data have also been obtained on catalyst systems bearing F and CH3 substituents on the Cp ligands. All calculations were based on density functional theory (DFT/B3LYP). Compared to the gas-phase, the solvents are found to stabilize the individual cationic species (namely, reactants, products, intermediates and transition states) significantly. However, these effects largely cancel each other when applied to specific reaction steps (except for steps such as complexation or product separation for which the reactant or the product is a cation of the form [CpCH2Cp]ZrR+).
05.05.06 Dihydrodipicolinate Synthase from E. coli: Mutagenesis of Threonine 44 to Valine

Russell Evans, Lilian Chooback, Yvonne Daugherty,

University of Central Oklahoma

Dihydrodipicolinate Synthase (DHDPS), an enzyme in plants and bacteria, is a component of the L-lysine biosynthesis pathway. DHDPS catalyzes the first committed step in this pathway. The first committed step in the pathway is the reaction of pyruvate and L-aspartate-β-semialdehyde (ASA) to produce dihydrodipicolinate. L-lysine, the final product of the pathway, inhibits DHDPS. Previous literature has shown that DHDPS follows the ping-pong kinetic mechanism. In the first step in this pathway, the ε-amino group of Lysine161 places a nucleophilic attack on the carbonyl of pyruvate, producing a Schiff base. The Schiff base intermediate undergoes an irreversible dehydration step and forms an enamine intermediate. Next, ASA binds to the enzyme-enamine complex. Threonine 44 is located on the boundary of the active site of DHDPS. It is proposed that threonine 44 is involved in a proton shuttling process into and out of the active site. To determine the role of threonine 44, site-directed mutagenesis was carried out to develop the T44V mutant. To characterize the T44V mutant enzyme, kinetic studies will be performed. This work was supported by grant P20RR016478 from the National Center for Research Resources a component of the National Institutes of Health and a grant from the University of Central Oklahoma Office of Research and Grants.

05.05.07 Soil Conductivity Analysis of the Formation and Detection of Perchlorate Brines on Mars

Kayla Love, Laura Fernandez, Vincent Chevrier,

Langston University

The deliquescent property of perchlorates may play a role in controlling Martian soil and atmospheres water content on Mars. Moreover, research supports ambient air moisture contributes to the formation of liquid water on Mars’s surface. My goal was to develop a technique to enhance detectability of perchlorate brines on Mars. To achieve this, we focused on electric conductivity of perchlorate brines during the liquidus phase where both liquid water and perchlorate are stable indicating the deliquescence limit. Palaganite Soil (JSC Mars 1), which is most similar to regolith found on mars, was used with various concentrations. JSC Mars 1 samples were in closed environments surrounded with water to ensure 100% relative humidity and kept at approximately 73°C. Copper electrodes, attached to a micrometer, were inserted into samples. Samples were kept in closed environments surrounded with water to ensure one hundred percent relative humidity and kept at approximately 73°C. To observe conductivity of samples, amount of resistance was recorded over time. Results illustrated that recorded resistance and concentration of (MgClO4)2 were inversely proportional. Learning more about the behaviors of perchlorates in a Martian environment will expand research on the past conditions, current conditions, potential for biological life, and preparations for human explorations on Mars.
05.05.08 Fabrication and Characterization of a Solid State of Organic Photocatalytic for the Purpose of Improving Efficiency

Dane Scott, Cody Soden, Joshua Smith, Laura Blanco-Berdugo,

*East Central University*

Solid State Organic solar cells are of interest because they are less expensive, can be fabricated by rolling or printing processes and made of renewable materials. However, low efficiency prevents mainstream use. This work examines the possibility of using charged layers in the solid state matrix of the solar cell in order to improve electron pair separation leading to improved efficiency. The cells have been constructed using a 100 nm Al anode with a conductive polyacrylonitrile electrolyte and connecting to that a 14 ohms/square ITO slide with calcinated TiO2 which was dye sensitized with Copper Phthalocyanine. Cells were also constructed in which the conductive electrolyte layer was treated with HCl and PDDA. Both cells were illuminated using a 1.5 AM solar simulator and characterized using the Amprobe 600 Solar Analyzer.

05.05.09 Characterization of the Slow-Binding Inhibition by Acetopyruvate of the Dihydrodipicolinate Synthase from E. coli

Lilian Chooback, Priscilla Seabourn, William Karsten,

*University of Central Oklahoma*

Dihydrodipicolinate synthase (DHDPS) catalyzes the first step in the biosynthetic pathway for production of L-lysine in bacteria and plants. The kinetic mechanism is ping pong with pyruvate binding to free enzyme and L-aspartate-b-semialdehyde (ASA) binding to the F enzyme form. The enzyme is feedback inhibited by the end-product L-lysine. The enzyme has received interest as a potential drug target since it is not present in mammals. Acetopyruvate is a slow-binding inhibitor of DHDPS competitive versus pyruvate with an initial \( K_i \) of about 25 mM and a final inhibition constant of about 4 mM. The enzyme:acetopyruvate complex displays an absorbance spectrum with a \( \lambda_{max} \) at about 303 nm and a longer wavelength shoulder. The rate constant for formation of the complex is 0.03 s\(^{-1}\). The enzyme forms a covalent enamine complex with the first substrate pyruvate and can be observed spectrally with a \( \lambda_{max} \) at 275 nm. The spectra of the enzyme in the presence of pyruvate and acetopyruvate shows the initial formation of the enamine intermediate followed by the slower growing in of the E:acetopyruvate spectra with a rate constant of 0.005 s\(^{-1}\). The enzyme is proposed to form a covalent Schiff base between acetopyruvate and K161 on enzyme that subsequently deprotonates to form a resonance stabilized anion similar to the enamine intermediate formed with pyruvate.
05.05.10  Analysis of Oklahoma mushroom fruiting-body odors using GCMS and Solid Phase Microextraction

John Bowen, Alex Matunas, Clark Ovrebo, Kaci Rosales,

University of Central Oklahoma

Various mushrooms including varieties of stinkhorns use a reproductive strategy involving disagreeable odors to disseminate their spores by drawing flies. In this study, an analytical method using Gas Chromatography Mass Spectrometry and Solid Phase Microextraction was developed to analyze the odor causing compounds of Lysurus mokusia and other wild mushrooms. Results from four species of stinkhorn mushrooms will be presented and the compounds identified in each species will be compared.

05.05.12 Indigo Blue: Connecting its Chemistry with History

Dene Betz, Caleb Wood, Dr. A.K. Fazlur Rahman, Ethan Wood,

Oklahoma School of Science and Mathematics

This presentation illustrates the intriguing connection of the chemistry of Indigo blue and its history in the context of chemical synthesis and agricultural production centuries ago in British India. Indigo blue was cultivated in India for almost two hundred years. It started about 1780 and continued until World War I. Von Baeyer, a German Chemist synthetically produced Indigo blue in 1890, and it was not heavily commercialized until 1913. The agricultural production of Indigo in India has its own story. From the confiscation of agricultural land to an extensive labor oriented extraction process, indigo production took a human toll. The natural extraction process, the laboratory synthesis and its usage in the past and present are described in this presentation.

05.05.13  GC/MS Comparison Analysis of Wormwood Related Plants Serving as a Natural Way of Deworming Farm Animals Versus Current Deworming Products.

Megan Meek, Tiffany Maher,

Northeastern State University

The increased utilization of natural resources is a growing trend among farm owners. The term “going green” doesn’t only help the environment, but it also helps many farmers substantially when it comes to controlling costs. Wormwood is an herb commonly used for farm animals to treat worm infections. Common ragweed, giant ragweed and sericea lespedeza are all relatives to wormwood that grow naturally in Oklahoma. The primary objective is to be able to use these natural growing plants as a dewormer for farm animals in place of deworming products currently on the market. The composition of hexane and ether extracts from branches, leaves and blooms of each were investigated. Samples were analyzed using GC/MS and compared against ivermectin, fenbendazole and moxidectin.
05.05.14 Transition Metal Binding by Desferrioxamine

Brianna Broad,

Northeastern State University

Desferrioxamine (DFO) is one of the most well-characterized microbial siderophores. In this study a series of metal ions were evaluated for binding by DFO. Solutions of DFO were titrated with Fe(III), V(II), Co(II), Ru(III), Ga(III), or Mn(II) in a buffered solution at room temperature. Metal ion binding was monitored using a UV-VIS spectrophotometer, scanning from 700 to 200 nm, after incubating the solutions of siderophore and metal for at least 20 minutes. Iron, Vanadium, Cobalt and Ruthenium were bound by DFO under the experimental conditions. Gallium and Manganese were not bound by DFO under these conditions. The next set of experiments will evaluate the strength of binding through competition and by determination of formal binding constants.

05.05.15 Identifying Ada City Water Leaks by Measuring Ca, Mg, and Total Hardness

Destiney Shouse,

East Central University

The source of the Ada, OK water supply is Byrd's Mill Spring which comes from the Arbuckle Simpson aquifer. The calcium to magnesium to hardness ratios in this aquifer have been shown to be consistent over time (1) and can serve in distinguishing water pipeline leaks from natural seeps throughout the city. Water samples were collected and analyzed for calcium and hardness to determine their source. The initial plan called for sampling in the Ada metropolitan area to distinguish natural seeps from Ada city water with the use of two USEPA titrimetric methods. This plan was modified due to difficulty with the calcium procedure and the summer drought. The results clearly showed the distinction between Ada city water and samples from other sources.

05.05.16 The Synthesis and Reactivity of a NNC Nickel Chloride Complex

Steven Meier, Amanda Purcell, Jessica Laverty, Kelsey Coy,

University of Central Oklahoma

The NNC ligand (NNC = 6-phenyl-2,2'-bipyridine) has been cyclometallated to palladium, platinum, iridium, and rhodium to generate a variety of complexes that are capable of cleaving the C-H bond. Edwin Constable who originally synthesized the NNC ligand was able to attach the ligand to platinum and palladium, but no results were reported on using nickel. The NNC ligand is normally attached to transition metals through insertion of the metal into the aryl C-H bond. However, this route was not successful for the attaching the NNC ligand to nickel. It is widely known group 10 metals insert into aryl halide bonds, and this was exploited in the synthesis of the NNC nickel complex. The NNC halide derivative 6-(2-chlorophenyl)-2,2'-bipyridine was synthesized and attached to nickel through insertion using bis(cyclooctadiene)nickel(0). The resulting (NNC)NiCl complex is sparingly soluble in chloroform, therefore, an alternative ligand 6-(2-chlorophenyl)-4-(p-anisole)-2,2'-bipyridine was synthesized and attached to nickel. Work has been ongoing to replace the chloride ligand with various other ligands such as phenyl, ethoxide, and trifluoracetate in order to generate a more reactive complex.
The Synthesis of a Ruthenium NNC Pincer Complex

Steven Meier, Luis Figueroa,
University of Central Oklahoma

The NNC ligand (NNC = 6-phenyl-2,2'-bipyridine) has been cyclometallated to palladium, platinum, iridium, and rhodium to generate a variety of complexes that are capable of cleaving the C-H bond. Edwin Constable who originally synthesized the NNC ligand was able to attach the ligand to a ruthenium terpyridine complex, but that complex was not able to be used as a C-H activation catalyst. The goal of this research has been to try to develop other ways to attach NNC derivatives to ruthenium in order to produce a C-H activation and functionalization catalyst. The NNC ligand is normally attached to transition metals through insertion of the metal into the aryl C-H bond. However, this route has not been successful for the synthesis of the ruthenium NNC complex. Therefore, alternative routes had to be developed. Others have shown that the easily synthesized (Ph3P)3RuCO(H)2 complex, after reduction to ruthenium(0), inserts into aryl bromide and aryl iodide bonds. Several other NNC halide derivatives have been synthesized, and work has been ongoing to insert ruthenium into the aryl halide bond in order to attach the NNC ligand to ruthenium. Future work will be focused on modifying the (NNC)ruthenium complex into an active C-H activation catalyst.

Dynamic Coupling of Rotors and Axles in Rotaxanes

James Dechter, Kim Pham, William Garbe,
University of Central Oklahoma

Supramolecular structures are held together by intermolecular forces rather than chemical bonds. They are of interest for purposes ranging from the construction of the various components of molecular machines in nanotechnology, to the study of the self-assembly of molecules. Our interest in nuclear magnetic resonance (NMR) studies of the dynamic coupling of supramolecular structures has led us to investigate “rotaxanes”, which derive their name from their description as a rotor molecule threaded onto an axle molecule. Our interest is to probe the effect of the diameter of the rotor molecule on the dynamic behavior of the axle molecule – an effect called dynamic coupling. We have chosen a series of cyclic polymers as the rotors which have the common name cucurbiturils. The series with 5-8 monomer units are commercially available, and the specific polymer is designated by the n in cucurbit[n]uril. The axle we have chosen is spermine tetrahydrochloride (SPM•4HCl). Evidence will be given for the formation of rotaxanes between the axle SPM•4HCl and the two rotors, cucurbit[6]uril and cucurbit[7]uril. Preliminary results for the dynamic coupling experiments for these systems will be presented. Also, we will present evidence confirming the formation of a charge-transfer complex in the interior of the cucurbit[8]uril rotor when methylviologen and hydroquinone are used together as rotors.
05.05.19  Reversed Phase HPLC Analysis of B-Vitamins

Stormie Holcomb, Jessica Martin,

Northeastern State University

B-vitamins are a very important part of the human system. B-vitamins are found in most multivitamin tablets. A lack of certain B-vitamins can cause diseases, such as a deficiency of folic acid can cause anemia. For our research, we followed a simple HPLC reversed phase system that provides analysis of certain B-vitamins using an Ascentis Express C18 column from Sigma Aldrich. The purpose of this experiment was to develop a method for analysis of folic acid, pyridoxine, and thiamine hydrochloride using HPLC to ultimately test multivitamin tablets and verify the amount of the B vitamin contained in the product or test the degradation of the vitamin over time. A reversed phase HPLC method was developed and a standard curve was created for each B-vitamin. The method developed can be used in the future to analyze the content of these B-vitamins in various supplements.

05.05.20  Synthesis and Evaluation of a New Generation of Highly Acidic Nucleophilic Glycine Equivalents for the Preparation of Unnatural a-amino acids

Trevor Ellis,

Southwestern Oklahoma State University

A series of highly acidic nucleophilic glycine equivalents, valuable for the preparation of unnatural a-amino acids via homologation approaches, have been developed. These novel nucleophilic glycine equivalents are founded on the modular design of Ni(II) glycine Schiff Bases. The increased acidity of the a-protons of the glycine moiety arises from the strategic introduction of trifluoromethyl group(s) into the benzophenone module of the nucleophilic glycine complexes. The syntheses of the various trifluoromethyl containing glycine equivalents, as well as the previously unreported synthesis of the necessary trifluoromethylated amino-benzophenones, are described. The reactivity of this series of glycine equivalents has been investigated by the evaluation of competitive reactions between the Ni(II) complexed glycine equivalents containing a 2-aminobenzophenone, a 2-amino-4’-(trifluoromethyl)-benzophenone, or a 2-amino-3’,5’-bis(trifluoromethyl)-benzophenone moiety under kinetic or thermodynamic reaction conditions.
05.05.21 Nutritional Benefits of Different Tomato Strains: A Look at Glucose, Fructose and Vitamin C.

Tyler Vann, Lilian Chooback,

University of Central Oklahoma

Depending on the strain and freshness, the nutritional content of tomato may vary. Using anthrone reagent the total concentration of carbohydrates in the tomato can be measured. The anthrone dehydrates monosaccharides to form furfural derivatives. The formation of the furfural derivatives were evident by appearance of brown color and the intensity of the color was proportional to the concentration of fructose. To distinguish between glucose and fructose the sample was exposed to resorcinol, which reacts much quicker with ketoses as compared to aldoses. Using spectroscopy and monosaccharide standard the glucose and fructose content of different tomato sample were found. It was discovered that the Grape and Romano strains had a higher concentration of fructose when compared to the Cluster and Campari strains. We are in the process of measuring the ascorbic acid contents of the same tomato samples using test strips.

05.05.22 Dihydrodipicolinate Synthase From E. coli: Site-Directed Mutagenesis of Arginine 138 and Lysine 133

Tyler Vann, Charles Nguyen, Lilian Chooback, William Karsten,

University of Central Oklahoma

Dihydrodipicolinate synthase catalyzes the formation of dihydropicolinate from pyruvate and L-aspartate-R-semialdehyde(ASA). The enzyme catalyzes the first committed step for the biosynthesis of L-lysine in bacteria and plants. The enzyme from Escherichia coli is feedback inhibited by lysine, the end product of the pathway. A study of the pH dependence of the kinetic parameters was done to elucidate the acid-base chemical mechanism of the enzyme. The Σ-amino group of lysine 161 attacks the carbonyl of pyruvate and forms a Schiff base intermediate. The loss of a proton from this intermediate leads to the formation of an enamine intermediate. The second substrate, ASA binds to the enzyme:enamine covalent intermediate. Site-directed mutagenesis was done to investigate the role of the active site arginine 138 (R138), and lysine 133 (Y133). The R138A, R138K, and Y133F mutants were created and the identity of the mutants was confirmed by DNA sequencing. Kinetic studies will be done to characterize the mutant enzymes. This work was supported by grant P20RR016478 from the National Center for Research Resources a component of the National Institutes of Health and a grant from the University Central Oklahoma.

05.05.23 Biomass Deconstruction to Produce Sugars Using Ionic Liquid

Jude Abia, Rashad Ismayilov,

Northeastern State University

The ability to use cellulosic biomass for the large scale production of fuels and chemicals depends critically on the development of effective conversion processes. The major technological barrier to using cellulosic biomass has been the depolymerization step in which sugars are produced for conversion into molecules with higher energy densities than the parent biomass. The high energy cost and difficulty in processing biomass are the main roadblocks to the widespread commercialization of this renewable energy source. We report on the development of technologies involving ionic liquids that can i) efficiently deconstruct cellulosic biomass to release cellulose and hemicellulose, ii) hydrolyze cellulosic components to produce sugars.
05.05.24 Conversion of Vegetable Oil to Biodiesel Using Microwave Irradiation

Tyler Scott, Spence Pilcher, Northeastern State University

With the ongoing rise in cost of crude oil and focus on global warming, finding renewable energy sources is a current area of trending research. Biodiesel is an alternative energy source that has sparked interest in our region due to its ability to reduce toxic emissions, reduce dependence on foreign oil, and contribute to rural economic development. To introduce undergraduate research students to this topic, an experiment was developed for the organic chemistry II laboratory course which entailed preparing biodiesel from vegetable oil using microwave irradiation. The procedure that afforded the highest conversion of vegetable oil to biodiesel used potassium hydroxide as the catalyst (1.0wt%.in methanol) and reacted at 50oC for 5 minutes.

05.05.25 Genetic Variation in PPARγ at Nucleotide 1431 Impairs Obesity Related Phenotypes in Response to Exercise Training

Martell Mckinney, Langston University

Obesity is now the second leading cause of death in the United States, and is likely to become the first. Exercise can significantly reduce body mass and decrease BMI, a measurement used to determine obesity. However, not all overweight patients respond suitably to exercise. Research supports a “possible” candidate gene that may affect responses to exercise training in obese patients: Peroxisome Proliferator–Activated Receptor Gamma (PPARγ). PPARγ activates certain genes in a fat cell, resulting in the storage or burning of fat. Changes in PPARγ gene polymorphism may have potential functional effects. Thus, we chose to determine whether the C1431T polymorphism influences the response to aerobic exercise training. Polymerase chain reaction (PCR) was used to amplify only DNA segments with PPARγ. PCR products were subjected to restriction digestion by HpyCH41V which cleaved at 5’-ACGT-3’ which included nucleotide 1431 and allowed us to recognize PPARγ nucleotide specific genotypes and polymorphisms via a DNA gel. Results demonstrated significantly lower post- exercise BMI scores for carriers of thymine at PPARγ nucleotide 1431 in response to exercise training when compared to carriers of cytosine PPARγ nucleotide 1431. Our data contributes to supporting PPARγ is a promising candidate gene for therapeutic treatment against obesity.
05.05.26 Cellulosic Ethanol for Biomass Fuel

Justin Watts,
Northeastern State University

There are many scientists in numerous countries, including the United States, working on solving the world's energy crisis. Research is being conducted on different technologies including solar power, wind power, and biofuels. The subject of my research is a specific type of biofuel called cellulosic ethanol. Ethanol itself is a highly combustible fuel, it even has a higher octane rating than premium gasoline. However, this also means that most engines need a blend of ethanol and gasoline to function without potential harm unless it is an E85 approved vehicle. Given the potential decrease in fossil fuel consumption and separation from dependence on foreign oil I believe harnessing the potential energy from the cellulose found in plants and fungi could be the greatest development of this century. The problem lies with the inefficient methods and high cost associated with ethanol, along with the biomass feedstock issues. In this experiment we will show how cellulose can be broken down into glucose by the enzyme cellulase, and fermented to produce carbon dioxide and ethanol. Cellulase is actually a group of enzymes that hydrolyze the glycosidic linkage between the glucose monomers. Since there are many different enzymes and many different linkages, finding the right enzyme and feedstock may prove crucial to this research.

05.05.27 Structure Activity Relationship Studies to Improve Cancer Drugs

Dana Rundle, Caitlin Kriewall, Kelsie Magiera, William Carroway,
University of Central Oklahoma

The objective of this study was to evaluate twenty-six E series compounds prepared by Dr. K. Darrell Berlin of Oklahoma State University for further research as cytotoxic agents toward ovarian cancer cells. The E series compounds are structural optimizations to increase solubility while preserving the cytotoxicity of the heteroarotinoid, SHetA2. The E series compounds and SHetA2 are called flexible heteroarotinoids (FlexHets) due to structural flexibility gained by adding a flexible urea or thiourea linker region. SHetA2 has a known 10 μM LC50 in ovarian cancer cell lines, but has no comparable effect on normal cells in culture. E series FlexHet cytotoxicity was compared to that of SHetA2 utilizing a cell proliferation assay in cell culture models using A2780 and SK-OV-3 human ovarian cancer cells. Five E series compounds showed cytotoxicity comparable to that of SHetA2. An evaluation of structural features in E series compounds that promote cytotoxicity versus those features that do not may lead to the development of improved heteroarotinoids for possible therapeutic intervention. Currently the synthesis of E1 is underway to generate an amount sufficient for further analysis of its intracellular effects, and other potent E series compounds will be synthesized. Further studies of E series compounds will be done by kinase assay, kinase inhibition, and Western blotting to examine which signaling pathways and proteins these heteroarotinoids act upon to induce cell dea
05.05.28 **Effects of microwave irradiation on the free-radically initiated microemulsion polymerization of styrene**

Brent Roberts, Spence Pilcher,

*Northeastern State University*

Microwave irradiation has been used to enhance various organic reactions, improving reaction times and yields. In this study, the effects of microwave irradiation, as compared to conventional heating, on the radically-initiated microemulsion polymerization of styrene were investigated using varying initiators, initiator weight percent, and surfactant. The free radical initiators potassium persulfate (KPS) and 2,2'-azobis(2-methylpropionamidine) dihydrochloride (V-50) were used at weight percents of 0.1 and 1.0% with either stearyl trimethylammonium chloride (STAC) or cetyl trimethylammonium bromide (CTAB) as the surfactant. Polymerizations using conventional heating generally had slightly higher percent conversions over those identical procedures using microwave irradiation. However, the reaction that consistently had the highest percent conversion was initiated by 1.0 wt.% V-50 with CTAB using microwave irradiation. Polymerizations using V-50 consistently produced the most polymer at 1.0 wt.% when compared to KPS. The majority of trials initiated by 0.1 wt.% of initiator failed to produce polymer. The two surfactants yielded similar percent conversions with other parameters being the same. The molecular weight of the formed polystyrene was approximately 2x10^6 g/mol regardless of reaction parameters, and polydispersity indices were 2.0-2.5. Both microwave and conventional heating produced polymer samples having glass transition temperatures of approximately 100°C.

05.05.29 **N-Substituted Polycyclic Aromatic Hydrocarbons as Models for Organic Switches**

Dwight Myers, Daniel McInnes,

*East Central University*

N-substituted polycyclic aromatic hydrocarbons are proposed for use as organic solid state transistors or switches[1]. Simple molecules of this sort include phenazine and dibenzo[b,j]phenazine. Using these molecules as simple model compounds, we have begun an ab initio computational study of these compounds and the effect of electron withdrawing or donating groups in place of hydrogens on the aromatic rings. Calculations have been made for phenazine and dibenzo[b,j]phenazine and their corresponding polycyclic aromatic hydrocarbons anthracene and phenazine. Work in progress and future directions will be discussed. 1. Wu, Y., Yin, Z., Xiao, J., Liu, Y., Wei, F., Tan K. J., Kloc, C., Huang, L., Yan, Q., Hu, F., Zhang, H., and Zhang, Q., “Crystal Structure and Phototransistor Behavior of N-substituted Heptacenes, Appl. Mater. Interfaces 2012, 4, 1883-1886.
05.05.30 Microwave Synthesis of Ti- and Y-Doped BIMEVOX Compounds

Dwight Myers, Chandra Thapaliya,

East Central University

Oxide ion conductors such as the BIMEVOX series of bismuth vanadium oxides are proposed as solid electrolytes for Solid Oxide Fuel Cells (SOFC)[1]. These are synthesized by substituting small amounts of a different metallic ion for vanadium in Bi4V2O11 to give Bi4V1-xMexO11-3x/2. Microwave assisted synthesis of BIMEVOX phases can greatly speed reaction times[2]. We have prepared the titanium and yttrium doped BIMEVOX phases with x = 0.1-0.3. X-ray diffraction patterns indicate the formation of high purity products. The effects of degree of compaction and different crucible materials have been examined. 1. F. Abraham, J.C. Boivin, G. Mairesse, and G. Nowogrocki, Solid State Ionics 40/41 (1990) 934-937 2. Vaidhyananthan, K. Balaji, and K. J. Rao, Chem. Mater. 1998, 10, 3400-3404

05.05.31 A Study of Varied Dopant Levels in BIMEVOX Compounds by Microwave Synthesis

Dwight Myers, Joshua Smith,

East Central University

Oxide ion conductors such as the BIMEVOX series compounds have applications in electrolyte membranes for Solid Oxide Fuel Cells (SOFC) [1]. BIMEVOX compounds were synthesized by substituting a different metal ion for vanadium in Bi4V2O11 to give Bi4V1-xMe11-3x/2. This study focused on manganese, silver, and gallium doped BIMEVOX phases with x=0.1-0.4. The microwave assisted synthesis method of BIMEVOX has proven to greatly decrease reaction times [2]. X-ray diffraction patterns indicate that the products are of high purity. FTIR analysis has also been performed to characterize the compounds. Compaction of materials and different crucible materials have also been examined. 1. F. Abraham, J. C. Boivin, G. Mairesse, and G. Nowogrocki, Solid State Ionics 40/41 (1990) 934-937 2. Vaidhyananthan, K. Balaji, and K. J. Rao, Chem. Mater. 1998, 10, 3400-3404

05.05.32 The Prospects of Biofuel in Oklahoma: An Educational Study

Nathan Jia, Dr. A.K. Fazlur Rahman, Jimmy Wu,

Oklahoma School of Science and Mathematics

Oklahoma’s economy is primarily based on agriculture and has also been dependent on oil and natural gas for almost fifty years. The demand for clean and renewable energy alternatives to fossil fuels such as organically produced ethanol is rapidly increasing in both the United States and the world at large. Oklahoma has the resources to become a powerful contributor to meeting this demand, a competitor in the biofuel market not only nationally, but also globally. The integration of biofuel technology into a petroleum based energy sector will bolster Oklahoma’s agricultural economy and increase our preparedness for future energy crises. Also noteworthy is the participation of universities and industries in biofuel research, which will bring breakthroughs in the development of new crop systems as well as a new sector devoted to increasing agricultural production. These developments have the potential to greatly benefit Oklahoma’s economy by creating many new job opportunities in both urban and rural Oklahoma. The aim of this study is to increase our understanding of biofuel research initiatives in Oklahoma.
05.05.34 Measuring Temperature Dependence on Charge Organization in Ionic Liquids

Gage Coltrain, Christopher Burba,

Northeastern State University

Room temperature ionic liquids exhibit substantial amounts of charge organization in the liquid phase. Charge organization plays a significant role in defining the properties of ionic liquids and there are several coordinated solvation shells localized around cations. A central goal of research in this field is characterizing the degree of charge organization in an ionic liquid and correlating those values to properties of the materials that make them attractive as solvents. We propose a cost-effective method for investigating charge organization in a family of 1-alkyl-3-methylimidazolium trifluoromethanesulfonate ionic liquids using simple FT-IR spectroscopic techniques. Charge organization of the ionic liquids is measured as a function of temperature with the proposed method. Increased temperatures should increase the thermal motion of the ions composing an ionic liquid, disrupting any long-range charge organization. Furthermore, longer alkyl side chains attached to the imidazolium ring are expected to frustrate charge organization and further decrease the level of observed charge organization. FT-IR spectroscopic measurements confirm both of these hypotheses.

05.05.35 The Effects of Microwave Irradiation on the Microemulsion Polymerization of Methyl Methacrylate

Dustin Baucom, Spence Pilcher,

Northeastern State University

Microwave irradiation has several advantages as a heating method for chemical reactions including shorter reaction times, less energy required, and uniform heating. The project focused on the specific effects that microwave irradiation had on different parameters in the polymerization of methyl methacrylate (MMA) in microemulsions which were formed using stearyl trimethylammonium chloride (STAC) or cetyl trimethylammonium bromide (CTAB) as the surfactant. Initiator, initiator concentration, and reaction time were varied and the percent conversion and properties of the resultant polymer were compared to their conventional heating analogs. Polymerizations using microwave irradiation had a higher conversion rate than conventional heating at the 5 minute reaction time and at lower initiator concentration (0.1 wt.% monomer). For longer reaction times and standard initiator concentrations (1.0 wt.%) the percent conversions from the two heating methods were similar. Reactions using 2,2'-azobis(2-methylpropionamidine) dihydrochloride (V-50) achieved approximately 10% higher conversion rate on average than those employing potassium persulfate (KPS) as the initiator regardless of heating method. V-50 consistently produced polymer at a low concentration (0.1 wt% monomer) in the microwave. Latex particles sizes were 17-31 nm, molecular weights were 9.9x10^5-2.8x10^6 g/mol, and polydispersities were 1.6-2.2 and were independent of all parameters other than concentration.
05.05.36 Developing Laboratory Experiments for General and Organic Chemistry Labs Using the Vernier LabQuest

Azeezatulai Oyebola, Elizabeth Nalley, Seth Geiger, Stewart Younger-Mertz,

*Cameron University*

Nalley, Department of Physical Sciences, Cameron University, Lawton, OK 73505 Recently the Cameron University of Physical Sciences purchase Vernier Lab Quest Data Collecting Devices and associated instrumentation and sensors in order to facilitate data collection in our chemistry and physics laboratories. LabQuest is a standalone and computer interface for Vernier sensors or other data collecting devices. It uses its color touch screen to collect, graph, and analyze data in the classroom or in the field. In this project we were interested in developing experiments using the Vernier Polarimeter which could be adapted to general, organic or biochemistry laboratories. The polarimeter can be used to measure chiral properties of optically active samples without chemically modifying or destroying the sample. This poster will describe three experiments which were developed for our laboratories using the Vernier Polarimeter.

05.05.37 Determining the Cause of Temporal Instability of Self-Assembled Gold Nanoparticle Thin Films

Kristen Worthen, Nolan Flynn,

*Cameron University*

Gold nanoparticle thin films have many functions in biosensing and microelectronics. The gold nanoparticle thin films are formed by self-assembly on silicon dioxide glass microscope slides through a layer-by-layer immersion technique. Gold nanoparticles (AuNPs) are employed to make these films because AuNPs have previously been shown be biocompatible, relatively inert, and form monolayers rather easily. However, the temporal degradation of the thin films in an aqueous medium prevents their widespread use in biological applications. The degradation of the thin films is quantified by measuring the contact angle. Previously, it had been assumed that the decrease in contact angle, and thus the degradation, was due to desorption of the AuNPs from the film. However, analysis by ICP-OES after a moderate time period did not indicate loss of AuNPs from the films, and instead indicated a desorption of the outer layer of dodecanethiol from the slides.
05.05.38 Progress Towards the Synthesis of 1Alpha-Hydroxyvitamin D5 Core System

Dragos Albinescu, Jake Barber,

Northeastern State University

This research project presentation describes the six-step synthesis of the core fragment of 1α-hydroxyvitamin D5, a new, highly potent cancer chemopreventive agent, that was able to reduce the tumor incidence up to 47% and tumor multiplicity up to 50% in chemically-induced mammary carcinogenesis experiments in rats. This six-step synthesis project is part of a larger synthetic project aiming to develop an improved, convergent synthesis of the cancer chemopreventive agent 1α-hydroxyvitamin D5, as a better alternative to the current 18-step linear synthetic approach. The starting material for this synthesis was vitamin D2 that was first converted into a sulfur dioxide adduct. The free hydroxyl group of the sulfur dioxide adduct was protected as a triethylsilyl ether, followed by selective cleavage of the vitamin D2 side chain via ozonolysis and reduction of the generated aldehyde to the corresponding alcohol, that represents the forth intermediate in the synthesis of 1α-hydroxyvitamin D5 core system. The alcohol will be further converted into a tosylate and the sulfur dioxide will be extruded from the adduct to yield the "trans"-vitamin D triene system, that constitutes the target molecule of this research project.

05.05.39 Regiospecific Luthium Mediated Sn2 Benzylation of a Natural Anthoquinonoid Dye

Rajah Singh,

Langston University

Research shows that disperse dyes containing additional –OR groups (R = methyl, alkyl or phenyl) have better sorption onto certain fabrics. Thus by tailoring the functionality of the hydroxyl groups it may be possible to synthesize natural dye derivatives with good compatibility to these fabrics. As the sorption of hydrophobic dyes onto biodegradable synthetic fabrics can be improved by substituting non-polar groups onto more polar functionalities, it is possible to develop simple and specific reactions to synthesize natural dye derivatives to replace artificial dyes. In this study we aimed to achieve efficient production of a mono di-ether Purpurin product. We produced a regiospecific reaction mixture with lithium acetate. The product from this reaction was extracted, dried, and concentrated in vacuo. The product was recrystallized in ethylacetate to afford a dark red solid and compared to the general reaction. TLC and 1H NMR spectroscopy confirmed an ether linkage solely on the 2-position, creating a mono-product with a decreased polarity. Results support that our technique efficiently produces the preferred mono di-ether Purpurin product.
05.05.41 The Production of Xanthan Gum as a Sustainable Source of Hydraulic Fracturing

Lindsay Davis,

Langston University

For many years, scientists have been searching for more sustainable ways to support life on Earth. The fossil fuels that have been used for millions of years are depleting, leaving researchers to find quick solutions. Hydraulic Fracturing is a fairly new process that extracts natural resources from the shale layer of the Earth. How exactly do we get the resources without damaging and contaminating the environment? To date, Guar Gum and Kerosene are being used to produce fracking fluid that makes the process run smoothly. However, these two products are non-biodegradable and expensive. This project investigates how to efficiently produce a less expensive, biodegradable Xanthan Gum product. Xanthan Gum is derived from Xanthomonas campestris found in plants. X. campestris was planted on 3 different types of media to analyze the best method for growth; a solid, liquid, and intermediate media. Results demonstrated only immobilization of X. campestris allowed growth and enabled us to produce Xanthan Gum. Using our efficient technique to produce Xanthan Gum will be beneficial for two reasons. First, growing Xanthan Gum from Immobilized Bacteria would secure the food supply and reduce its cost; presently most of the fracking gum is taken from the food supply, adding to elevated food prices. Second, this technique may reduce America’s gas prices and dependency on foreign oil by making fracking more sustainable via using less expensive techniques and using biodegradable material.

05.05.42 Electrochemical redox mechanism analysis of Li2-xFeP2O7 (0≤x≤1) pyrophosphate cathode via IR spectroscopy

Chad Hollifield, Christopher Burba,

Northeastern State University

Effective materials for assembling electrochemical cells are an important and rapidly advancing focus in the industrial and scientific world. Li2FeP2O7 has been structurally and electrochemically reported and confirmed, however more study on the redox mechanism is needed to advance the understanding of cathode performance. We are interested in the analysis of Li2FeP2O7 via infrared spectroscopy to deduce and contribute to plausible redox mechanisms. Electrochemical extraction of lithium ions from the cathode material affects the electron distribution within the P-O bonds, and thereby affects the vibrational frequencies and IR band intensities. Thus, IR spectroscopy provides insight into the delithiation process from the perspective of the P2O7 anions. Before the analysis could be carried out, the cathode material had to be synthesized through a solid-state procedure and precursor mixture modeled by previous work. Once the material was synthesized, powder x-ray diffraction was performed to verify the desired product was prepared. The chemical delithiation of Li2FeP2O7 was attempted with nitronium tetrafluoroborate in acetonitrile to produce cathode material that is free from conductive carbon and binder materials typically present in a battery cathode. Experimental data is presented demonstrating that the desired material has been obtained and the chemical oxidation may be an effective means to extract lithium ions from the compound to prepare a series of LixFeP2O7.
Abstracts from the 2013 Oklahoma Research Day
Held at the University of Central Oklahoma

05. Mathematics and Science

06. Computer Science

05.06.01 A Comparison of Artificial Neural Network Libraries
Patrick Harrington,
Northeastern State University

Artificial neural networks were designed to model the unique architecture of the human brain, and are used to solve complex problems that are otherwise hard to solve using traditional algorithmic techniques. Neural networks are used in character recognition, speech recognition, and can be applied to NP-complete problems including the traveling salesman problem. There are several computer programming libraries, complete with code, available that allow for implementation of neural networks. Our research uses the concept of neural networks to compare three of these artificial neural network libraries: FANN, Snipe, and Encog. Our comparison is based upon the areas of the features, extensibility, documentation, and efficiency of the libraries. Our findings indicate that the Encog library is the most robust and the overall best choice.

05.06.02 Android TextEncrypt
Rad Alrifai, Clinton Parker,
Northeastern State University

With a drastic increase in high profile hacking attacks in the last few years, the general public has become increasingly aware of computer security issues. Cell phones, despite being mobile computers now, are generally not considered unsafe by the average person as long as they maintain possession of it. Unfortunately, the most common encryption standards used by cell phone transmissions currently, A5/1 and A5/3 (known as KASUMI) have been shown to be weak and vulnerable to attack with very modest computational resources. Additionally, due to the nature of the SMS service architecture, text messages that are sent are stored in multiple locations other than the sender and receiver. TextEncrypt attempts to mitigate these weaknesses by encrypting a text message with AES 128bit encryption before ever broadcasting the message, thereby adding an additional layer of significant protection behind the obfuscating layer of the current lacking standards. Should an attacker either decrypt the radio signal or gain access to an SMS server, they will still need to decrypt the individual messages. This is currently a nontrivial task.
05.06.03  Sharing and Social Networking through Mobile Devices Based on Cloud Computing

Zhibin Zhang, Jicheng Fu,

University of Central Oklahoma

This research cooperates with Cloud Computing. It will investigate a new way to allow users to share information through mobile devices and to find other users within a certain physical range. The purpose of this research is to invent a tool that allows people to share data and to socialize with each other more easily and effectively. Right now there is a running prototype web application online at Google App Engine.

05.06.04  Towards an Intelligent System for Clinical Guidance on Wheelchair Tilt and Recline Usage

Jicheng Fu, Paul Wiechmann,

University of Central Oklahoma

We propose to construct an intelligent system for clinical guidance on how to effectively use power wheelchair tilt and recline functions. The motivations fall into the following two aspects. (1) People with spinal cord injury (SCI) are vulnerable to pressure ulcers. (2) Clinically, wheelchair power seat function, i.e., tilt and recline, is recommended for relieving sitting-induced pressures. The goal is to increase skin blood flow for the ischemic soft tissues to avoid irreversible damage. Due to variations in the level and completeness of SCI, the effectiveness of using wheelchair tilt and recline to reduce pressure ulcer risks has considerable room for improvement. In this study, we propose to use the artificial neural network (ANN) to predict how wheelchair power seat functions affect blood flow response to seating pressure. This is regression learning because the predicted outputs are numerical values. Besides the challenging nature of regression learning, ANN may suffer from the overfitting problem which, when occurring, leads to poor predictive quality (i.e., cannot generalize). We propose using the particle swarm optimization (PSO) algorithm to train ANN to mitigate the impact of overfitting so that ANN can make correct predictions on both existing and new data. Experimental results show that the proposed approach is promising to improve ANN’s predictive quality for new data.
05.06.05  Vigenere Cipher Tool

Rad Alrifai, Adam James,

Northeastern State University

There are several ways of encrypting messages and the vigenere cipher is one of them. Whether users are trying to hide their data or expose the data of others, Vigenere Cipher Tool can help. This software is intended to enable users to encrypt and decrypt data using the vigenere cipher. It also allows the user to test the strength of their key and decrypt encrypted text without the use of a key. The Vigenere Cipher Tool was created in order to write and break secure messages and to learn about the strengths and weaknesses of the vigenere cipher. In order to break the cipher, the Vigenere Cipher Tool utilizes common vigenere code breaking tactics. The first step in breaking the cipher is to find sequences in the encrypted text that repeat themselves and record the distances between occurrences. The factors of these occurrences will determine the key size used in the encryption process. Once the key size is determined, the text is analyzed using letter statistics to find the key itself. Vigenere Cipher Tool is run in a console and allows you to choose to either encrypt a message, decrypt a message, or break the cipher text to a message. The layout is very simplistic and it reads plaintext and cipher text from files. It also will write to files when needed. The Vigenere cipher was very significant when it was invented. This cipher impacted our world as a form of formidable encryption for nearly 300 years.

05.06.06  Prime Propagator

Rad Alrifai, Colin Clinton,

Northeastern State University

Prime Propagator is an application used to generate prime numbers. Normally, prime generators use a formula to come up with a possible prime, test it, store it in an array if prime, and then increment a counter. On the other hand, Prime Propagator uses a unique approach. It stores its outputs (the primes) into a linked list to be used as inputs to the upcoming sequences of calculations to generate more prime numbers. The software for Prime Propagator is written in C++. The Prime Propagator application consists of the following four main components: A linked List for storing the prime numbers, a mathematical calculation module to identify probable prime numbers, an input algorithm to evaluate numbers stored in the linked list as candidate for additional processing, a factoring function to verify whether a given result is a prime number or a composite number.

05.06.07  Njord: A web application Controller

Rad Alrifai, Justin Smith,

Northeastern State University

As the Internet is growing and new tools are emerging such as AJAX, HTML5 and WebGL, the need to rapidly and efficiently develop web applications is becoming increasingly critical to almost every business. Njord is a web application controller developed to increase the reuse of the interface between backend application software and web applications. By reducing the amount of time spent on coding, programmers can concentrate more on the software functionality rather than implementation. This web application Controller was developed using several technologies including: Bottle.py to handle routing and access to HTTP environment, PyMysql to extend the functionality of MySQL database, MySQL to manage relational data, Mongo to manage NoSQL database, and Git to control the various revisions of source code.
05.06.08 Early Rise Alarm

Rad Alrifai, Christopher Allen,

Northeastern State University

Waking up on time is a problem many people struggle with on a day to day basis. Whether it be oversleeping or hitting snooze one too many times, many people could benefit from a more effective way to wake up each morning. The best place to implement a feature that would accomplish this would be the first thing most people interact with every morning, an alarm clock. With more and more people using alarm apps on smartphones, a good place to improve current alarm designs would be through mobile apps. When most alarms go off, usually no action is required other than choosing off or snoozes; this functionality can be improved. The Early Rise Alarm contains a math function feature contains a simple equation to be solved in order turn off the alarm. This web application was developed using objective C and Apple’s IOS platform.

05.06.09 Construction project management software (#CPM)

Rad Alrifai, Daniel Gibson,

Northeastern State University

Construction project management software (#CPM) is interactive applications that can help users learn the basics of construction management and its business practices by playing games. The game covers various topics involving bidding, scheduling, cost, project management decision making and final project completion. The goal is to let the enthusiasts control a project to ultimately succeed by beating the cost and delivering the project on time. To complete a game, the user needs to make various decisions and perform several tasks. Each completed decision and task has its own perks and its repercussions. There are fun interactions as well as sudden mishaps that can arise in construction that must be handled to ensure successful project completion. The ultimate goal is to help the user understand construction management and its practices in a fun interactive way. The audience of #CPM would include construction companies, Universities, Colleges, Tech/Trade Schools, and others who are generally interested in construction management.

05.06.10 Volunteer Portal

Rad Alrifai, Daniela Odell,

Northeastern State University

Technology provides the fastest, easiest form of communication in today’s world. My goal is to broaden the hopes of volunteers to help in their community and give the volunteer organizations the opportunity to seek out volunteers, by creating software to make communication and connections easy and fast between volunteers and organizations. Volunteer Portal should allow volunteers to give back to their community by giving them a convenient and easy opportunity to connect to volunteers in the Tulsa, and surrounding areas. Volunteer Portal is a website which includes many features and contains a web application. By using this website, volunteers can log in, browse organizations, and add their own information for organization viewing. Organizations should be able to log in, browse volunteers, and find the best match for the volunteer openings that they are searching for. This web application was developed in C#.
05.06.11  Lawn Gnomie: An Android Application

Rad Alrifai, Bridgette Cowden,
Northeastern State University

Most Android games are too hard for children to play which quickly makes them lose interest in the game. Lawn Gnomie is a game that is simple, child friendly and gives the child a character that would pique their interest in the game right away. Lawn Gnomie is an easy to play game that is based on the classic 1970s game ‘Snake’. The game gives a colorful child-friendly atmosphere and simple game mechanics. The gameplay mechanics are two buttons, a left turn and a right turn, making it very easy for a child to pick up and understand how to play. The gameplay logic is simple in itself. Because children love cartoons, the game was built in a cartoony style including the background, font, character, items and even sound. The theme was created to pull the child into not only the gameplay but the images surrounding it. The impact of its use is to give children an entertaining Android game that they can understand.

05.06.12  Computer Science Jobs Application

Rad Alrifai, David Boling,
Northeastern State University

One of the project’s goals is to provide Computer Science faculty with a single place to post any internship or employment opportunities they may receive. The second goal of the project is to provide Computer Science students with a single place to search for employment or internship opportunities without the need to visit with each professor individually. The system administrator, however, has to be able to not only search the database, but also add jobs, employers, other administrators, job seekers, and contacts to the database. The administrator also must have the ability to remove jobs, employers, other administrators, job seekers, and contacts from the database. The software was developed using C# and Microsoft SQL Server Database.

05.06.13  Point Of Sale System

Rad Alrifai, Charity Henson,
Northeastern State University

This software is a point of sale (POS) system that manages sale transactions and to simplify book keeping. This software will allow the user to calculate the bill of a customer, edit specials and menu items, edit transactions, and keep track of sales using a specified time period chosen by the user. The menu items and checkout information will be stored in a database. This software application was developed in C#, MySQL, .NET Connector, and MySQL Workbench.
05.06.14 An Android Shopping Platform

Rad Alrifai, Brent Spencer,

Northeastern State University

Customers often have trouble finding prices and other information about items when shopping at retail stores. This application helps customers to find information about items in the store by using their mobile phone. The software can scan the bar code of an item to retrieve information about it from the store database. The application sends a message to the database to request the needed information about the item before allowing the user to add that item to the shopping cart. The application uses the camera to scan a barcode then sends it to the database to match against data stored in the catalog class. The code can then displays the retrieved information about an item before adding it to the shopping cart.

05.06.15 Fast Strong Planning for FOND Problems with Multi-Root DAGs

Andres Calderon Jaramillo, Jicheng Fu,

University of Central Oklahoma

We present a planner for addressing a difficult, yet under-investigated class of planning problems: Fully Observable Non-Deterministic (FOND) planning problems with strong solutions. Our strong planner implements two novel ideas. First, we employ a new data structure, MRDAG (multi-root directed acyclic graph), to define how the solution space should be expanded. We further equip a MRDAG with two heuristics to ensure planning towards the relevant search direction. Results show that our strong algorithm achieves impressive performance on a variety of benchmark problems: it runs more than three orders of magnitude faster than MBP and Gamer and demonstrates significantly better scalability.

05.06.16 Solving Karnaugh Maps on Mobile Devices

Hong Sung, Toan Nguyen,

University of Central Oklahoma

Karnaugh map (K-map) is an engineering tool to optimize combinational circuits. This project was to implement an application program to solve K-map on Android mobile devices with simple user interface. The user interface is similar to that of a calculator. It is made of a two-dimensional array of buttons. Touching each button will cycle its value from 0 to 1 to X (don’t care) and back to 0. Upon entering input values, the user can press the solve button to show all possible solutions. The prime implicants (PI’s) are highlighted on the K-map grid. Essential PI’s (EPI’s) are highlighted red while non-EPIs are highlighted green. If both EPI’s and PI’s are overlapping, such cells are highlighted orange. In addition to color-coding, the program displays PI’s one by one by selecting Next or Prev button. This project utilized Quine-McCluskey algorithm to find all PI’s. Using the results of this algorithm, Petrick’s method was utilized to identify all optimized solutions. The program was tested and demonstrated on an Android smartphone with 600MHz CPU. The performance was satisfactory. User touch input is instantaneous. The computing time does not exceed two seconds for four-variable K-maps. The optimized solutions are verified by hand and from class homework solutions. All of the main expectations match with the objective of the project.
05.06.17  **Simplified Angry Birds**

Hong Sung, Vinh Luong,

*University of Central Oklahoma*

Mobile gaming on highly portable and interactive touch-based devices, such as smartphones and tablets, has become a hot trend in recent years. Some would agree that it is potentially becoming the next-generation of gaming platform. This project attempted to create a physic-driven game similar to one of the most popular games in the mobile market, Angry Birds. This game was developed on Android operating system. To keep things simple yet effective, the game was designed and programmed using object-oriented principles and standard Java programming language on the Eclipse Integrated Development Environment. Furthermore, in physic-simulation, which is the core of the game engine, rectangle shapes were utilized to simplify collision detection among objects. The end result was an interactive game that plays like the original Angry Birds, but without using sophisticated and dedicated graphics library such as OpenGL. Overall, this project has shown the practicality in creating simple animation-based games using standard Java language for the mobile computing platforms.

05.06.18  **Increasing the Experimental Speed by Automating Data Generation**

Paul Wiechmann, Jicheng Fu,

*University of Central Oklahoma*

In this work, we attempt to automate the generation of experiment data, which can help find the most relevant set of attributes, from a set of twelve available attributes, for determining optimal power wheelchair tilt and recline settings for the prevention of pressure ulcers in patients with spinal cord injury. Attributes are added one at a time to a set of core attributes and are evaluated using four well-known classification algorithms, namely, artificial neural network, support vector machine, J48 decision tree, and random forest. The process is performed iteratively, using the attribute set with the highest percentage of correct predictions as the new core set, until the accuracy stops improving. The program was implemented in Java, using the machine learning software WEKA for the classification algorithms. File generation was implemented in C++.

05.06.19  **Fairness Bandwidth Allocation in Multimedia's Multicast**

Lie Qian, Sky Pettett,

*Southeastern Oklahoma State University*

Multicast is an efficient mechanism for delivering data to multiple receivers. Layered multicast schemes enable efficient distribution of real-time multimedia traffic over heterogeneous networks like the Internet. To achieve fair bandwidth allocation in layered multicast, different max-min fair allocation solutions were proposed. Our scalable distributed max-min fair bandwidth allocation algorithm does not maintain per-session information in core routers; therefore has $O(1)$ storage complexity in core routers.
From linear equation to Secure communication using operational amplifier circuit

Quinten Walker,

Langston University

Many attentions have been paid to the fundamental research of chaotic systems. Recent increase in its popularity is due to its proposed capability to benefit the field of communication, such as security and encryption and cryptography, multipath, and spectrum spreading. The main security goals are privacy and authenticity of the communicated data. The symmetric encryption setting considers two parties who share a key and will use this key to imbue communicated data with various security attributes. Chaotic systems have been proposed as an efficient encryption machine if synchronized. Through the synchronization of coupled chaotic circuits, information can be scrambled and descrambled effectively. However, most circuits presented are complex and difficult to implement experimentally. Recently, numerous researches have been devoted to design simpler chaotic circuit. This work focuses on jerk equations and their electronic circuit implementation. It presents a step-by-step approach of solving differential equations using inexpensive electronic components. The numerical solutions obtained using Scilab and simulations using Multisim 11 are compared to experimental results. Then it uses to build jerk circuit that exhibit chaotic behavior under certain conditions. It extends to synchronization of two independent jerk chaotic circuits. Chaotic signals are unpredictable, yet they can be synchronized in a way that can be beneficial to the encryption and secure communication field of study.

Wheelchair Maneuvering Skills – Teaching Young Children to “Drive” Wheelchairs

Susan Hanks, Jicheng Fu,

University of Central Oklahoma

Learning how to drive a wheelchair can be a difficult and time-consuming process, especially for children. As they are learning, they are more exposed to harming themselves and others. This research project offers a safe solution. By using computer simulations, users can practice their driving without fear of injury, allowing them to take risks without consequences. This will help them gain confidence in using their wheelchairs as well as enhance their reflexes and hand-eye coordination. There have been many challenges in working with this simulation. The collision detection is probably the most significant challenge. Precision and accuracy is needed. There are three possible methods. The first method is to have bounding rectangle around the objects. When two rectangles intersect, collision is indicated. Unfortunately, this is not very precise. The second method compares all of the pixels in the wheelchair to the pixels in the object that it may be hitting. Any intersecting pixels will be checked for transparency. Transparency indicates collision has not happened. Although it is more precise, it is also time-consuming. The third method is to combine the previous two ideas. Checking for rectangle intersection first increases the speed and the pixel comparison will increase precision. This project’s aim is to allow users to become more proficient in the use of wheelchairs and gain confidence in their ability without injury.
Using Software Design Principles to Model a Bioinformatics Software Project

Wenxi Zeng, Jicheng Fu,

University of Central Oklahoma

Object-Oriented Programming (OOP) has become the most popular way when we design and implement software. Novice software developers tend to mix up everything in big classes. However, OOP is not only about programming, but also includes Analysis (OOA) and Design (OOD). In the prototype of our Wheelchair Simulation System, we created two big classes SimEnvironment and WheelChair to represent map and wheelchair, respectively. Then we have two classes OpenEnvironment and Track to inherit from SimEnvironment. However, this was conceptually inaccurate. In the real-world world, we not only have maps and wheel chairs, but also many other things, such as Pedestrians. We tackle the difficulty of modeling by using abstractions, i.e., creating interfaces, such as the visible, moveable, collideable, and rotatable interfaces. Then, we let a specific class implement an interface when necessary. For instance, the wheelchair class implements the visible, moveable, collideable, and rotatable interfaces. In contrast, the track class only inherits the visible and collideable interfaces.

Global Grids and Volunteering Computing

Warren Moseley, Mary Phillips,

Southwestern Oklahoma State University

There are hundreds of thousands of personal computing devices that sit idle each day. This translates in to many machine cycles that go to driving screen savers. The BOINC Project at Berkley was a groundbreaking experiment in the area of volunteer computing setting the groundwork for allowing people to volunteer machine cycles to a joint computer effort. The BOINC project of Berkeley University is one that can revolutionize the way that we solve problems. According to the BOINC website, you can “Use the idle time on your computer (Windows, Mac, or Linux) to cure diseases, study global warming, discover pulsars, and do many other types of scientific research. It's safe, secure, and easy. The Berkeley Open Infrastructure for Network Computing is an open source middleware system for volunteer and grid computing. An open source middleware system is software that the developing company makes easily available to the public; the software is the bridge between multiple applications, often on different operating systems, such as with messaging and queuing software. According to Wikipedia, The BOINC project started in February 2002 and the first version was released on 10 April 2002. Using the power of personal computers from all around the world, solving large problems such as climate control or even searching for extra-terrestrial life are in our reach.
**05.06.24 Cache Memory Simulation**

**Thomas Turner, Eric McDonald,**

*University of Central Oklahoma*

A cache is a small store of very fast and costly memory that enables computers to execute programs much faster that would be possible without this device. Although programs are large and need, on occasion, quantities of information, neither the instructions nor data are referenced randomly. The pattern of memory references occasioned by executing a computer program is called locality of reference. At any one time, a program executes a fraction of the instructions that comprise the total program and accesses only a small portion of the data managed by the program: it is this feature of a program that makes a cache possible. If we can put the instructions and data that are used by a program in the moment that they are needed, we can benefit from the very fast memory of the cache to execute the computer program. At the same time we also benefit from having slower, cheaper memory to store the part of the program we are not executing. In this way, we benefit from having relatively fast execution at a relatively economical cost. This poster, titled Cache Memory Simulation, documents a simulation illustrates three cache designs. The purpose of the simulation is to aid students in their understanding of this aspect of computer architecture.

**05.06.25 How Kalman filter can help us?**

**Yuqing Yan, Jicheng Fu,**

*University of Central Oklahoma*

Kalman filter is an algorithm designed to reduce the noise of data collected in some process over time. It is a set of mathematical equations which can be easily implemented to provide an efficient computational means to estimate the state of a process. It works in a two-step manner. In the prediction step, the Kalman filter produces estimates of the current state variables, along with their uncertainties. Once the outcome of the next measurement is observed, these estimates are updated using a weighted average, with more weight being given to the estimates with higher certainty. Because of the algorithm's recursive nature, it can run in real time using only the current input measurements and the previously calculated state; no additional past information is required. We applied Kalman filter in our research to filter out the noise associated with acceleration data collected by accelerometer sensors. Our experimental results show that Kalman filter did smooth out the noise and yield smoother curves for subsequent analysis.
05.06.26  Model-Driven Development: Where Does the Code Come From?

Jicheng Fu, Jianbin Wu,

University of Central Oklahoma

Model-driven development (MDD) drastically changes the traditional view of software modeling, which no longer serves merely as documentation that will be put aside at a certain point during the development. Instead, MDD has made models a part of the development process. As a result, software designers and developers can focus on high-level problem solving instead of low-level implementation details. However, the current research focus is on model transformations and overlooks the importance of code generation, which includes the generation of infrastructural code and business code. In this study, we analyzed the root cause about why existing MDD approaches are only good at generating the infrastructural code, which is the static aspects of the system. Then, we proposed a comprehensive approach that considers functional, dynamic, and object modeling. Our approach is able to generate both infrastructural and business code. Finally, we conducted a case study to evaluate the proposed approach. Through this case study, we identified some insights on automated code generation in MDD. Our results demonstrate that it is not only likely, but also possible to fully automate the code generation process in MDD.

05.06.27  A Comparison Study between Compressed and Uncompressed Inverted Indexes for Memory Constrained Devices

Gang Qian, Grzegorz Bugaj,

University of Central Oklahoma

As the number of applications grows on smart devices, there is a need to efficiently index and query their documents within given memory constraints. This study was done to determine the feasibility of using compressed in-memory inverted indexes for embedded devices. We focused on comparing compressed indexes with their uncompressed counterparts in terms of their memory consumption, retrieval speed and storage usage. Data sets used for the test was Reuters – 21578, and target platform is Android. The results of the comparison study is reported in this poster.

05.06.28  Characteristics and Applicability of Commonly used Classification Algorithms in Data Mining

Gang Qian, Rui Zhang,

University of Central Oklahoma

Data Mining is an inter-disciplinary field that offers a spectrum of tools and algorithms to discover useful information and patterns from a huge universe of data. Because of the number of available algorithms, it is often difficult to choose a suitable algorithm for a given application. In this poster, we study seven commonly used classification algorithms, including decision tree, rule-based classifier, lazy learner, naive Bayesian, Bayesian network, artificial neural network, and support vector machine. Features and characteristics of the seven algorithms are compared and presented based on such criteria as construction cost, classification speed, expressiveness, stability, applicable data types, and easiness of handling of irrelevant, correlated or missing data. The goal of the project is to provide data mining practitioners with a guide to choosing the right classifier for their corresponding application domains.
05.06.29 An Approach for Raising Female Information Assurance and Security Workforce

Myung Ah Park, Michelle Hepner,

University of Central Oklahoma

The gender inequity in the IT field has been addressed with different approaches such as outreach programs for middle/high school female students and gender-inclusive instructional methods to retain female students in the IT-related disciplines. However, efforts to promote future female IAS workforce have rarely been conducted although the gender inequity in the IAS field is even starker than it is in the general IT area. In this work, we will discuss problems with existing approaches for IAS education and propose a holistic IAS educational strategy which not only addresses those problems but also may be effective in bringing up a female workforce for the IAS field. Finally, we will discuss the experiences in our first attempt to implement the proposal.

05.06.30 A Mobile Cloud Computing Platform for Capturing Power Wheelchair Maneuvering Patterns

Travis White, Eddy Rajiah, Jicheng Fu, John Sluder,

University of Central Oklahoma

Power wheelchairs are widely used to enable disabled persons to acquire independent mobility, which is important for health status, quality of life, social participation, etc. However, wheelchair driving could be challenging due to the users' pathologies, poor maneuvering skills, and adverse environments. As a result, wheelchair accidents constantly occur. It is therefore critical to capture wheelchair driving patterns on which intelligent, safe control modules can be developed. Compared to traditional sensors of high cost and low availability, smart phones and cloud computing provide an ideal solution to collect and analyze wheelchair driving data in real-time. In this project, we used gyroscope and accelerometer sensors in the smart phone to collect driving data. Machine learning methods, e.g., KNN, were then used to analyze the data. However, smart phones are not practical places for intensive computations and data storage. Cloud computing complements mobile computing via outstanding computing and storage capabilities. In our platform, data collected by the smart phone are sent to the cloud for storage and analysis. The results are then made available to users of various devices. Our experiments with the smart phone and cloud computing demonstrated that we could leverage the advantages of both techniques yielding the mobile cloud computing platform. This platform is useful to quantify driving patterns, recover trajectories and gauge activity and participation.
Analyzing Wheelchair Motion Data

Ying Zhang, Jicheng Fu,

University of Central Oklahoma

This study is a part of an intelligent wheelchair project. The aim is to analyze wheelchair driving data to capture patterns. All the data were collected using accelerometers. Specifically, there are six basic wheelchair motions: moving straight forward and backward, turning left and right, and stopping and starting. We also found that transitioning data existed between any two motions. However, values of the transition data are different. To reduce the variations as much as possible, our protocol used wheelchair’s staying put as landmarks. Before taking any motions, the wheelchair remains stationary for 2 minutes. Hence, we could easily identify these landmarks from the acceleration data. Based on sample data, we could classify new data using KNN (K-Nearest Neighbors) in Matlab. A new data item is classified based on the similarity to the majority of its K closest neighbors. We tried different K values and found that the best K is 4 just in our test model.

Wheelchair Simulation Prototype

Devin Allen, Jicheng Fu,

University of Central Oklahoma

The purpose of this research has two parts: 1) to create wheelchair simulation software that will help developers test and refine some artificial intelligence techniques that will be used in real wheelchairs later, and 2) to explore the depths of video game & simulation software development while creating a simulation software that can be used to train new users before they use an AI enhanced wheelchair. We used Microsoft XNA gaming platform to develop the software prototype (2-D). Later, we will migrate our 2-D simulation system to 3-D, which will be more intuitive and will enable the wheelchair users to learn driving faster. In our simulation the movements of the wheelchair can be controlled by any joystick that supports Microsoft Direct X. Furthermore, our current prototype implements a track that the user can drive on by using a joystick to control a 2-D avatar in a wheelchair. A collision detection method suitable for the curved path of the track has been implemented, but it still has a large room for improvements.

Building a Secure Web site over ASP.NET

Alyssa Baay, Myung-Ah Park,

University of Central Oklahoma

Nowadays, everything is done over the Internet. With just a single click, one can go through million websites that provide information one is looking for. However, because of this innovation, one’s identity may be at risk. In this work, we will present a web server running over ASP.NET that employs the security measures to prevent two most serious web attacks, namely SQL injection and Cross Site Scripting (XSS). We will show how these measures keep the site secure by applying the said measures and then trying to exploit the site.
**05.06.34 Knowledge Management for Small to Medium sized Businesses in Rural Western Oklahoma.**

Warren Moseley, David Britton, Michael Brinkley, Patrick Spears,

*Southwestern Oklahoma State University*

This project is about applying the Dynamics of Research in Knowledge Management from Corporation on a Large Scale to Small to Medium size businesses in Rural Oklahoma. In addition to the Knowledge Sharing and Research Sharing the goal was to apply the foundations and principles of the Malcolm Baldrige National Quality Award to small businesses. This project provides, training, consulting,and a framework for tools to support the ability to innovate by allowing Knowledge to become an asset and treating as such. What makes this project unique is the focus on quality as a result of using the Malcolm Baldrige Criteria for Excellence as provided by the National Institute of Standards.

**05.06.35 Grid Computing for 3d images and animation.**

Warren Moseley, Aaron Wilson, Hayden Harrington,

*Southwestern Oklahoma State University*

This project consisted of studying different hardware and software configurations for utilizing parallel and network configurations to produce high quality photorealistic pictures and animated sequences. This project produced a series of short animated clips and put the results into a consistent story. The current approach to animation and digital image sequencing parallels the activities found in the Software Life Cycle and the Software Processes of the late eighties and early nineties. It became evident in this time period that there was a need to apply proven Object Oriented Analysis and Design Techniques to support the generation of robust and repeatable Software Systems. This project demonstrated that the same cognitive functions found in the Object Oriented Software Development Process can be readily applied to the creation of digital storytelling and digital animation. Computer Animation and Digital Storytelling require time-intensive and space consuming algorithms to accomplish the task. Rendering is the process of generating an image through computer programs from a mathematical or graphical model that describes 3-D objects. Rendering is a computationally intensive process, and parallel processing is required to complete rendering jobs in reasonable time. We have installed, configured and evaluated some of the proprietary software and some of the available open source software for rendering.
Improving Crime Analysis Through an Examination of Auto Burglary: Edmond, Oklahoma

Emelia Chrisco,

University of Central Oklahoma

The city of Edmond, Oklahoma presented with a problem of auto burglary. It is a crime that has gone unevaluated and not suitably dealt with due to a lack of resources within Oklahoma law enforcement. The Edmond Police Department currently has plans to expand into a new building with the possibility of developing the Crime Analysis Department, which currently consists of only one officer. It has come to the attention of researchers that there is a high potential for strategic growth that would bring a structured allocation of resources which would in turn boost efficiency, effectiveness of manpower, and productivity. A review of the literature suggests that police departments of all sizes benefit from having a dedicated crime analysis department. The literature stresses department effectiveness through educated individuals working with the proper tools. With the use of data mining and geospatial software, an educated Crime Analyst can create tactical strategies that are more efficient. Utilizing the Automated Tactical Analysis of Crime software (ATAC), which features custom filters and advanced data mining technology, researchers will locate the three main hot spots of auto burglary. Once those hot spots are identified, further geographical analysis will be conducted. Aspects of the environment will be evaluated to find trends that might promote or create the opportunity for auto burglary.
05.07.02 The Stillwater Auto Burglary Project: A Multidisciplinary Pilot Study

James Lofton, Emelia Chrisko,

University of Central Oklahoma

Auto burglary is a major problem in Stillwater, OK. The problem is aggravated by a lack of prosecution, low victim awareness, unlocked vehicle doors, and personal property left in plain view of potential offenders. The Stillwater Police Department approached the University of Central Oklahoma’s Center for Innovative Solutions seeking to mitigate this problem. Several studies of successful programs for reducing auto burglaries within individual cities have been reviewed. Primarily, these studies have shown that programs focused on a singular-discipline approach tackling the problem from one angle. Utilizing the Automated Tactical Analysis of Crime software, a total of three hot spots were identified as being the best option for implementing intelligence led crime prevention strategies. Numerous tactical solutions will be implemented to include directed patrol in hot spot areas, a system of Potential Economic Loss Prevented cards to track the monetary savings to the community, door hangers that describe the problem and provide awareness and prevention tips, and ultimately increased prosecution. Additionally the Center for Innovative Solutions has partnered with UCO’s Mass Communication Department to implement community outreach programs that include modern social media outlets, a landmark solution to auto burglary. The hopeful outcome of this program will be a sustainable, multidisciplinary approach that appreciably reduces auto burglary in Stillwater, Oklahoma.

05.07.03 The Effects of Carbohydrate Concentrations on Heat Shock Protein Expression in Daphnia magna

Crittell Charles, Charles Biles, Morgan Dickerson,

East Central University

Individuals with diabetes mellitus, Type 1, often experience reduced expressions of chaperone proteins, most specifically heat shock proteins (HSPs). These proteins play a key role in the immune system's response to stress through the regulation of protein synthesis and folding patterns. The purpose of this study was to determine if Daphnia magna could be used as a vector to study the relationship between heat shock protein expression and diabetes. Daphnia underwent various heat treatments to determine the time and temperature in which suspected HSPs were expressed. A standard heat treatment was then performed on daphnia exposed to various glucose molarities to determine the effect of carbohydrate concentrations on the suspected HSPs expression. It was determined that a possible HSP with a molecular weight of 22.6 kD appeared after 15 min in 33 °C. Results also showed a positive correlation between total protein production in daphnia and increasing sugar molarities.
Uses for Flyash in educational learning materials

Wayne Glass,  
*University of Tulsa*

To be determined

Emissions Solutions through Advancements in Selective Catalytic Reduction Systems

Jeremy Massey,  
*University of Tulsa*

In today’s society, protecting the environment from dangerous pollutants is becoming ever more important. MIRATECH gave the researchers the opportunity to solve this issue by developing a selective catalytic reduction (SCR) system. This technology has existed for quite some time and is instrumental in reducing the amount of nitrous oxides that are produced from combustive systems. The main objective was to install and test new applications for a SCR system that would potentially lead to simpler design and operation, while also improving the efficiency of the system. This assignment coexisted with several other projects including the design and installation of MIRATECH’s new Innovation Center, making them a world leader in emissions solutions testing. Nitrous oxides need to be removed from the environment because they are considered by the United States Environmental Protection Agency as “criteria air pollutants” and ozone precursors. Further advancements in SCR systems will lead to a healthier population, greater potential for cities to meet the air quality standards set by the EPA, and a cleaner environment for generations to come.
05.08.03 Temperature Compensation for Transmission Crystals

Stephan West,

University of Tulsa

This work reports the reasoning and process used to compensate for the temperature variation within the crystals used at Qual-Tron. Qual-Tron uses a 5MHz crystal in most of their transmitters. This crystal plays a large role in determining what frequency the product transmits on, but has a small fault in it. Due to the crystal, the transmission frequency varies with temperature. Before we had found what we thought was an average curve (parts per million vs. temperature) and created an offset curve that could compensate for it. As time went on and we used this curve on more units we began to realize that the variation between crystals was too great, and one compensation curve was not going to work for every crystal. I was then tasked with a two part project. First, I needed to find a way to compensate each crystal individually without having to run a temperature test on each unit. The compensation had to get their transmission frequency to stay within five parts per million (PPM) between -40°C and 65°C. Secondly, I needed to make a program for production that could be used to compensate the crystals.

05.08.04 The Design and Building of a Wind Powered Tesla Turbine

Baha Jassemnejad, Weldon Wilson,

University of Central Oklahoma

Nikola Tesla designed a bladeless turbine in order to achieve a high efficiency electric generator powered by steam. We will explain our design of this turbine and how it is operated by natural elements, the wind. We will also present a hybrid version of Tesla’s turbine.

05.08.05 Redundant Communications Processor with Simple Network Management Protocol Monitoring

Baha Jassemnejad,

University of Central Oklahoma

The Federal Aviation Administration (FAA) requires redundant communication paths for any runway with the Category III listing. This redundancy is currently controlled by DataProbe’s Automatic Protection Switch (APS). DataProbe has discontinued the product, and the FAA is needing a replacement. Instead of trying to find another 3rd party vendor for a system that would meet the requirements, they decided it would be a better investment to have a team of engineers design and develop such system that the FAA would own. Our task was to complete the “proof of concept” process that a previous design group had started (taking it to the next step of a full prototype), and integrate Simple Networking Management Protocol (SNMP) into the system.
05.08.06  Design and Development of a Digital Impedance Analyzer

Baha Jassemnejad,

University of Central Oklahoma

Today there are many commercially available impedance analyzers. These devices have many features and cater to a wide range of applications. They offer a wide range of test frequencies, and they can display many parameters such as phase shift. However, their major drawbacks are size and cost. Often, technicians in the field are only concerned with the real component of impedance measured at a specific frequency. The purpose of this project is to build a portable, handheld, digital impedance analyzer to be used by technicians in the field.

05.08.07  Design and Optimization of a Modular System for Biofluids Research

Baha Jassemnejad, Evan Lemley, Phd,

University of Central Oklahoma

Research over the renal artery network with (RAA) and without (RA) a deforming saccular aneurysm as well as on tissue PolyL-lactic acid (PLL) scaffolds has been previously done by the University of Oklahoma. However, confirmation of their computational fluid dynamic simulation of pressure drops for the renal artery network (2D) results needs to be obtained [1] as well as their porosity and flow characteristics for tissue scaffold. It is for that reason that 3D models have been created to run 3D simulations in Gambit 2.4.6 and Fluent 6.3.26 for both RA and RAA networks. According to our simulations results the pressure difference between the two types of arteries was 7.8 mmHg, this is different from their given results of 0.9 mmHg.

05.08.08  Building of a Portable EEG Monitor

Baha Jassemnejad, Yuhao Jiang,

University of Central Oklahoma

The project is about designing and building a Portable EEG Monitor that can record electric signals from the brain and transmit them to a computer wirelessly in almost real time. This monitor is cheap and affordable to the public and can be easily carried around.

05.08.09  Design and Testing of Wireless Energy Transmission

Baha Jassemnejad, Weldon Wilson,

University of Central Oklahoma

As time progresses technology increases at an exponential rate. Consumers want for the next big thing and manufactures keep up with this demand. We are living in the wireless age. People carry phones in their pockets, and computers that need no cables. Media devices such as game consoles have gone to a point where you are no longer tethered to the system with a cord. Everyone is wireless yet they still need to plug in to charge their electronic devices. The concept of wireless energy transmission has been available for over one-hundred years but only recently has its potential been realized.
05.08.10 Design, Fabrication and Mechanical Characterization of Polyethylene Glycol Diacrylate (PEGDA) for Tissue Engineering Applications

Baha Jassemnejad, Morshed Khandaker,

University of Central Oklahoma

One of the principal challenges in tissue engineering, especially with the production of large tissue constructs, is the cell survivability within the scaffold. Several researchers developed porous 3D scaffold where oxygen and nutrients can slowly diffuse for the proper cell growth inside the scaffold. Due to limited diffusion of oxygen and nutrients, the cells placed at a certain depth (usually 3 mm) within the tissue construct do not receive adequate nutrients. For which the cells die at that depth which lead to improper tissue regeneration in the scaffold. Currently, there is a necessity to design nutrient conduit networks within the tissue construct to enable cells to survive in the matrix. In this study, tissue constructs having the nutrient conduit networks were designed and were fabricated with UV-photopolymerization process. Polyethylene glycol diacrylate (PEGDA) was used as a fabrication material. After the design and fabrication was completed, mechanical characterization was conducted to examine the mechanical properties of the tissue constructs.

05.08.11 Automated Modular Optical Tweezers

Baha Jassemnejad,

University of Central Oklahoma

Since its inception, optical trapping and manipulation by means of lasers has provided a useful way to study microscopic dielectric particles, tissue cells, and cellular organisms. An Optical Tweezers (OT) system is developed here that is both modular and automated; the OT apparatus is entirely composed of breadboard components and controlled by computer. The advantages of this approach are that the system is (1) easier to modify, (2) less expensive, (3) easily repairable, (4) user-friendly, (5) faster, and (6) less prone to random error. Due to its versatility, this type of modular, automated OT system will see applications in extreme conditions, such as deep-sea, subterranean, and extraterrestrial environments.

05.08.12 Automation and Control of a Satellite Antenna Positioning and Alignment System

Baha Jassemnejad,

University of Central Oklahoma

The proposed satellite antenna control revolves around dealing with geostationary satellite communication systems. Geostationary satellites have an equatorial orbit, with each satellite corresponding to a section in the sky where a satellite dish is pointing. Stationkeeping for the satellites providers requires them to move the spacecraft within the allowed tolerance for every specific slot in the sky. As the satellites become older, the providers attempt to extend their lifetime by conserving thruster fuel. The fact that the satellite is not in a stationary position requires for a system to be in place in order to maintain signal quality by moving the dish on the ground. The system produced would use software driven motors in order to direct the antenna in the proper direction to maintain signal strength. The system would process the signal received, and use an internal stochastic algorithm in order to determine the maximum power position, which corresponds to the position of the satellite in the sky. The random velocity vectors used in a stochastic algorithm would be able to avoid local extrema and dynamically adjust to find the actual satellite position regardless of any other interference. The device would be able to be deployed in remote and harsh locations that makes travel both a costly endeavor and one full of technician risk.
05.08.13 Power Oscillator for a Transcutaneous Energy Transfer – TET System

Baha Jassemnejad,

University of Central Oklahoma

Transcutaneous Energy Transfer (TET) systems are used to supply wireless power to implanted biomedical devices by electromagnetic induction. Performance power oscillators are required for creating dynamic inductive links between transcutaneous coils in order to allow efficient power transfer. This research includes the study, analysis, and design of power oscillators that utilize low-power piezoelectric crystals to provide high frequency stability to maintain maximum power transfer. Several electronic oscillator configurations are considered and multiple experiments are being conducted to test their efficiency, evaluate their performance, and determine their main differences for usability in TET systems.

05.08.14 Automation and Remote Control of an Astronomical Observatory

Baha Jassemnejad,

University of Central Oklahoma

The Selman Living Lab, located in northwest Oklahoma, is an astronomical observatory and biological research station which is owned and operated by the University of Central Oklahoma. As an astronomical observatory, it consists of two manually controlled domes, one of which is currently housing a 12’ reflector telescope. In order to improve the utility of this remote station, an automation and control system is needed to enable both remote and automated observing. The purpose of this project is to devise a modular system that can easily enable the automation of a typical ash dome/observatory setup. This system makes use of various sensors to track the movement of any telescope stationed in the dome, and moves the dome to match the orientation of the scope. The telescope is then driven by commercially available software designed for the telescope model currently in use at the observatory. Safeguards will prevent the dome from being opened and operated in poor weather conditions, and an automated dust cover and solar filter will protect the optics from the sun during solar observing.
05.08.15  Virtual Test Impairment Measurement Set

Jeff Fallon, Anh Ho, Jonathan Adams, Juan Orozco,

University of Central Oklahoma

Transmission Impairment Measurement Sets (TIMS) are equipment widely used in the communications field to test the performance and reliability of analog lines. TIMS provide the communications industry with a useful tool to analyze impairments a line might be experiencing and the information needed to isolate and correct problems, such as low voice and data quality. Current TIMS are stand-alone devices that lack automation to perform the necessary tests. Transitioning from standard stand-alone devices to user-defined devices allows for automation of the testing processes and helps with improving efficiency, accuracy, flexibility, durability, and functionality. Virtual instrumentation provides us with the technology to accomplish this, and, at the same time, it facilitates future improvements and modifications. The main objective of this project is to develop a user-defined virtual instrument that will advance functionality and improve the quality of the transmission impairment measurements. This is being accomplished by developing a software application that utilizes a graphical interface environment, NI LabVIEW®, and data acquisition hardware. Using this instrument, testing can be monitored remotely, completed in a timely manner, and supervision is only required for very short periods of time. Implementation of this virtual instrument in the communications field would expedite the maintenance process of analog lines and would expand the versatility of measurement sets.

05.08.16  Stent Contrast Enhancement Filter in Interventional X-Ray Fluoroscopy

Yuhao Jiang, Eranda Ekanayake, Niralee Raichura,

University of Central Oklahoma

Stent, a tiny interventional device which is made of thin steel wires, is difficult to detect because of both contrast dilutions of flat panel detector pixels and quantum and clinical background noise. In this study, a multistage stent contrast enhancement filter is proposed to selectively boost the contrast of stent contour without significantly accentuating the image noise. Specifically, convolution-based directional filter banks are applied to unsharp mask enhanced images to detect stent orientations and edges. The next stage of filter process is to extract the symmetrical parts in the stent. Local symmetry measure is implemented. Combining the information obtained from the last two steps we are able to generate a stent contour map, partially or completely, for partially or fully deployed stent, respectively. The contour map is then scaled by a value determined by a ROC study and added back to the original image to get a contrast enhanced stent image. To conduct the experiments, we use computer generated synthetic images. It is shown that the stent enhancement filter is an effective filter for the improvement of stent visibility in the interventional fluoroscopy. We also found this new filter is advantageous to the unsharp mask filtering from the comparison studies.
05.08.17  Speech Intelligibility of the Temporal and Spectral Speech Coding Strategies

Mohamed Bingabr, Blas Espinoza-Varas, Cedric Tinang, Lingpo Huang,

University of Central Oklahoma

Cochlear implants (CI) stimulate the auditory nerve fibers in the cochlea to restore the hearing sensation in people with severe or profound hearing loss. Continuous Interleaved Stimulation (CIS) is the contemporary CI speech-coding strategy (SCS) and the zero-crossing SCS was recently developed by the first two authors. CIS is based on tonotopic coding the spectral bands of the speech, where low frequency spectral bands activate electrodes at the apex, and high frequency spectral bands activate electrodes at the base. The zero-crossing SCS is based on the zero crossings pattern of the speech time waveform and the waveform amplitude maxima between zero crossings. The time intervals between adjacent zero crossings (speech segment durations) convey information about the instantaneous spectral information in the waveform, longer segments corresponding to low and shorter segments corresponding to high frequencies. The segment duration determines the longitudinal extent of electrical stimulation along the basilar membrane, measured from the base. The maximum amplitude of the waveform within the segment determines the current amplitude delivered to the electrodes. In normal-hearing participants, this paper compares the speech intelligibility of HINT sentences and CNC words processed by each of the two strategies. For HINT sentences, the average speech intelligibility was 99% and 98% for the zero-crossing and CIS strategies, respectively. For CNC words, the averages were 85% and 81%.

05.08.18  Development of Productivity-based Estimating Tool for Energy and Environmental Impact of Heavy Duty Diesel Construction Equipment

Apif Hajji, Phil Lewis,

Oklahoma State University

Although there are already methods and models for estimating productivity rate and emissions for heavy duty diesel (HDD) construction equipment, there currently is not a means for doing all of these at once. This research presents the framework for a tool that can be used to estimate the production rate, activity duration, total fuel use, and total pollutant emissions from earthwork activities. A case study and sensitivity analysis for an excavator are presented. The tool is developed by combining a multiple linear regression (MLR) approach for modeling equipment productivity with the emissions calculation algorithm from EPA’s NONROAD model; pollutants estimated include NOx, PM, HC, CO, and CO2. Furthermore, the equipment fuel use rate is also estimated. Results indicate that the excavator productivity model had high precision and accuracy, low bias and R2 = 92%. The estimating tool proposed in this research will be an effective means for assessing the fuel consumption and air pollutant emissions of earthwork activities and will allow equipment owners, fleet managers, policy makers, and project stakeholders to evaluate the energy and environmental impact of their construction projects.
05.08.19  Modeling the Structural Mechanics of Cilia and Flagella

Gang Xu, Miciah Guy,

University of Central Oklahoma

The goal of this study is to use computational engineering methods to characterize the structural mechanics of cilia and flagella. The ultimate objective is to contribute to providing novel methods for diagnosis and treatment of a number of cilia-related disorders (ciliopathies). Cilia and flagella are nanoscale hair-like structures that bend actively to propel cells or move fluid and materials in airways and other passages. The cytoskeletons of cilia and flagella are composed of nine outer microtubule doublets encircling a central pair of singlet microtubules. Cilia and flagella undergo large bending deformations that are driven by molecular dynein motors fueled by ATP reactions. In this study, we built computational finite element models to simulate our micromechanical testing experiments on the flagella of unicellular algae Chlamydomonas reinhardtii, including bending a single flagellum at its tip or middle length. We found that the apparent flexural rigidity of flagella depends not only on the bending stiffness of microtubules, but also on the mechanical properties of interconnecting components. With proper combinations of mechanical properties of different structural components, the model can reproduce the behavior of actual flagella. Our structural mechanics models combined with experimental techniques provide a powerful approach for improving the understanding of the structural basis for the motile function of flagella and cilia.

05.08.20  Investigation of Artificial Gravity Habitat Dynamics

Geoffrey Kibble, Alyssa Avery, Brian Delano, Calvin Brown, Carolina Vega, Chase Colvin, Jake Hathaway, Jamey Jacob, Ph.D., Jaymie Jordan, Kale Woosley, Reyhan Eusufzai, Shane Spear, Shea Fehrenbach, Steven Asplin, Thomas Verschelden, Zach Barbeau,

Oklahoma State University

Future envisioned missions to deep space elicit problems and challenges not fully investigated by the world’s spaceflight organizations. One of the most prominent issues is prolonged exposure to weightlessness. The human body functions day-to-day with the resistance and force of gravity; in the absence of this phenomenon, bones/muscles swiftly atrophy. Another alarming effect, which has been acknowledged in recent years, is loss of vision due to prolonged spaceflight. Researchers hypothesize that lack of gravity increases pressure on the optic nerve, thus causing vision loss. An effective way to generate a force similar to gravity is to rotate a body to produce centrifugal force. For a small scale investigation of this concept, the Oklahoma State University Space Cowboys team has designed an inflatable beam-rotating experiment. The effects of various internal pressures on the beam’s stiffness and rotational stability will be examined. Inflatable structures are lightweight, have a high ratio of deployed to packed volume, and could provide sufficient support for a rotating spacecraft that produces an artificial gravity force. The experiment is designed to allow the deployment pressure to be altered between test runs (parabolas). As spaceflight becomes more ambitious and missions of longer duration become both desirable and possible, spacecraft designs must provide crew members with an Earth-like gravity environment.
05.08.21  Cellular Anti-Tumor Immunological Responses Induced by Laser Immunotherapy with Immunologically Modified Carbon Nanotubes

Joseph Aquaviva, Ellen Boarman, Wei Chen,

University of Central Oklahoma

An enhanced immune response is vital for a successful cancer therapy. Glycated chitosan (GC) has shown promising results in producing an anti-tumor immune response when combined with phototherapy. GC is also an excellent surfactant. Recently, carbon nanotubes have been used extensively in biomedical applications. Specifically, single-walled carbon nanotubes (SWNTs) have shown enhanced light absorption in the near-infrared (NIR) range. Also, through transmembrane movement, SWNTs act as drug carriers and allow therapeutic agents to enter cells. Using GC and SWNTs, we constructed immunologically modified carbon nanotubes (SWNT-GC). SWNT-GC and GC were incubated with tumor cells to assess the capability of SWNTs transporting GC into the cells, and to determine the toxicity of SWNTs. We also incubated tumor cells, treated with laser-SWNT-GC, with dendritic cells (DCs) and T cells to ascertain the effects the newly constructed immunologically modified carbon nanotubes have on immune cells. The immunologically modified carbon nanotubes increased T cell proliferation and DCs activity, while proving to be nontoxic and capable of entering the cells. Laser immunotherapy with immunologically modified carbon nanotubes is a novel modality for producing an anti-tumor response.

05.08.22  Temperature Compensation for Transmission Crystals

Stephan West,

University of Tulsa

05.08.23  Mercury Robot

Blair Baldridge,

Oklahoma State University

Oklahoma State University has annually hosted the Mercury Robotics competition since 2010. “The challenge is to design, build and remotely operate a robot. The robot must be capable of navigating a maze while being controlled from a great distance. The robot must be able to detect communications problems and provide position information to the operator.” The stated ultimate goal of the mercury robot is to increase the students’ interested in engineering science and technology. Each team has to drive the robot over the internet from a location of 100 miles away. They are given 15 minutes to navigate the maze as many times as they need; whichever team achieves the fastest lap wins the competition. Time penalties are given for whatever team strikes obstacles found in the maze. In case of losing the WiFi signal during navigation of the track, the robot needs to clearly indicate a loss of signal condition. Also, the robot has to be able to park in an allocated parking spot that measures 12 inches in width, and climb up and down a 30 degree angle ramp.
05.08.24 3-Dimensional Profiling of Canine Prostate by Using Sparse 2-Dimensional Axial and Sagittal Trans-rectal Ultrasound Images for Guiding Trans-rectal Optical Tomography Reconstruction

Dhanashree Palande, Daqing Piao,

Oklahoma State University

School of Electrical and Computer Engineering, Oklahoma State University, Stillwater, Oklahoma 74078 Purpose: To provide a 3-dimensional spatial prior to the image reconstruction of trans-rectal optical tomography for prostate cancer detection. Approach: 2-dimensional segmentation of the axial TRUS images are performed extensively, however, 2-dimensional segmentation of the sagittal TRUS images are challenging, due to more complexities in contrast, morphological features and image artifacts, as well as significant inter-subject variations of the prostate shape and size. We develop a routine of segmenting 2-dimensional TRUS images obtained from canine prostate, based on the combination of a Snakes algorithm and selected manual segmentation. Result: The segmentations obtained from a sparse set of axial and sagittal images are aligned to form the 3-dimensional contour of a prostate. The resulted prostate profile is implemented as the spatial prior to constrain image reconstruction of trans-rectal optical tomography. The trans-rectal optical tomography images reconstructed with the prostate profile prior are compared with those reconstructed without any spatial prior.

05.08.25 Mechanical Effectiveness of Polyvinyl Alcohol/Polyvinyl Pyrrolidone (PVA/PVP) as an Intervertebral Disc Polymer

Khiet Tran, Ashton Williams, Kooroush Azartash-Namin, Morshed Khandaker, Zheila Azartash-Namin,

University of Central Oklahoma

The intervertebral disc (IVD) provides support and enables six degree of freedom motions (6DOF): flexion, extension, right/left lateral bending, compression, and axial rotation. When individuals suffer from degenerative disc, the nucleus pulposus (NP) deteriorates, causing loss of articulation in the IVD. However, replacements for the NP can be used. The objective of this study was to evaluate the mechanical performances of a potential NP replacement consisting of polyvinyl alcohol/polyvinyl pyrrolidone (PVA/PVP) polymer. The hydrogel was synthesized by physically cross-linking with 95%-weight PVA and 5%-weight PVP. Using a dynamic rheometer, elastic (G') and viscous (G'') moduli of the hydrogel can be determined by calculating the complex shear modulus (G*) under low-frequency oscillating shear deformation. A slider-crank mechanism was assembled with a Universal Mechanical Testing System to evaluate the mechanical effectiveness of the hydrogel in a bovine spine (BS) under physiological 6DOF motions. The experimental setup consists of displacement sensor, plate force sensor, and a 6-axis force/moment sensor. The G' of the hydrogel was tested at parameters 5%, 10%, and 15% (228.6 Pa, 988.8 Pa, and 1793 Pa). The G' for the natural bovine specimen at 5%, 10%, and 15% (712.9 Pa, 522.1 Pa, and 363.3 Pa). Position, velocity, acceleration, and force of the experimental model at 6DOF motions were verified using a dynamic simulation model.

05.08.26 Application of a geometric-sensitivity-difference based reconstruction method to improve object depth-localization for fluorescence diffuse optical tomography in a circular outward imaging geometry
Krishna Teja Tokala, Daqing Piao,  

*Oklahoma State University*

Purpose: To improve object depth-localization for fluorescence diffuse optical tomography (FDOT) in a circular-array outward-imaging geometry that is subjected to strong sensitivity variation with respect to imaging depth. Approach: We demonstrate FDOT image reconstruction based on geometric-sensitivity-difference (GSD) method that optimizes the data-model fit based on the paired measurements corresponding to two pairs of source-detector that share either the source or the detector, in comparison to the conventional method that optimizes the data-model fit based on the unpaired measurements corresponding to individual pairs of source-detector. The FDOT image reconstruction based on GSD-scheme applied to same-source source-detector pairs is demonstrated using simulated continuous-wave measurements in a circular-array outward-imaging geometry, of which the native sensitivity varies strongly with respect to the depth. The outcomes of GSD-based image reconstruction are compared to those of the conventional baseline method that utilizes the native sensitivity and does not involve depth-compensating scheme. Result: This alternative approach effectively reduces the variation of the reconstruction sensitivity, comparing to the reconstruction based on the native sensitivity of measurement. Conclusion: The GSD method improves the depth localization taking advantage of the source-detector pairing for the fluorescence reconstruction of the anomalies.

05.08.27 Design of an Optical Tweezers Force Calibration Procedure  

Niralee Raichura, Baha Jassemnejad, Erdoo Segher, Gang Xu, Jophine Abraham,  

*University of Central Oklahoma*

Optical Tweezers (OT) — which use tightly focused laser beams to trap and manipulate microscopic dielectric particles, tissue cells, and cellular organisms — have proven valuable in areas such as cell biology, biophysics, and materials science. A microsphere trapped in the OT can function as a soft mechanical spring to apply forces on the order of pico-Newton (10^{-12} N). The goal of this study is to design and develop the force calibration procedure for the OT in our department. First, we developed a numerical model to simulate the calibration of our OT system. For the simulation, the trapped microsphere is modeled as a sphere attached to a spring. The thermal fluctuations of a microsphere are mimicked by applying small random forces on the microsphere. We have developed MATLAB codes for this simulation to estimate the spring constant based on the similar fluctuations, and to confirm the tracking program that will be used for tracing the microsphere's positions in real experiment which are needed for the calibration of our OT system. The calibration of our OT system would be useful in the future cellular and molecular bio-mechanical studies.
05.08.28 Physical Properties of an Electro Active Polymer

Zheila Azartash-Namin, Morshed Khandaker,

University of Central Oklahoma

Electro active polymers (EAP) are a grouping of materials which undergo deformation when stimulated by electrical energy. Soft dielectric EAP consists of a deformable dielectric between two electrodes behaving as a compliant capacitor. The working principle of soft dielectric EAPs states that when activated, the electrodes of the capacitor will charge to opposite polarities generating a stress induced by coulombic forces in which the electrodes attract and move closer together. Using this principle, a linear actuator can replicate skeletal muscle behavior for use in prosthetic applications. The objective of this project is to (1) prepare a soft dielectric EAP made with poly(vinyl) alcohol (PVA) and polyvinyl pyrrolidone (PVP) and (2) to examine the physical properties of the specimen using an experimental setup. The hydrogel was synthesized by physically cross-linking PVA and PVP in a 95%:5% ratio, respectively. Malvern CVO rheometer was used to perform viscoelastic tests obtaining values of 0.9818 Pas, 2.793 Pas, and 3.02 Pas for initial, second and sixth freeze/thaw cycles. This data showed a trend of increasing viscosities after each freeze/thaw cycle. The elastic (G') and viscous (G'') moduli of the PVA/PVP hydrogel were determined by calculating the complex shear modulus (G*) under low-frequency oscillating shear deformation. The G' of the hydrogel was tested at parameters 5%, 10%, and 15% strain with results of 228.6 Pa, 988.8 Pa, and 1793 Pa, respectively.

05.08.29 Characterizing Fuel Use Rates of Heavy-Duty Diesel Equipment: A Case Study for Wheel Loaders

Heni Fitriani, Phil Lewis,

Oklahoma State University

Heavy duty diesel construction equipment consumes large quantities of fuel and subsequently emits significant quantities of air pollutants. This poster presents a methodology for characterizing fuel use rates of construction equipment in order to better estimate air pollution emission rates and is based on real-world data collected from the equipment as it performed construction activities in the field. This study examined five wheel loaders by estimating the weighted-average fuel use rate via an engine load modal analysis. For each wheel loader, the engine load data was classified into 10 modes, ranging from the minimum to the maximum engine load, and an average fuel use rate was determined for each mode. The overall weighted-average fuel use rate was determined by multiplying the modal average fuel use rate by the percentage of time spent in that particular engine mode and then summing the results for each of the 10 modes. Monte Carlo simulation was used to model the distributions of the weighted-average fuel use rate for each wheel loader by randomly selecting values (within specified ranges) for the percentage of time spent in each engine mode and the modal average fuel use rate. Preliminary results indicate that there is inter-vehicle variability in the weighted-average fuel use rates of the five wheel loaders. A sensitivity analysis was also performed in order to determine which variables have the greatest impact on the weighted-average fuel use rate.
05.08.30  Effects of Glycated Chitosan on Interstitial Laser Immunotherapy for the Treatment of Metastatic Cancer

Cody Bahavar, Allie Sikes, Ellen Boarman, Jessica Goddar, Robert Nordquist, Wei Chen,

University of Central Oklahoma

Metastatic cancer is the number one cause of cancer death. Interstitial laser immunotherapy (ILIT) is an innovative treatment used to treat metastatic cancer. ILIT combines both immunotherapy and phototherapy to create a long-term tumor suppression in the host’s immune system. An infrared laser with cylindrical diffusion is used to irradiate tumors and cause the release of tumor antigens. ILIT can induce a tumor-specific immunity in the body. Although ILIT is still being developed, its results in clinical trials have shown to be very beneficial for late-stage breast cancer and melanoma patients. Glycated chitosan (GC) is the immunological stimulant used for ILIT. Having an optimal dosage of GC is critical for maximizing the effects of our treatment. We have performed animal studies to test which dosage of GC is optimal. The results suggested that the optimal dose of glycated chitosan is in the range of 0.1 to 0.3 ml per rat tumor.

05.08.31  Automated Speaker Recognition System Based on Spectral and Temporal Analyses of the Speech

Cedric Tinang, Aaron Langston, Mohamed Bingabr, Tommy Le, Trison Graham,

University of Central Oklahoma

Automated Speaker Recognition (ASR) is the ability of a machine to accurately recognize a speaker by comparing his/her voice to a voice stored in its memory. Human voice is unique and can be classified by a voice biometric (VB) that is based on the anatomy of the speaker's glottis, nasal cavity, oral cavity, teeth, tongue, and throat constriction. The objective of this research and project is to develop ASR system that extracts the VB from a preset password, uttered by a speaker, and compares it to a VB stored in the system, only granting access if the two voice biometrics match. The voice password was chosen to insure the use of all anatomical parts of the human speech production system, so the extracted VB will be reliable for speaker recognition. The proposed ASR system consists of several subsystems that use different signal processing techniques to extract different parameters of the VB. The subsystems filter out any noise in the speech signal, segment the uttered sentence into words, run a cross correlation in the time and frequency domains to compare articulation and speaking style of the words, extract vowels to compare formants of the vowels, extract the pitch of the speaker, extract the consonant “m” to compare the anatomy of the nasal cavity, and finally perform statistical analysis to determine a match or mismatch between the voice biometrics, based on weighted factors of each test. Seventy percent of the subsystems have been developed and tested successfully.
05.08.32  Design, Construction, and Launch of Near Space Balloon

Blice Nuchka Okome M'bika, Ahmed Alshbaan, Jerry Haubrick, Pankaj Karna,

University of Central Oklahoma

The senior engineering project is to design and construct a research platform capable of conducting scientific measurements at very high altitudes. A 1500 g meteorological balloon will lift a 10 lbs payload until the balloon bursts, and then a 9 ft recovery chute deploys and delivers the package to the surface. The minimum intended ceiling for the experiment will be approximately 60,000 ft. The capsule will contain a video camera, to record the balloon's journey for the duration of the flight. The research platform will measure cosmic ray levels, barometric pressure, relative humidity, temperature, and magnetic field intensity as functions of altitude during the flight. To conduct and data log the experiments, we have designed an on board flight computer utilizing the BASIC Stamp microcontroller. The flight computer will also transmit telemetry data to the research team live, via long range radio modems, so that the payload can be tracked to its landing site. The data obtained for magnetic field will be compared to simulated data. The findings will help understanding of 3 dimensional aspects of magnetic field intensity from the ground to the upper atmosphere. We used Solidworks to design the capsule and decided to use an insulated polyurethane case to keep the electronics at a safe temperature inside the capsule.

05.08.33  Anti-Tumor Immunity Induced by Combination of Glycated Chitosan and High Intensity Focused Ultrasound

Wei Chen,

University of Central Oklahoma

High intensity focused ultrasound (HIFU) has been used for cancer treatment using its selective photothermal destruction of target tumor. In this study, a HIFU system was used to treat animal tumors with an immunological stimulation through application of a novel immunoadjuvant, glycated chitosan (GC). We stably transduced multimodality molecular imaging probes, including mRFP, firefly luciferase and herpes simplex virus 1 thymidine kinase (HSV1-tk) into murine 4T1 breast cancer cell line. The growth and metastatic tumor cells were detected using the IVIS system and microSPECT/CT system for fluorescence imaging and radionuclide-based imaging. We found that GC has a potential to reduce cell migration in vitro by decreasing the Twist1 expression. We also treated the 4T1-bearing mice using GC, HIFU and HIFU-GC. The results showed that tumor metastasis was apparently suppressed by a combined treatment using HIFU and GC, but not in HIFU or GC alone. Histology two weeks after treatment showed accumulation of macrophages in treated tumors. We also found that plasma collected from mice treated with HIFU-GC could significantly suppress the viability of cultured cells compared to untreated or single treated group. In summary, these results suggest that the HIFU therapy combined with GC can enhance the tumor immunogenicity and tumor control.
05.08.34  Nitric Oxide Production in Macrophages Induced by Tumor Cells After High-Fluence Low Power Laser Irradiation

Wei Chen,

University of Central Oklahoma

High-fluence low-power laser irradiation (HF-LPLI) provides simulation to cell death. It is well known that dead cells or dying cells provide antigens to trigger recognition of the specific cells by the immune system. In order to determine the effect of HF-LPLI on antigen-presenting cells, we investigated the effect of HF-LPLI treated tumor cells on macrophages phagocytosis and nitric oxide (NO) production. Our results showed that HF-LPLI induced EMT6 tumor cell death. We also observed that HF-LPLI treated EMT6 tumor cells could be phagocytosed by macrophage cells and could induce NO production in macrophages. Our study shows that HF-LPLI-treated tumor cells can effectively regulate immune system and HF-LPLI can be used for tumor treatment.

05.08.35  Laser Immunotherapy in the Treatment of Late-Stage, Metastatic Melanoma Patients

Wei Chen,

University of Central Oklahoma

Melanoma is a deadly skin cancer. While it only accounts for about 4% of all skin cancer occurrences, it causes more than 70% skin cancer related deaths. Melanoma is closely related to the host immune system. Therefore, immunotherapy is arguably the most effective way of treating advanced melanoma. The ideal immunotherapy methods should not only effectively eradicate the local tumors, but also control and eliminate the metastatic tumors at distant sites. A special immunotherapy was developed for treating advanced (stage III/IV) melanoma and other solid tumors, using a combination of laser irradiation and application of immunoadjuvant, glycated chitosan, both locally. This new method, called laser immunotherapy, involves in situ treatments of tumor deposits to enhance local immunity and concomitantly, system-wide anti-tumor responses. This treatment paradigm is likely the basis for the abscopal effect observed following laser immunotherapy. One specific approach in laser immunotherapy is percutaneous insertion of laser fibers that can be used to reach any location in the body. Recent case reports demonstrate the step-wise development of this technology for the purpose of demonstrating for the first time, its practical application. Other immunotherapeutic agents such as anti-CTLA4 antibodies can also be used to multiply and enhance these local immune responses induced by laser immunotherapy, to provide more potent system-wide immunological anti-tumor effects that translat
05.08.36 Developing Autonomous Solutions for Hazardous Environments

Allen Goekler,

University of Tulsa

The purpose of this project was to develop a solution to visual inspection and monitoring in remote environments. Some areas of the world are too remote or treacherous to access with conventional methods, in other cases, it is too hazardous. Using standard hobby planes and off-the-shelf electronics, we aimed to provide a small easy to use, long range unmanned aerial vehicle (UAV). This vehicle would be simple enough that anyone could learn the system in an hour, some faster. This system would also have to be self-reliant, in that if something were to happen with a radio signal, it would default to a failsafe and find its way home. Rather than use the tried and true approach for hobbyist UAVs, which utilized three radios of different frequencies for control, telemetry, and video; we aimed to develop a system that relied on only one Ethernet radio to stream both video and flight data back to the user. With this in mind, we were able to develop a vehicle that once in the air; we were able to stream video, read flight data, and control the device on a single radio frequency.

05.08.37 Energy Losses in Microjunction Chains

Ane Muvadgah, Evan Lemley, Phd,

University of Central Oklahoma

The purpose of this project is to measure the energy losses (EL) in microjunction chains (MJCs). Three dimensional MJCs will be using computer-aid drafting (CAD) software, and several simulation runs will be carried out with computational fluid dynamic (CFD) software to allow for the investigation of energy losses as a function of interconnection length, angle between exit branches for each duct, and number of branches.

05.08.38 Photothermal Effects of Glycated Chitosan Bound to Single-Walled Carbon Nanotubes

Brock Henderson, Jessica Goddard, Joseph Aquaviva, Ryan Griswold, Wei Chen,

University of Central Oklahoma

Phototherapy has been used in many biomedical applications to combat tumor cells. Recently, carbon nanotubes have been used extensively in biomedical research. Specifically, single-walled carbon nanotubes (SWNTs) possess an enhanced light absorption at 980nm. Glycated chitosan (GC) is a potent immunoadjuvant as well as an effective surfactant. The combination of SWNT and GC is a novel approach to increase selective photothermal response in tumor cells. We combined GC and SWNT to construct a SWNT-GC suspension. The SWNT-GC retains the enhanced absorbency properties of SWNT while allowing selective thermal destruction. This experiment was conducted to observe the advantages of two different immunoadjuvants, GC and polyethylene glycol (PEG), compared to water. Tumor cells showed the largest increase in heat shock proteins secretion when combined with SWNT-GC. Keywords: Single-walled carbon nanotubes, immunomodifier, selective light absorption, treatment of cancer, near-infrared light.
**05.08.39  Design and Implementation of a Partical Image Velocimetry System for Fluid Dynamics.**

Sultan Almaglooth, Andrew Henderson, Ane Muvadgah, Evan Lemley, Phd, Yunhao Lin,

*University of Central Oklahoma*

This project is supported by the Department of Engineering and Physics at University of Central Oklahoma. The main goal of this project is to produce and design a functional Particle Image Velocimetry (PIV) experimental apparatus with a lower cost compared to commercial apparatus and sufficient performance. This apparatus will be able to determine the fluid velocity profile which is flowing in a test section that consists of milli-sized junction to measure the pressure drop across the test section, and to find loss coefficient as a function of Reynolds number using entropy generation concepts. The apparatus consists of six main components which are a camera, laser, cylindrical lens, laser lifting system, test section, PIV Lab software, and fluid driving system. The results of this project will yield four deliverables. First, PIV system for less than $1000. Second, two T-junctions with round and sharp edges to be used in experiments. Third, a system that will drive fluid through the test section at variable Reynold’s numbers with steady flow. Finally, a report detailing experimental data and entropy generation calculations, that compares the experimental results with simulated results.

**05.08.40  Effects of Micro Fibers on the Fracture Strength of Implant-Cement Interfaces**

Aayush Khadka, Morshed Khandaker, Sandip Banstola, Utsaha KC,

*University of Central Oklahoma*

The interfacial mechanics at the implant-cement interfaces is a critical issue for implants fixation and the filling of tissue defects created by disease. Electrospinning is a process by which fibers with micron or nano diameters can be obtained from an electrostatically driven jet of polymer solution. The present study is based on the hypothesis that the differences of the surface properties at aluminum (Al)/cement interface due to incorporation of micron fiber may have significant influence on the quality of Al/cement union. The objectives of this study are to design and construct electrospinning unit for the fabrication of Polycaprolactone (PCL) fiber and to measure the interface fracture strengths of sandwiched Al/cement samples with unidirectional, bidirectional and random micron fibers at the interface under tension, mixed and shear forces. PCL beads were dissolved in acetone with concentrations varying from 5-15 wt.% using sonicator. The random distributed fibers were collected on carbon tape in the stationary XY. Scanning electron microscope (SEM) was used for viewing the fibers. Tension tests were conducted on Al/cement sandwiched specimen. The interface fracture strength of sandwiched samples was measured. Our preliminary study found that the values of KIC of Al/PMMA with fiber were higher when compared to the values of KIC of Al/PMMA without fiber under tension force. Results indicated that the addition of the fiber to Al improved the quality of Al/cement union.
Discovering Amplitude Quantization as an Elementary Property of Macroscopic Vibrating Systems through Doubochinski’s Pendulum

Jason Yeisley, Andrew McFarlin, Chris Conley, Chris Stewart,

*University of Central Oklahoma*

A new class of vibratory processes known as “argumental oscillations” was established in the late 1960s. This was originally discovered by Danil Doubochinski, who noticed the occurrence of amplitude quantization in certain macroscopic oscillating systems. He was able to use these findings as a kind of “bridge” between classical and quantum physics. In our project, we are recreating one of Doubochinski’s experiments to further extend the knowledge of these quantized amplitudes and to gather new data. This pendulum uses the standard pendulum’s frame with a fixed arm and oscillates in a fixed plane. In contrast with a standard pendulum, Doubochinski’s pendulum has a permanent magnet as the pendulum bob and will interact with a magnetic field. The magnetic field in which the pendulum bob passes through is created by a solenoid placed directly under the pendulum bob. The solenoid is constructed by wrapping copper wire around an iron core and then connecting this device to an AC voltage source to produce an electromagnetic field. There are two main experiments that will be done when observing this pendulum; first, we will observe any effect the pendulum will experience if the length of the pendulum arm is changed. Next, we will adjust the frequency from our power source at these different arm lengths from a range of 10 Hz to 200 Hz. By performing these experiments, we can examine the effects these changes have on the quantized amplitudes.

Exothermic Temperature Measurements of Novel PMMA Bone Cements

Morshed Khandaker, Zhaotong Meng,

*University of Central Oklahoma*

Poly Methyl Methacrylate (PMMA) bone cement produce exothermic reaction during its polymerization process, which damage the surrounding bone tissue. Nanoparticles additives can be incorporated with the PMMA cement to reduce the exothermic reaction. The objectives of this project are to determine change of temperature during curing process of PMMA with different types and concentrations of nanoparticles. PMMA beads were added with 2wt%, 6wt%, and 10wt% of nanoparticles (MgO, BaSO4, hydroxyapatite (HAp), SiO2, chitosan, chitin). The mixer was dissolved in benzoyl peroxide monomer using 2:1 solid: liquid ratio. PMMA cements were poured on ½ in. diameter and ¾ in height mold in an acrylic plate. A custom made temperature measurement system was used to determine the temperature changes of the different PMMA cements in the mold. The system consists of 4-channel thermocouple (InstruNet Inc.), data acquisition device, data acquisition software and laptop. This study found the curing time increased and the exothermic temperature slightly decreased, while the concentration of the nanoparticles increased. As concentration of the nanoparticle increased to 10wt%, some sample with certain nanoparticles needed more time to solidify. SiO2 took about 30mins to cure with 10wt%. MgO and chitosan have lower temperature changes. More data of samples with different concentration are currently being collected to get a better comparison of exothermic temperature created by different nanopar
Loss Coefficient Calculation Using Entropy Generation with an Inexpensive Particle Image Velocimetry System

Brock Ring, Andrew Henderson, Daniel Atkinson, Evan Lemley, Phd,
University of Central Oklahoma

An essential concept in fluid dynamics is the energy losses of a fluid as it flows through junctions or bends. These losses can be generalized for junction geometries and used to drastically simplify calculations. The objective of this research was to determine if an inexpensive Particle Image Velocimetry (PIV) system could be used to calculate the loss coefficient in a test section using the entropy generation of a fluid. This was done by performing PIV analysis on a steady state, laminar, fully developed flow through a straight tube. This type of flow allows the calculations to easily be checked by pressure measurements up and down the stream. A computer code was then written to analyze the flow profile and perform the necessary calculations. Our findings showed that the loss coefficient from the entropy generation code could be calculated to within 3%-10% difference of the calculations made by taking pressure measurements.

Loss Coefficient Determination of an Acrylic Bifurcation.

Andrew Henderson, Aric Gillispie, Brock Ring,
University of Central Oklahoma

This proposed research is a part of a cooperative project in coordination with Dr. Herwig and Dr. Schmandt of the Hamburg University of Technology. Our research group consisting of myself and Dr. Evan Lemley of the University of Central Oklahoma are tasked with designing, setting-up, and performing experiments on the proposed bifurcation or y-junction. A bifurcation/junction is a division of flow. Dr. Herwig and Dr. Schmandt have conducted Computational Fluid Dynamic (CFD) simulations of the proposed bifurcation. The proposed Y-junction has been designed using 3D Computer Aided Design (CAD) software SolidWorks. The inlet and outlet diameters are 3.175mm and the angle between the outlets will be [45]^0. The Y-junction will be fabricated out of acrylic using the university's in-house Roland milling machine. Pressure drop and volume flow rate data will be collected and used to determine the loss coefficient as a function of Reynolds number for the proposed Y-junction. Finally, the experimental results will be Validated and Verified (V&V) to that of the planned simulated results.

Design, Simulation, Fabrication, and Experimental Analysis of a Double Pipe Heat Exchanger

Lince Rumainum, Abdellah Ait Moussa, Jan Ronard Pinpin, Mohammed Almomen,
University of Central Oklahoma

The design of heat-transfer equipment involves a trade-off between the two conflicting goals of low capital cost (high overall heat-transfer coefficient, small heat-transfer area) and low operating cost (small stream pressure drops). Optimal designs thus involve the constraints of capital and energy costs, which are constantly changing. In this project, we develop a computer interface similar to commercial computer software packages used for heat exchanger design, the underlying computer program calculates and optimize the size of heat exchangers within the constraints of capital and energy costs; particular emphasis is on the design of a double pipe heat exchanger. Heat transfer simulation using ANSYS Fluent, in addition to engineering experimentation were also conducted to confirm the efficiency and reliability of the proposed designs.
05.08.46  Mechanism of Laser Immunotherapy in Treatment of Late-Stage, Metastatic Breast Cancer Patients

Wei Chen,

*University of Central Oklahoma*

Laser immunotherapy (LIT) is a local intervention for late-stage, metastatic cancers. It combines tumor irradiation by a near-infrared laser light and immunological stimulation by a novel immunomodifier. In the past 18 years, LIT has been developed from a simple concept to clinical trials with promising pre-clinical and preliminary clinical results. The hypothesized mechanism of LIT is the activation of dendritic cells (DCs), enhancement of uptake and the presentation of antigens, and activation of a tumor-specific T-cell response. Specifically, two overseas (Peru and the Bahamas) clinical studies using LIT were conducted. We have followed the treated patients during the past several years. Here we report the survival data of the treated patients. We also report the development of tumors after LIT treatment using different imaging modalities, such as CT, PET-CT, and MRI. A number of no-option patients have had complete responses after LIT. In a number of patients, the distant metastases, such as in the lungs, have been reported shrinking or disappearing. Overall, the preliminary results of LIT in our clinical trials are promising. We also report the results of our studies in support of the hypothesized mechanism of LIT.

05.08.47  Optimization of Diesel Oxidation Catalyst and Diesel Particulate Filter System

Matt Coffman,

*University of Tulsa*

Combustion engine exhaust gases are one of the largest sources of pollutants in the United States. Emissions standards are aimed at limiting the quantity of harmful pollutants contained in exhaust gas from stationary, mobile, and area sources. Criteria levels for exhaust are consistently made more stringent every several years at both the state and federal level, meaning emissions solutions companies need to adapt quickly to meet the ever changing demand. Diesel oxidation catalysts (DOC) and diesel particulate filters (DPF) were tested on a 150 kW engine to improve the exhaust chemistry of compounds emitted to the atmosphere. It was hypothesized that a more economical DOC-DPF system could be optimized to yield less than a 20% increase in oxides of nitrogen and maintain the ability to actively burn off particulate matter below 250 °C. Various DOC-DPF combinations were tested, sequentially varying several parameters like precious metal ratios, wash coat loading, cell density, DPF coating, and space velocity. This batch of testing did not yield a more cost-efficient DOC-DPF system than those currently used in the commercial industry; however, it did produce results helpful for understanding the interplay in these dynamic process reactors.
Photoacoustic Imaging in Determination of Tissue Temperature During Laser Irradiation

Wei Chen,

University of Central Oklahoma

Temperature increase can be used for tumor treatment since acidic condition of tumor tissue is more sensitive to heat. Determination of tissue temperature is crucial in destroying target tumor cells and in sparing normal surrounding tissue. Photoacoustic imaging has become a non-invasive tool for clinical diagnosis. In this study, we develop a system using the photoacoustic system to monitor the temperature increase during photothermal therapy, which was carried out by utilizing a continuous wave laser and photoabsorber-enhanced black ink with a absorption peak in the near-infrared optical range. A focusing photoacoustic imaging is interfaced with a nanosecond pulsed laser to image tissue-mimicking phantoms before and after irradiation by a near-infrared laser light. The results demonstrated that changes in the photoacoustic signals could reflect temperature changes in tissue. More importantly, photoacoustic signal could be used to determine the temperature at the boundary of photoabsorber-enhanced tissue during photothermal irradiation. Photoacoustic imaging method can be potentially used to guide photoabsorber-enhanced photothermal therapy.

A Method for Obtaining a Particle Image Velocimetry

Aric Gillispie, Evan Lemley, Phd,

University of Central Oklahoma

To better understand what happens to fluids in microchannels, it would be very useful to be able to visualize the fluids direction and its speed, or its velocity vector. Through simulations and calculations, pressure loss and flow rate can be determined, but to actually see what is happening would give clarification to what is happening throughout a field of view. The method we used to do this was particle image velocimetry or PIV. This allows vectors to be obtained based on the speed and direction of a fluid at a particular point. This was done through the use of neutrally buoyant particles in the fluid of a channel, and a high-powered laser with a diffraction grating lens that reflects off the particles allowing them to be tracked with a high frame rate camera. The laser itself was mounted to a platform that can be adjusted in very small increments to insure the laser sheet is passing through the precise location containing the neutrally buoyant particles. Once captured, the images were put into software called PIVlab where the particles were tracked from frame to frame, and the velocity vectors developed and displayed throughout a chosen field of view. The vectors could be measured to determine the rate the fluid was moving in different places, and whether or not vortices were forming, causing pressure loss. We obtained results showing precisely how the fluid was moving in a given location with the use of a particle image velocimetry system for fluid dynamics research.
**05.08.50** Synthesis and Optical Properties of pH-Responsive Novel Conjugated Polyampholytes

Wei Chen, Okhil Nag,

*University of Central Oklahoma*

A novel conjugated polyampholyte, PQA-BT, was designed and synthesized by incorporating blue (fluorene-phenylene) and green (benzothiazole, BT) emission moieties on the main backbone, and cationic as well as anionic charge groups on the side chains. PQA-BTs are soluble in water and showed pH dependent optical properties. BT emission of the polymers increased with increasing the pH of the solution, which is due to intra/inter-chain aggregation via deprotonation and electrostatic complexation between cationic quaternary ammonium ion and anionic carboxylate ion. With increasing pH aggregation induced fluorescence (PL) emission efficiency of BT increases. FRET ratio between green and blue emission shows linear relationship with the pH.

**05.08.51** Exothermic Temperature Measurements of Novel PMMA Bone Cements

Zhaotong Meng,

*University of Central Oklahoma*

Poly Methyl Methacrylate (PMMA) bone cement produce exothermic reaction during its polymerization process, which damage the surrounding bone tissue. Nanoparticles additives can be incorporated with the PMMA cement to reduce the exothermic reaction. The objectives of this project are to determine change of temperature during curing process of PMMA with different types and concentrations of nanoparticles. PMMA beads were added with 2wt%, 6wt%, and 10wt% of nanoparticles (MgO, BaSO4, hydroxyapatite (HAp), SiO2, chitosan, chitin). The mixer was dissolved in benzoyl peroxide monomer using 2:1 solid: liquid ratio. PMMA cements were poured on ½ in. diameter and ¾ in height mold in an acrylic plate. A custom made temperature measurement system was used to determine the temperature changes of the different PMMA cements in the mold. The system consists of 4-channel thermocouple (InstruNet Inc.), data acquisition device, data acquisition software and laptop. This study found the curing time increased and the exothermic temperature slightly decreased, while the concentration of the nanoparticles increased. As concentration of the nanoparticle increased to 10wt%, some sample with certain nanoparticles needed more time to solidify. SiO2 took about 30mins to cure with 10wt%. MgO and chitosan have lower temperature changes. More data of samples with different concentration are currently being collected to get a better comparison of exothermic temperature created by different nanopar
Data Acquisition for Laminar Fluid Systems

Daniel Atkinson,

University of Central Oklahoma

The goal of this research is to more efficiently take in data pertaining to laminar fluid flow in a junction and/or channel by upgrading the currently used hardware as well as modifying the current software and creating new software. Current research in the lab uses pressure losses and fluid flow rates to calculate loss coefficients for the junction. This system uses a number of analog sensors interfaced with a microcontroller which is then interfaced with a computer for data acquisition. My research will upgrade the microcontroller to more efficiently pass data to the computer. On the software side of my research, I will be implementing a new acquisition program that will be more robust than the current supporting features such as taking in information about the fluid running through the junction to be used by the program for calculations. This will make running a broader spectrum of fluids through our experimental systems more efficient and more accurate. To complete these tasks I will be implementing a modular approach first implementing new hardware which is still compatible with the old software then adapting current programs for implementation in the redesigned data acquisition program.

Design of a Temperature Measurement and Acquisition Device to be Used in Conjunction with Laser Photothermal Therapy

Lance Straughn, Amanda Walker, Shayla Pearson, Wei Chen,

University of Central Oklahoma

Thermal therapy, with appropriate elevation of temperature in target tissue, can be a potential method for cancer treatment. Elevating and maintaining tissue temperature at a desired level during laser irradiation is crucial for the effectiveness of thermal therapy. Dr. Wei Chen, the leader of a research group who has developed laser immunotherapy for the treatment of cancer, has expressed a need for a temperature measurement device that is less costly and more mobile than his current equipment. Our project is aimed at designing a cost effective, portable, and highly precise temperature measurement device to be used in conjunction with laser photothermal therapy. The device currently provides a digital display of temperature readings from multiple sensor inputs and records these values into memory. The device will provide a notification to the user, indicating that the target tissue has reached a critical temperature that has been specified by the user. In future applications of our device, an automatic control of the laser to maintain a specified temperature of the target tissue will be developed based on the trigger of the notification. Our design provides an accurate temperature measurement device that is easily transported and at a fraction of the cost of current equipment.
05.09.01 Effects of Climate Change on Biomass Allocation to Leaves and Specific Leaf Area Along an Elevation Gradient

Alexander Hardison, Evailaufaumalu Sala, Fern Lehman, Jacqueline Mohan, Shafkat Khan,

Oklahoma State University

Tropical forests are globally important for biodiversity and ecosystem functions that affect global climate via carbon and water balances. However, we lack experimental understanding of how climate change will affect tropical forests. I studied two common tropical rainforest tree species in 17 common garden plots along an elevational gradient (6 high, 6 mid, 5 low; at 1350m, 1050m and 650m respectively), where conspecific individuals were planted downslope to mimic future changes in climate at the native elevation. I quantified leaf biomass by counting the number of leaves in each tree and taking leaf samples to determine individual leaf mass. Our results suggest that biomass allocation to leaves sensitive to climate change is species and population specific. Also, specific leaf area is affected by climate change differently across species, and for some species is related to both environmental and genotypic factors. As leaves are directly related to tree development and productivity, and also closely linked with primary production and consequently, carbon sequestration, this study helps shed important insight into how individuals within and across species respond to climate change in that specific leaf area will change, but leaf biomass is not affected.
**05.09.02** Investigation of Indigenous Actinomycetes as Chlordane Remediation Agents

Paul Olson, BrieAunna Webster, Felicia Osburn, James Green, Jocelyn Bidlack,

*University of Central Oklahoma*

Actinomycetes bacteria are promising remediation agents capable of dechlorination and degradation of many organochlorine pesticide contaminants. In this study, Actinomycetes strains were isolated from soil samples collected from a chlordane-contaminated site. Fifty-four strains were identified by morphological and biochemical characteristics referenced in Bergey's Manual. A tolerance assay was conducted to identify strains exhibiting normal growth in the presence of high concentrations of the toxic chlordane compound. Twelve actinomycetes strains were identified as tolerant, candidate remediation agents. The candidate strains were subjected to a mixture of a-chlordane and g-chlordane in solution to evaluate the strains’ capacity to degrade the isomeric compounds either as a sole carbon source or by co-metabolism with lignin as the primary carbon source. Metabolic residues are currently being analyzed by gas chromatography mass spectrometry to determine the extent of chlordane degradation and the identity of the metabolic degradation products. The goal of the research is to provide needed information toward a cost-effective remedial approach to persistent contaminants in the environment.

**05.09.03** Paleontological Survey of Ordovician West Spring Creek Formation, Arbuckle Group, Kiowa County, OK

Brian Campbell, Zella Classen,

*Southwestern Oklahoma State University*

Oklahoma has a varied geological and paleontological history. There is still much to learn from the geologic exposures in this state. Numerous studies have been done with Mesozoic and Cenozoic paleontology and sedimentary geology, but many Paleozoic exposures have only cursory published studies, with most of these exposures having not been revisited for decades. We initiated a general paleobiological survey of the West Spring Creek formation (Ows), Arbuckle Group from the Ordovician Period, early Paleozoic Era. These exposures are dating from 443.7 – 488.3 Ma (+/- 1.5) and have little or no published research. This study employed a SWOSU student with an interest in invertebrate paleontology to assist with the cleaning of samples and identification of fauna. Several unpublished organisms and undescribed features from the Ows formation were identified. Identified organisms include: crinoids, brachiopods, gastropods, straight and coiled cephalopods. Identified mineral features include: pyrite crystals, limey sandstone, and chert nodules. We had anticipated finding pelecypods; unfortunately none were to be identified.
05.09.04 Statistical Count of Invertebrata from Ordovician West Spring Creek Formation, Arbuckle Group, Kiowa County, OK

Brian Campbell, Zella Classen,

Southwestern Oklahoma State University

Several Ordovician (early Paleozoic) exposures dating from 443.7 – 488.3 Ma (+/- 1.5) with little or no published research were identified south of Mountain View, Oklahoma on hiway 115. This study surveyed the West Spring Creek formation (Ows) of the Arbuckle Group and performed an invertebrate identification and count, and environment interpretation. Twenty rock samples from this exposure were cleaned, cut, and analyzed for invertebrate fossils. Organisms including: brachiopods, cephalopods, foraminifera, gastropods, and crinoids were identified. Finding crinoid ossicles in the abundance we did was surprising, as little reference to them has been documented in the Ows. Trace fossils in the form of borrows, though uncommon, were identified in a few samples. Also surprising was the discovery of small pyrite crystals, fine limey sandstone, and chert nodules. Of the identified fossils, brachiopods and gastropods were the most common. From the fossils and matrix, we concluded the Ows was a shallow, warm marine environment, relatively high energy, with a limey mud substrate. Life was common, but not abundant. Many fossils found in the rocks likely lived in the area, but not the exact location they were found as signs of transport were evident. There were some indications of predation. In short, a limited, yet complex shallow photic marine ecosystem is indicated having existed between 444 and 488 Million years ago, just south of present day Mountain View, Oklahoma.

05.09.05 Understanding the Keystone XL Pipe Line: It's impact on the Environment and Economy

Mathew Baldwin, Dr. A.K. Fazlur Rahman,

Oklahoma School of Science and Mathematics

The Keystone XL Pipeline project is currently seeking a presidential building permit and if passed will begin in construction in early 2013 and be completed in 2014-2015. The proposed route is 3,456 Km running from Hardesty, Alberta to Port Arthur, Texas. This pipeline is important to Oklahoma as it runs through Oklahoma with a major distribution point at Cushing, Oklahoma. The cost for building the US portion of the pipeline is 7 billion. Part of this will go to the state of Oklahoma as Oklahoma will house 9 of 39 pumping stations as well as the distribution point at Cushing. Economically this will provide approximately 4,800 to 7,000 temporary construction jobs and an estimated 2,000 permanent jobs across the 39 pumping stations. The pipeline will transport bitumen which is a highly viscous hydrocarbon commonly called Asphalt. There are 3 major methods of extracting the bitumen Cold Flow, Steam assist gravity drainage, Toe to heel Air Injection. Tar sands on average release 12% higher CO2 emission. Another environmental problem with the pipeline is its route through the middle of the Ogallala Aquifer in Nebraska. This poses serious problems as it will contaminate a water source that supplies 30% of US farmland. In summary, this presentation will discuss the extraction process and its impact on the environment.
05.09.06  Effects of Mango Supplementation on Clinical Parameters of Obese Individuals

Shirley Evans, Brenda Smith, Edralin Lucas, Mark Payton, Maureen Meister, Penelope Perkins-Veazie, Sandra Peterson, Stephen Clarke, Oklahoma State University

We have previously shown that mango (Mangifera indica L.) reduced body fat and improved blood glucose in mice fed high fat diet. The objective of this pilot study was to examine the effects of supplementation of freeze-dried mango on body composition and clinical parameters in obese adults. Twenty adults (11 males and 9 females) with body mass index (BMI) of 30-45 kg/m² participated in the study and were given 10 grams of freeze-dried mango daily for 12 weeks. Body composition by dual energy x-ray absorptiometry, anthropometric, and clinical parameters were measured at baseline and at the end of supplementation. There were no significant changes in body weight and composition in both genders after mango supplementation. However, BMI is significantly increased in female subjects but not male participants compared to baseline. Hip circumference is lower in male subjects but not female participants with mango supplementation. Similar to our animal findings, mango significantly reduced blood glucose concentrations in both male and female subjects. Our findings indicate that regular consumption of mango by obese individuals does not negatively impact their body weight but provides a positive effect on their blood glucose.

05.09.07  The Effects of Perceived Mental Fatigue on Exam Scores

Cameron Williams, Halet Poovey, Southeastern Oklahoma State University

The objective of this research was to examine the effect of perceived fatigue levels on students' exam scores. It was predicted that students who were mentally fatigued would score lower on exams than students who were well rested on exam day. It was anticipated that confounding variables such as; student employment; hours per week; student athlete; age range of student; children in the household; and hours the student studied for the exam; would play a role in the results. Using information from previous studies the team developed a survey to collect data relevant to the exam scores and fatigue. The data was collected from the students in a relevant course (Ergonomics). There were approximately 160 students/exams surveyed. The data was coded and entered into a database using a SPSS to conduct a digression analysis. There is now additional data being collected.
Abstracts from the 2013 Oklahoma Research Day
Held at the University of Central Oklahoma

05. Mathematics and Science

10. Forensic Science

05.10.01 Forensic Analysis of Cigarette Ash: Brand Determination Through Trace-metal Analysis

Anja Groth, Cris Lewis, James Barnes, Thomas Jourdan,

University of Central Oklahoma

Although cigarette ash is frequently encountered at crime scenes, it has largely been ignored in a forensic context. Few efforts have been made to utilize the information present in the form of trace-metal concentrations even though these could indicate the brand the ash originated from which could potentially help place suspects at crime scenes or assess how many people may have been present at a scene. This study aims to investigate the possibility of applying the distinction of cigarette brands based on the trace-metal concentrations in their ash in a forensic context. The most common American brands and the same brands purchased in different countries will be examined along with foreign brands. Cigarettes will be "smoked" using a variable-pressure peristaltic pump which allows for various smoking parameters reflecting the range of human smoking habits to be mimicked. Samples will be digested in a nitric-acid-based microwave digestion system and will then be analyzed using inductively coupled-plasma mass spectrometry (ICP/MS). The resulting database of trace-metal concentrations will be analyzed statistically using principal component analysis (PCA) to detect intrinsic differences between brands. A partial least squares-discriminant analysis (PLS-DA) will then be used to create a discriminant model capable of determining from which brand an ash sample may have originated.
Bluetooth and Spyware Hacking of Android Smart Phones: A Forensic Assessment Using FTK

Marci Brokish,

University of Central Oklahoma

This research will help in determining proper protocols and procedures to use in the forensic examination of an Android smart phone that has been compromised by a hacking exploit. This study will examine the artifacts left on an Android phone and determine whether these artifacts can provide clues to the phones compromise. An Android phone is defined as a 'smart phone.' A smart phone is a cellular phone that has the computing power of a personal computer. Therefore, an Android smart phone is susceptible to the same security issues as a laptop or desktop computer. This research will provide digital forensics examiners protocols and procedures for locating artifacts on the phone that may be useful in an investigation. There are several different ways to hack a smart phone and this study will focus on Bluetooth hacking and hacking through the use of purchased spy software. This study will research hacking capabilities using six different programs. Each program will be installed on an HP Pavilion dv4 laptop. The separate programs will then be used to attempt to hack into an Android smart phone in order to test exactly how vulnerable the phone is to a hacking exploit. Once the phone has been compromised, proper digital forensic protocols will be used to image the phone and then examine the device to locate possible evidentiary artifacts left on the phone by the attack. Once all the data has been collected, compiled, and analyzed a report will be produc

Relocation of Remains: Scavenger Scatter Patterns in North Central Oklahoma, Preliminary Findings.

Kama King, R. Christopher O'Brien,

University of Central Oklahoma

Human remains are often left exposed to the elements for a variety of reasons, which complicates the recovery of those remains. The proper identification of remains is highly dependent on the quantity and quality of remains recovered. When remains are left exposed many skeletal elements can be moved away from the deposition site through several processes. Scavenging is one of the most active of these processes. Scavenging leads to the separation of skeletal elements and the scattering of these elements. This makes recovering remains more difficult. It was hypothesized that scavenger behavior would be patterned and predictable, and that the observation of this behavior would lead to the identification of predictable patterns which will aid in the recovery of remains in the area. The activities of scavengers at placed domestic pig carcasses were monitored with still and video imaging equipment. Radio transmitters were implanted in long bones of these carcasses for tracking. The movement, both direction and distance, of the bones was tracked over time. The study has revealed that skeletal elements are moved large distances in a relatively short period of time. The skeletal elements of the pig carcasses were removed completely from the site within ten days. This indicates a very short time frame for the successful recovery of remains after deposition in an area with active scavengers. These are preliminary findings. The study will be repeated in at least three more seasons.
The Forensic Value of Processed Human Hair Extensions

Caitlin Porterfield,
University of Central Oklahoma

Human hair extensions are a nine billion dollar per year industry. Statistics indicate that over sixty percent of women have at some point invested in hair extensions. It is surprising, considering the growth of this industry, human hair extensions have never been investigated for their evidentiary value in a forensic case. A human hair extension recovered from a crime scene would likely be identified as a shed telogen human hair and processed as such. Extraction of mtDNA from the extension would place the hair donor, not the suspect, at the scene. Although it is not likely that mtDNA sequencing would result in the identification of the donor, the evidence would misdirect an investigation and result in a misuse of time and resources. In this study, processed human hair extensions will be evaluated genetically, microscopically, and chemically for their probative value in forensic casework. Current extraction techniques and detection technologies will be used to recover, quantify, amplify, and sequence mtDNA from the human hair extensions. In addition, this study will seek to differentiate between a processed human hair extension and a real human head hair based on physical, optical, and chemical attributes. Microscopy will be used to compare hair morphology. Chemical analysis using organic extraction and split injection gas-chromatography mass-spectrometry will also be conducted to detect processing chemicals used in the manufacturing of the extensions.

The Melanin Storm; How Melanin is Linked to Competitive Behavior, Murderous Activity, Genetic and Electrical Processes.

John Sparacio,
Northeastern State University

What is melanin? Where is melanin found in the human body and nature, and how does it affect humans physiologically and psychologically (behavior). This presentation will impart how limited quantities of melanin in human organisms acts subtly leading to a range of emotional states such as ruthlessness, arrogance, mercilessness, ultra competitiveness. The research will show how melanin reacts in certain human organisms and how these organisms respond within their environment both cultural and socioeconomic. It will show how behavior in low melanized human organisms cannot be contained or changed based on their genetic coding. This presentation will confer the science of melanin and how it relates to electromagnetic energy and frequencies linking melanin and light waves to extreme neural responses, and how the slightest deviation of this molecule can cause colossal changes in the organism. By continuing this study it is the researchers hope to expand and expound on these findings creating an awareness of the many uses and effects that melanin can have in our daily lives by contributing to such areas of scholarship as physics, chemistry, human biology, environmental biology, psychology, aerospace, optics, mathematics.
A reduction in the stochastic effects of low-copy number DNA amplification through the use of duplex-specific nuclease

Nicole Sambol,

University of Central Oklahoma

A study will be done to determine if the stochastic effects of amplification of low-copy number DNA could be alleviated using duplex-specific nuclease. DNA of a known concentration will be amplified using the AmpFiSTR Identifiler PCR Amplification Kit protocol, and the results will be analyzed with the ABI 3130 Genetic Analyzer to obtain control profiles. The DNA samples will then be diluted to concentrations of less than 100 pg. Amplification will be performed using the AmpFiSTR Identifiler PCR Amplification kit. PCR will be stopped after 10 cycles and the diluted samples will be treated with duplex-specific nuclease to obtain allelic normalization. PCR will then be resumed for the remaining 18 cycles according to the Identifiler protocol. Separation will be done using capillary electrophoresis on the Applied Biosystems 3130 Genetic Analyzer. The profiles produced for the diluted DNA samples will be compared to the non-diluted samples.

Deterioration of Various Cartridge Case Compositions in Selective Environments

Amanda Bevers,

University of Central Oklahoma

Examiners in the field of firearm and toolmark analysis compare characteristics on bullets or cartridge cases to determine if a specific firearm was used. Examiners can encounter ammunition components that have been exposed to or damaged by various environments when left behind, which can obscure or obstruct those characteristics needed to conduct an analysis. The proposed study seeks to classify the levels of deterioration on cartridge cases in select environments. In addition, we seek an appropriate restorative technique that may be effective in restoring characteristics necessary to draw conclusions. Fired cartridge cases were placed in six environments and collected every 31 days. The cartridge cases were cleaned with water using a sonication instrument when needed, and analyzed using a comparison macroscope. A sample size of 9 cartridges per collection interval will be chosen based on composition and analyzed using a scanning electron microscope to evaluate elements present due to corrosion over time. Should the author find suitable characteristics for comparison, conclusions of identification or unsuitable will be drawn. All comparisons will be conducted using known samples that originated from one of 2 selected pistols (9mm Beretta and 9mm Hi Point). Should the author reach a conclusion of unsuitable, the cartridge case will then be cleaned using one of the three selected restorative techniques and analyzed again.
05.10.08 Retention and Disposition of Digital Evidence in the Federal Criminal Justice System

John Mabry, Marci Brokish,

*University of Central Oklahoma*

On any given day, law enforcement agencies across the United States are busy investigating crimes and seizing digital evidence in the form of computers, tablets, cellphones and data storage devices. In fact there is hardly a crime committed today that does not have some form of digital evidence associated with it. Given the enormous storage capacity of today's devices, cyber detectives face monumental challenges in finding that digital "needle in a haystack" - that image or file which may be key to solving the case or gaining a conviction. While much attention has been given to the process of gathering and evaluating such evidence, little has been devoted to law enforcement's responsibility in eventually returning non-criminal data and hardware to victims, innocent third-parties, and even defendants themselves or their families. The purpose of this legal research is to identify the most common retention and disposition issues facing federal law enforcement agencies and, based on current law, identify key areas for improvement, and the legal consequences of mismanagement. The need for such research is evident in light of the increasing number of civil claims, suits and adverse court rulings against police for improper retention and/or disposition of evidence and hardware that is not relevant to crimes under investigation or no longer needed.

05.10.09 The State of SANE Trainings in Oklahoma

Ngan Nguyen,

*University of Central Oklahoma*

For a crime scene investigator, the crime scene is usually comprised of lifeless evidence. However, to the Sexual Assault Nurse Examiner (SANE), the crime scene is the body of the living victim who has feelings and emotions. Therefore, not all the rules that are used by crime scene investigators are applicable. As taught, safety and emergency care are more importance than collecting and preserving evidence. Similarly, providing proper treatment and care to the victims is more significant than collecting and maintaining the evidence. The nurses are the best candidates to approach such crime scenes because they were taught the medical skills that enable them to evaluate and assess the bruises, scars, bite marks, etc. on the victim's body. For that reason, SANE is an important program, especially to those who are victims to sexual assault. Unfortunately, there are only 3 participating hospitals in the Oklahoma City Metro Area---Midwest Regional, Integris Baptist and Integris Southwest Medical Centers. Each hospital is on-call as a SANE hospital on a monthly basis. Currently, there aren't enough nurses or funding for SANE to improve. For that reason, the purpose of this research (semi-structured interview) is to educate the forensic professionals about the SANE program in Oklahoma. By learning more about SANE, they can be more precise in understanding the needs of SANE. From there, they can help SANE in becoming a more effective program in Oklahoma.
05.11.01 The Role of Streptococcus Pyogenes Chromosomal Islands (SpyCI) in Survival: Response to Environmental Conditions and LmrP Expression

Christina Hendrickson,

University of Central Oklahoma

Group A streptococcus is a pathogen that causes a wide range of human disease. A prophage-like chromosomal island regulates an operon of DNA repair genes in GAS, including the multi-drug resistance protein LmrP, by dynamic excision and re-integration. LmrP confers resistance to lipophilic antimicrobials in other species. We show the contribution of LmrP to survival in GAS following antimicrobial treatment. Cell growth and survival was determined following treatment with lipophilic antimicrobial ethidium bromide in strains SF370, 4A, OKM28, and OKM29. Growth was done in normal or buffered media and at either 30, 37 or 39 degree of centigrade. Cells were treated with reserpine, sodium orthovanadate, or both. SF370 showed higher sensitivity to EtBr killing when compared to 4A. Surprisingly, inactivation of LmrP in these strains did not result in equivalent sensitivity. Treatment with RS increased both strains’ sensitivity to EtBr, demonstrating the role of proton pumps in antimicrobial survival. Altered environmental conditions showed that strains were more resistant to EtBr in buffered media compared to unbuffered media. Strain SF370 had increased sensitivity to EtBr in 39 degree. Surprisingly, OKM29 was more resistant to EtBr than the parental SF370 strain in the presence of MDR pump inhibitor NaOV. A SpyCIM1 encoded protective mechanism may exist that directly protects cells from DNA damage. Temperature also may regulate the integrative state of SpyCIM1.
De Novo Next-Generation Sequencing, Assembling and Annotation of Arachis Hypogaea L. Spanish Botanical Type Whole Plant Transcriptome

Ning Wu, Kanyand Matand, Kayla Love,

Langston University

Peanut is a major agronomic crop within the legume family and an important source of plant oil, proteins, vitamins, and minerals for human consumption, as well as animal feed, bioenergy, and health products. Peanut genomic research effort lags that of other legumes of economic importance, mainly due to the shortage of essential genomic infrastructure, tools, resources, and the complexity of the peanut genome. This is a pioneering study that explored the peanut Spanish Group whole plant transcriptome and culminated in developing unigenes database. The study applied modern technologies, such as, normalization and next-generation sequencing. It overall sequenced 8,308,655,800 nucleotides and generated 26,048 unigenes amongst which 12,302 were annotated and 8,817 were characterized. The remainder, 13,746 (52.77%) unigenes, had unknown functions. These results will be applied as the reference transcriptome sequences for expanded transcriptome sequencing of the remaining three peanut botanical types (Valencia, Runner, and Virginia), which is currently in progress, RNA-seq, exome identification, and genomic markers development. It will also provide important tools and resources for other legumes and plant species genomic research.

Online Database Research on Marfan Syndrome

Ashley Hopkins, Dawn Bender, Katherine Coppenger, Kathi McDowell, Lasay Castellanos, William Dyson,

Northeastern State University

Online Mendelian Inheritance in Man (OMIM), Genbank, Basic Local Alignment Tool (BLAST), Spidey, and Molecular Modeling Database (MMDB) are all databases used in research of genetic disorders such as Marfan Syndrome, or MFS. MFS is a complex multisystem connective tissue disorder with a highly variable phenotype. This somewhat rare disorder is attributed to a defect in Fibrillin-1 (FBN1). FBN1 is an essential component of connective tissue, and binds to calcium. OMIM provided the phenotype (#154700) for MFS. This search displays the chromosomal locus of FBN1 to be 15q21.1. OMIM also provides the mRNA RefSeq Identifier of NM_000138.4 and a protein designation of NP_000129.3. Through GenBank we were able to find that the sequence length of the gene is 11695 base pairs. Through BLAST we were able to identify similar genomic sequence to mRNA found in Pygmy Chimpanzees, Western Lowland Gorillas, and Northern White-Cheeked Gibbons. Through Spidey we aligned XM_004056150.1 a gorilla mRNA, and NM_000138.4 a Homo sapiens mRNA. The results displays a highly conserved sequence with 99.4% overall identity. MMDB indicated the gene is 1828 amino acids long and the Protein Database (PDB) number is 2W86. MMDB and the protein software known as Cn3D displays the structure of the FBN1 Homo sapiens protein.
05.11.04  The Bioinformatics Analysis of the Cystic Fibrosis Transmembrane Conductance Regulator

Kathleen Andrews, Brad Hamilton, Brian Cookson, Kathi McDowell, Megan Shelton, Michael Grant,

Northeastern State University

The Cystic Fibrosis Transmembrane Conductance Regulator (CFTR) gene encodes a chloride channel protein normally found in cell membranes. A delta F508 mutation of the CFTR gene results in a deficiency of this protein, upsetting the sodium and chloride ion balance between the cell and tissue. This imbalance creates a thick, sticky mucus layer of the passageway linings. For this project, information about the autosomal recessive CFTR gene was collected utilizing the following databases: Online Mendelian Inheritance in Man (OMIM), Genbank, Basic Local Alignment Search Tool (BLAST), Spidey, and Molecular Modeling Database (MMDB). The OMIM database indicated that CFTR is located on chromosome 7, loci 7q31.2. Genbank revealed the CFTR gene mRNA sequence is made up of 6132 base pairs and translates 1,480 amino acids. The mRNA studied in this project has a coding sequence that starts at the 133rd base pair, ends at the 4575th base pair, and contains 27 exons. A BLAST search revealed similar genomic sequences to the Sumatran orangutan (NM_001168545.1). Utilizing the Spidey database, an interspecies mRNA comparison of this organism with the human mRNA of the CFTR gene (NM_000492.3) confirmed a 98.6 % identity with 2 exons. Protein databases and MMDB provided structural representation of the gene’s image.

05.11.05  Bioinformatics Research of Classic Maple Syrup Disease

Steven Upshaw, Bailey Hammitt, Kathi McDowell, Staci Davis,

Northeastern State University

Classic Maple Syrup Disease type II is classified by its sweet urine odor in infants and is an inherited disorder where the body is unable to metabolize certain amino acids. The name of the gene is dihydrolipoamide branched-chain transacylase or DBT (OMIM *248610). This information was obtained from OMIM (Online Mendelian Inheritance in Man). OMIM was accessed to search for the genetic disorder. OMIM is commonly used by medical professionals and research scientists to study human genes and genetic diseases. The cytogenetic location is on chromosome 1 p21.2. Next, research was performed using GenBank to obtain a genetic sequence. GenBank lists the accession number as NM_001918. This is a cDNA sequence that has 10831 base pairs. The organism source is Homo sapien. BLAST is a tool used by molecular biologists, which stands for Basic Local Alignment Search Tool. BLAST compares different nucleic acid sequences. From BLAST the genomic DNA sequence for DBT was identified as accession number NG_011852. Using the Genbank’s cDNA accession number NM_001918 along with BLAST accession number NG_011852, Spidey was utilized to compare the mRNA-to-genomic alignment. Spidey showed 11 exons with an overall percent identity of 100.
05.11.06 Analysis of the X-Linked KX Blood Group Gene (McLeod Syndrome)

Jonathan Nahmias, Jason Onarecker, Kathi McDowell, Marc Scott, Patrick Schrepel, Zach Burns,

Northeastern State University

McLeod syndrome is a rare and historically significant genetic disease in humans caused by a mutation in the X-linked Kx blood group gene, given by the symbol XK. Using the gene catalog, Online Mendelian Inheritance in Man (OMIM), we found the XK gene is responsible for encoding a putative membrane transporter expressed in all parts of the body, but is primarily found in nervous tissue, heart, and red blood cells. The chromosomal location of the gene is Xp21.1. Using Genbank, another online database, we ascertained that the accession number is NM_021083, the coding sequence is 5091 base pairs, and is derived from an mRNA molecule. Using a BLAST search we were unable to obtain a genomic sequence for this gene, but the data showed a strong correlation to genomic sequences in other species. Using Spidey we performed a cross-species analysis between the XK gene on a human and a gorilla which indicated a 99.6% match in identity; only 10 of the base pairs out of the 1456 base pairs do not align. The OMIM report shows that the XK gene encodes for an antigen of the Kell blood group system often resulting in acanthocytosis. Through Genbank we learned the locus of this protein (NP_066569) and the amino acid chain length (444); however, we were unable to obtain the structure of the protein using the molecular model database.

05.11.07 Bioinformatic Analysis of Charcot-Marie-Tooth Disease Dominant Intermediate B; CMTDIB

Elizabeth Ludinich, Crystal Haun, Joleen Wilson, Kathi McDowell, LaTekia Tyson, Samantha Huffman,

Northeastern State University

Online Mendelian Inheritance in Man (OMIM), Genbank, Basic Local Alignment Tool (BLAST), Spidey, and Molecular Modeling Data Base (MMDB) are databases utilized in research of genetic disorders such as Charcot-Marie-Tooth disease (CMT). CMT is one of the most common inherited neurological disorders. CMT comprises a group of disorders that affect peripheral nerves. There are several forms of CMT; this research will focus on information pertaining to Charcot-Marie-Tooth Neuropathy, Dominant Intermediate B DI-CMTB CMTDI1. CMTDIB is caused by a mutation in the dynamin-2 (DNM2) gene. By using OMIM database, which focuses on the relationship between phenotype and genotype of a disorder, we were able to obtain the chromosomal locus of DNM2. The locus is 19p13.2 with an accession number NM_001005360. Through Genbank we found the mRNA for the gene is 3684 base pairs with the coding region starting at 191 and ends at 2803 of this sequence. Using Spidey, we are able to find that the sequence for DNM2 is 88.4% comparable to the mRNA sequence for Mus musculus gene accession number AK_171049. The gene has six highly conserved DNA coding sequences between mouse and human. By utilizing MMDB and the program Cn3D, we were able to visualize a structural representation and digital image of the protein.
**05.11.08 Melatonin Sensitivity Mutants in Caenorhabditis elegans**

Stephen Fields, Khalilah Watson, Krishna Bhattarai, Rajya Maharjan,

*East Central University*

The Caenorhabditis elegans genetic system would be a valuable tool in determining the impact of melatonin on neuronal plasticity and long term potentiation. However, components of the melatonin signaling pathway in *C. elegans* remain ambiguous. The purpose of this study is to identify the *C. elegans* melatonin receptor(s). Worm G-protein coupled receptors (GPCRs) with homology to human melatonin receptors (hMRs) were identified through BLAST searches of the GenBank database. Multiple sequence alignment of homologous protein regions was also performed using ClustalW2 software. The field was narrowed down to less than 25 genes by limiting bioinformatic analyses of *C. elegans* GPCRs to regions of functional importance. A locomotion assay was developed to determine crawling rates of appropriate strains before and after exposure to melatonin. Wild type worms demonstrated significantly slowed locomotion after exposure to melatonin, but several GPCR mutant strains carrying mutations in potential homologues to hMRs were insensitive to melatonin. A GFP transgene marking all neurons allowed measurement of tissue cultured axons in response to melatonin. *C. elegans* neurons in tissue culture have longer axons when exposed to 1 mM melatonin. Worm mutants do not exist for some potential hMR homologues, so RNAi will be used to analyze the effects of melatonin on their behavior. Of special interest will be the srh-135 and srh-287 GPCR genes, which have the same NRY motif that is unique to hMRs.

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**05.11.09 Two Proteins May Protect Red Algal Photosynthesis From High Light Damage**

Steven Karpowicz, Sukyoung Kwak,

*University of Central Oklahoma*

One helix protein (OHP) is necessary for recovery of photosynthetic activity after exposure of an organism to high light levels. Although the functional mechanism of OHP is not known, it is associated with the photosynthetic apparatus in green plants. Red algae are distant relatives to green plants, whose photosynthetic apparatus is structurally different from the well-studied green plant photosystems. We investigated if red algae contain one or more proteins with similar photoprotective function as green plants OHP. We have identified two homologous proteins relative to green plant OHP in Porphyra umbilicalis (norl), an ocean-dwelling, multicellular red alga. We are researching the function and regulation of OHP in Porphyra. Green plant OHP mRNA and protein expression responds to high light intensity, so we will investigate the regulation of the protein by comparing expression of Porphyra OHP mRNA before and after high light exposure by using qPCR. Also, we will use an OHP mutant and a complemented mutant with Porphyra OHP to compare the difference in response to high light levels by measuring the rate of growth and photosynthesis in each type. We expect to see that the function and regulation of Porphyra OHP is similar to green plant OHP and thus that red algae have similar protection mechanisms against high light as green plants.
Genetic interaction studies with Drosophila Ard1 suggest a role in regulating alternative cell death pathways

Joseph Ahlander, Jackie Stephens,

Northeastern State University

Cancer is a widespread problem, and an estimated 1.6 million people are diagnosed with cancer every year. The enzyme Ard1 is expressed in most tissues, but Ard1 has been found to be overexpressed in a wide range of cancers. Ard1 is the catalytic subunit of the NatA complex, an Nα-terminal acetyltransferase, which can alter the function of many proteins through acetylation. Our present study investigates how Ard1 plays a role in cell survival in Drosophila. Genetic crosses were performed to demonstrate that RNAi knockdown of Ard1 during eye development causes a small eye phenotype. Expression of DIAP1, a caspase inhibitor, mitigated the Ard1 loss-of-function phenotype. However, expression of caspase inhibitor p35 exacerbated the Ard1 RNAi mutant phenotype. Since DIAP1 is known to also regulate autophagic cell death, these genetic interactions suggest that Ard1 may play a role in regulating alternative cell death pathways. Our research into the function of Ard1 and the role it plays in cell survival may help to advance our understanding of cancer genetics.
Abstracts from the 2013 Oklahoma Research Day
Held at the University of Central Oklahoma

05. Mathematics and Science

12. Kinesiology

05.12.01 Relationship Between Bone Mineral Density and Exercise Dependence in Female Runners

Hannah Kostelecky,

University of Central Oklahoma

One in three women over the age of 50 will suffer osteoporotic fractures and osteoporosis is estimated to affect over 200 million women worldwide (MedTerms, 2012). Several studies exist examining exercise dependence, however limited studies could be found on the correlation between bone mineral density and exercise dependence. The primary purpose of this study is to determine if a relationship exists between bone mineral density and exercise dependence in female runners. To determine the effect long-distance running and exercise dependence have on bone mineral density, participants will be asked to fill out a running experience survey, an exercise dependence scale, and have an iDXA bone scan. Determining the correlation between exercise dependence and bone mineral density in female runners could potentially impact recommendations and guidelines for exercise, nutrition, and other health habits among female athletes, recreational runners, and health seekers. This research study is in its early stages with participants being recruited at this time. The results of this study will be determined at the completion of the 2013 Spring semester.
Nutritional Knowledge Among Division I Collegiate Athletes

John Sellers, Andrew Hall, Bert Jacobson, Dalton Delaney, Natalya Nikitina-Helvey,

Oklahoma State University

Context: Basic nutrition knowledge provides the proper framework from which sound dietary choices can be made. The physical and mental strain endured by collegiate athletes increase their need for proper dietary intake in order to maximize their performance both on the field and in the classroom.

Objective: This study will determine the nutritional knowledge of Division I collegiate athletes through the use of a survey. This will help identify the extent of nutritional information among collegiate athletes as well as the sources currently being used to obtain their information. Participants: Division I student-athletes currently participating in a collegiate sport. Interventions: Student-athletes completed a 20 question survey containing question related to basic nutritional knowledge and current sources of nutrition information. Results: 58, 22, and 62% responded correctly when asked about the recommended percent of total calories from carbohydrates, fats, and protein, respectively. 92% of the athletes responded saying they received nutritional information from their strength and conditioning coach with 62% identifying their strength and conditioning coach as their sole source for nutritional information. Conclusion: Based on the responses, nutritional knowledge is not as strong as it needs to be within collegiate athletes. Greater emphasis should be placed on providing nutritional resources including, but not limited, to registered dieticians, lectures, and handouts.
Abstracts from the 2013 Oklahoma Research Day
Held at the University of Central Oklahoma

05. Mathematics and Science

13. Mathematics

05.13.01 A simplified proof of the Kantorovich theorem for solving equations using scalar telescopic series

Ioannis Argyros,
Cameron University

The Kantorovich theorem is an important tool in Mathematical Analysis for solving nonlinear equations in abstract spaces by approximating a locally unique solution using the popular Newton-Kantorovich method. Many proofs have been given for this theorem using techniques such as the contraction mapping principle, majorizing sequences, recurrent functions and other techniques. These methods are rather long, complicated and not very easy to understand in general by undergraduate students. In the present paper we present a proof using simple telescopic series studied first in a Calculus II class.

05.13.02 Boundedness, Monotonicity and Convergence of a Sequence of Special Zeros Obtained from Fibonacci-Type Polynomials

Kristi Karber, Rebecca Miller,
University of Central Oklahoma

We considered a generalized Fibonacci-type polynomial sequence and studied the corresponding sequence of maximum real roots. After showing that the sequence was bounded, we created two subsequences from the original sequence and proved that each subsequence was monotonic. We then proved that the sequence of maximum real roots converges.
05.13.03 Broncho Tower - A Modification of the Tower of Hanoi Puzzle

Stephen Gregg, Britney Hopkins, Juan Orozco, Kristi Karber, Thomas Milligan, Tyler Powell,

University of Central Oklahoma

The Broncho Tower makes slight changes to the classic Tower of Hanoi puzzle, but maintains the same goal of moving one or more sorted disks between pegs. The main difference concerns the rules that govern how these disks can be sorted as the puzzle is solved. Our research has included trying to find a mathematical formula using a difference equations approach that models the Broncho Tower, and gives the minimum number of moves required to solve the modified version of the game.

05.13.04 An Iterative Approach to the Extended Broncho Tower Puzzle

Stephen Gregg, Britney Hopkins, Juan Orozco, Kristi Karber, Thomas Milligan, Tyler Powell,

University of Central Oklahoma

We explore the Broncho Tower, a modification of the Tower of Hanoi puzzle, by constructing a computer program. This program iteratively exhausts the possible moves that a player can make when solving the puzzle.

05.13.05 An Experimental Study of the Comparison of Water and Oil Flow Through Vertical Pipes.

Krystal Brantley,

East Central University

The purpose of this research is to study and compare water flow versus oil flow through vertical pipes. This experiment is set to find the difference of the fluid travel through vertical pipes based on pressure, volume and fluid viscosity. In this experiment, there are two facilities that are being used. Both of these facilities are vertical test stations with both top chambers being 2 inches in diameter and the barrels measuring 1 inch in diameter. After the water and the oil are shot through the facilities, the results measure the volume of fluid ejected over the same time period. The results indicate that oil and water travel differently through vertical pipes due to the relationship of viscosity to volume. Constant volume output over time requires greater pressure for the oil which has greater viscosity.
05.13.06  Dynamics of the Spread of Staph Infections in Hospitals

Princess Hays,  

*Langston University*

We investigate the in-hospital transmission dynamics of two Staphylococcus aureus (MRSA) strains, also referred to as staph: hospital-acquired Staphylococcus aureus (HA-MRSA) and community-acquired Staphylococcus aureus (CA-MRSA). We hypothesize that CA-MRSA will tend to have greatest population. To predict whether or not CA-MRSA will overtake HA-MRSA, a compartmental model has been established. Under the assumption that patients can only be colonized with one strain of MRSA at a time, global results show that competitive exclusion occurs between HA-MRSA and CA-MRSA strains; the strain with the larger basic reproduction ratio will become endemic while the other is extinguished. Using the extended model, we explore the effect of co-colonization on competitive exclusion by determining the invasion reproduction ratios of the boundary equilibria. Further investigation into co-colonization, trends with antibiotic methods and health risk factors will be explored.

05.13.07  Analysis of WWZ

Tobyn Large,  

*East Central University*

We use a competing species model with growth and death rates both researched and inferred to diagnose the zombie apocalypse. Using the population of Oklahoma and hypothesized statistics for zombies, we develop a system of differential equations to find the population of both the humans and zombies at any given time, if the apocalypse were to actually happen.

05.13.08  Fourier Analysis of Musical Instruments

Sarah Schatz, Michael Fulkerson,  

*University of Central Oklahoma*

Fourier Analysis provides a way to break up normal sound signals into components of simple sine and cosine waves. Studying this process, known as the Fourier Transform, can provide a way to "see" why instruments sound so different, even when playing the same pitch. Plotting the Fourier Spectrum of an instrument makes it easier to comprehend these differences.

05.13.09  The Game of Signs

Stephanie Duncan, Cady Murphy,  

*East Central University*

We consider five different game situations where two players have specific operation signs to place in front of the numbers 1-20. This project examines strategies to obtain a favorable outcome for the players.
05.13.10 Multisensory Mathematics: A Tactile Approach to Concepts Found in Introductory Proofs

Kristi Karber, Courtney Simmons,

University of Central Oklahoma

Many students find the transition from computational mathematics to the rigor of proof work difficult. By introducing tangible, colorful objects into traditional lectures, instructors can engage visual and kinetic learners and help demystify perplexing topics. Using this tactile approach, we’ve developed a collection of objects that can be used to illustrate fundamental definitions and theorems commonly used in mathematics courses. Students will be able to discover these concepts are not as complicated as they might expect, while having fun in the process.

05.13.11 Modeling Jazz Artist Similarities Mathematically

Andres Calderon Jaramillo, Larry Lucas,

University of Central Oklahoma

This project attempts to quantitatively model similarities among jazz piano artists by building a relatively simple probabilistic system. We limit our study to monophonic melodies which we assume retain much of the essence of an artist’s style. Our current model makes use of Markov chains to capture the substance and structure of a musical piece. At the initial stage, the system extracts information about attributes such as the transition of pitches, note durations, and phrase lengths. At its later stages, the model uses logistic regression to quantitatively compare a piece by one artist to the style of another artist.

05.13.12 Issai Schur

Charlotte Simmons, Jesse Byrne,

University of Central Oklahoma

Issai Schur (1875-1941) belongs “to those scattered over the earth” by the “Nazi storm,” as Hirzebruch put it in his 1998 address to the International Congress of Mathematicians. This talk will examine the life and death of this remarkable mathematician whose lectures at the time of his dismissal from Berlin drew between 400 and 500 students; one student who had to be content with a seat in the back of the room reported, “I used a pair of opera glasses to get at least a glimpse of the speaker.” In addition, we will also investigate the role that German emigrants such as Issai’s son Georg played on the development of the actuarial profession in Israel.
05.13.13 **Fibrinolysis: A Mathematical Approach**

Brittany Bannish, Aaron Fogelson, James Keener,

*University of Central Oklahoma*

Fibrinolysis is the enzymatic degradation of blood clots. Experiments have shown that coarse clots composed of thick fibers often lyse faster than fine clots composed of thin fibers. However, other experiments have shown the opposite result. We develop a mathematical model of fibrinolysis to elucidate the determinants of lysis speed. Specifically, we are interested in identifying when coarse clots degrade faster than fine clots. Analysis of our model shows that the experimental setup can affect which type of clot lyases faster; when the number of tissue-type plasminogen activator (tPA) molecules exposed to the front of the clot is small, coarse clots lyse faster than fine. When there are many tPA molecules at the clot front, fine clots degrade more quickly than coarse.

05.13.14 **A Meta-Analysis of the Use of Calculators in Mathematics Achievement**

Matt Garner, Karina Chavez, Kendra Parker, Vikki Orso,

*East Central University*

This is a meta-analysis research study with the objective to review numerous previously published studies that addresses the research question: Does the use of calculators effect math student achievement in (1) computation skills and/or (2) reasoning proficiency? The thesis for the study is that one can identify trends that indicate relationships among the use of calculators, computation skills and reasoning proficiency in mathematics at the upper elementary/middle school level and the middle/high school level. Fourteen articles that addressed the question were selected at random from the literature and analyzed. The results found three general trends for results across the studies. At the upper elementary/middle school level the use of calculators improved the computation skills but had no effect on reasoning proficiency. Also at this level students not using calculators improved both in computational skills and reasoning proficiency. At the middle/high school level students using calculators improved in reasoning proficiency; whereas, students not using calculators did not improve in reasoning proficiency.

05.13.15 **Using Integrals to Derive Minkowski’s Inequality for L^p Spaces**

Karina Chavez, Justin Cochran, Matt Garner, Pradeep Kshetri, Sarah Harris, Simeon Kachikwu, Stephen Gammill,

*East Central University*

By examining the L^p norm with p=1, 2, 3, 4, 5 for several different functions, we use these integrals to derive the general formula for Minkowski’s inequality. This inequality is in essence the triangle inequality for L^p spaces.
A Network Approach to a Geometric Packing Problem

Bradley Paynter,
University of Central Oklahoma

We investigate several geometric packing problems (derived from an industrial setting) that involve fitting patterns of regularly spaced disks without overlap. We first derive conditions for achieving the feasible placement of a given set of patterns and construct a network formulation that, under certain conditions, allows the calculation of such a placement. We then discuss certain related optimization problems (e.g., fitting together the maximum number of patterns) and broaden the field of application by showing a connection to the well-known Periodic Scheduling Problem. In addition, a variety of heuristics are developed for solving large-scale instances of these provably difficult packing problems. The results of extensive computational testing, conducted on these heuristics, are presented.

To Remediate or Not To Remediate? That is the Question.

Sarah Schatz, Cynthia Murray, Michael Haszto, Tracy Morris,
University of Central Oklahoma

To Remediate or Not To Remediate? That is the Question. Sarah Schatz, Michael Haszto, Tracy Morris, Cynthia Murray Do incoming college freshman take remedial Math and Reading classes when necessary? At many colleges, these classes are required when a student does not score high enough on a college entrance or placement test. If not required, however, is performance on required high school tests related to the decision to take remedial classes? Also, is the ethnicity of a student related to his or her likelihood to take remedial classes? This study followed over 7,000 graduating high school students from New Mexico. These students were tested over their Math and Reading skills during their Junior year of high school and followed through their first year of college. Test scores and demographics were recorded, as well as enrollment data from the first year of college. Logistic regression was then used to construct a model for predicting whether or not a student takes these remedial classes. It was concluded that scores from the high school tests are significantly related to a student's decision to take remedial classes. There is also a noticeable difference between certain ethnicities with regard to the predicted probabilities of taking remedial classes.

What Can We Do for Amanda? Enhancing Student Success in Remediation

Charlotte Simmons, Jesse Byrne, John Barthell, Myron Pope, William Radke,
University of Central Oklahoma

Remediation is regarded as the biggest obstacle to President Obama's call for millions of additional graduates. This talk chronicles the challenges and successes of remediation reform efforts at the University of Central Oklahoma that have yielded pass rates of 78% over the past year.
Undergraduate research: the focus of the Oklahoma NSF STEP Program and UCO CURE-STEM

Wei Chen, Charlotte Simmons, Evan Lemley, Phd, John Barthell,

University of Central Oklahoma

Undergraduate research has been proven to be effective in recruitment, retention, and graduation of STEM majors. It is the focus of the National Science Foundation (NSF) funded Oklahoma STEM Talent Expansion Program (STEP), which supports students through STEM research and educational experience. The success of undergraduate research depends on the active involvement of faculty mentors. To provide a platform for faculty participation, the College of Mathematics and Science at the University of Central Oklahoma (UCO) established the Center for Undergraduate Research & Education in Science, Technology, Engineering & Mathematics (CURE-STEM). This Center provides faculty who are engaged in undergraduate research activities with reassignment time, faculty/student professional travel funds, and laboratory supplies. The STEP program and CURE-STEM provide the students with the opportunity to continue research with faculty members throughout their undergraduate experience, along with another NSF funded grant that provides scholarships (S-STEM). STEP participants have given numerous research presentations at regional, national, and international meetings, and many have co-authored peer-reviewed publications and conference proceedings papers. The retention rate and GPAs of STEP participants who are actively involved in research are significantly higher than for those who are not. The overall STEM enrollment at UCO has increased 50% over the past six years.

Using Integrals to Derive Hölder’s Inequality for L^p Spaces.

Cerina Stiles, Connor Keith, Kshitiz Shrestha, Robert Brown, Sanju Khatri, Stephanie Maas, Stephen Weatherby,

East Central University

By examining the L^p norm with p=1, 2, 3, 4, 5 for several different functions, we us these integrals to derive the general formula for Hölder’s inequality. This inequality states that the L^1 norm of the product of two functions is less than or equal to the product of the L^p norm of one function and L^q norm of the other function, where p and q are conjugate exponents.
05.13.21  Random Number Generation: The Linear Congruential Method

Joshua Crittenden,

East Central University

A random number is a number that is generated in a completely unpredictable way, but how is a number defined to be random. For instance, is 2 a random number? It is in fact impossible to identify a single number as being random without knowing the procedure from which it was formed. It is for this reason, when examining randomness it is necessary to instead look at sequences of random numbers. There are many types of random number generators, but the focus of this research is linear congruential generators, also known as Lehmer generators. We will use the process discussed by Donald E. Knuth in his book The Art of Computer Programming. In this process four “magic numbers” are chosen: the modulus, the multiplier, the increment, and the seed. All congruential sequences repeat themselves. The count of numbers in the sequence, before it starts to repeat, is called the period. Thus a good random number sequence will have the maximum period possible. In order to maximize the period of the sequence, we must choose our four numbers carefully, but we will be programming our recursive function into a computer. So, the choices will have to be made in a way to avoid overflow on a 64-bit machine.

05.13.22  An Algorithm for Civil Aircraft Altitude Adjustment Over Precipitous Terrain

David Stapleton,

University of Central Oklahoma

Some results are presented from an algorithm that uses Level 1 DTED (Digital Terrain Elevation Database) data to compute a database of baseline altitude adjustments over the earth that can be applied to offset meteorological risks posed to IFR aircraft over precipitous terrain. Each baseline adjustment is called a Precipitous Point Value or PPV, and the database consists of one PPV assigned per point to grid points on the earth’s surface. At each grid point the algorithm considers statistics of nearby points and constructs a best fit plane. The height adjustment for a given segment of a given procedure is obtained by scaling the largest PPV in the flight segment. The purpose of the algorithm is to develop a database of offsets for civil aircraft flight procedure designers that improves upon current algorithms.

05.13.23  Mathematical Models of Synchronizations of Yeast Cell Glycolytic Oscillations.

Nathan Pezant, Brittany Bannish, Sean Laverty,

University of Central Oklahoma

Glycolytic oscillations of yeast cells in particular environments have been observed for some time. Recently it has been shown that yeast cells in this environment that are out of phase with one another, if put into contact, will synchronize their oscillations. Models have been constructed to simulate this observation. Our research is on the sensitivity of parameters in the existing two-cell model and expansion of the model to include three or more cells.
05.13.24 Bound Smoothing using Euclidean Squared Distance Matrices

Heather Magee,

University of Central Oklahoma

A distance matrix $A$ which encodes squares of pairwise distances in matrix form is known as a Euclidean Squared Distance Matrix (ESDM). Bordered ESDMs are useful in determining the embedding dimension of points in space. We investigate known methods that use these bordered ESDMs to improve the bounds on unknown distances of four points in three dimensional space (using the triangle inequality) and extend these ideas to five points.

05.13.25 The Effect of Temperature on Glycolytic Oscillation Synchronization in Yeast Cells.

Mark Wissler, Brittany Bannish, Sean Laverty,

University of Central Oklahoma

Previous research has been conducted on Saccharomyces Cerevisiae, a species of yeast, to examine the rate at which glycolytic oscillations between two populations of yeast cells will synchronize. It has also been shown experimentally that temperature affects steps of the metabolic pathway of this species. However, no mathematical models address temperature's effect on the procession of glycolytic synchronization between two populations of yeast. It is hypothesized that temperature will expedite the synchronization process within a range of biologically sensible temperatures. We will derive rate constants based on temperature, then compare the behavior of models with published figures in biologically relevant papers. Additionally, special interest will be placed on autonomous temperature forcing functions and their effect on the system.

05.13.26 Linking immunology and epidemiology with mathematical models: effects on individual disease and public health

Sean Laverty,

University of Central Oklahoma

We use a mathematical model that includes the dynamic nature of the host immune response, and explore the interactions between the immune system of the individual and the spread of infectious disease in the population. In particular, we identify features of the host immune response that yield the emergence of ‘disease cycles’ in the host population. We show that the immunogenicity of the pathogen and the rate at which immunity wanes in the host are key determinants of oscillations. Using the human rhinoviruses as a model system, we explore the dynamics of a diverse collection of co-circulating viruses, whose transmission in the population is mediated by the immunological history of the individuals.
ABSTRACT Purpose. We evaluated the axis orientation of PureVision® 2 for Astigmatism (Bausch & Lomb, Rochester, NY) lenses to conclude whether or not these lenses provide successful (± five degrees of six o’clock) orientation. Successful orientation with one diagnostic lens in less than ten minutes will likely encourage the use of this lens in practices and allow practitioners to decide whether or not the implementation of this lens will be time and cost effective. Methods. We fit 60 astigmatic eyes (34 test subjects) with PureVision® 2 for Astigmatism soft toric lenses and recorded the orientation of the lenses at one, five, and ten minute intervals. Results. PureVision® 2 for Astigmatism stabilized within five degrees of six o’clock 38.33%, 58.33%, and 58.33% of the time at one, five, and ten minutes post-application, respectively. Conclusion. PureVision® 2 for Astigmatism positioned within five degrees or less of six o’clock 58.33% of the time at both five and ten minutes. We conclude that a practitioner can expect approximately 60% of PureVision® 2 for Astigmatism initial diagnostic lens toric markings to be oriented within five degrees of six o’clock by five minutes post-insertion. Key Words: PureVision® 2 for Astigmatism, stabilization, rotation, astigmatism, toric

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05.14.02 The Accuracy of iCare Tonometry Over Silicone Hydrogel and Hydrogel Contact Lenses

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Northeastern State University

Purpose: The purpose of this study is to assess the accuracy of intraocular pressure (IOP) using the iCare over disposable hydrogel and silicone hydrogel contact lenses of different powers. Methods: The experimental group was comprised of twenty subjects. IOP measurements were taken on the subject’s right eye using the iCare. The contact lens powers included +3.00, -3.00, +6.00, -6.00. A total of ten IOP measurements were taken with eight measurements being over a contact lens. The first and the last measurements were without contact lenses. Results: An ANOVA showed that material, power, and the interaction between the two (material with power) all are statistically significant. Although, the ANOVA shows material as significant, the Scheffe Post Hoc test reveals that no group (hydrogel, silicone hydrogel, or no lens) was significantly different than the rest; and in regards to power, +6.00D was significantly different than -6.00D, -3.00D, +3.00D, and no lens. The non linear plots do not show a significant trend in detecting differences between the two measures of IOP (with and without contact lenses) as a function of their mean value for powers +3.00, -3.00 and -6.00. It does, however, show a significant difference when using the +6.00 lens. Conclusion: IOP did not change significantly for lens powers +3.00, -3.00 and -6.00, but did change for +6.00 D. Therefore, when performing iCare tonometry on patients with more than 3.00D of hyperopia, the contact lens should be re

05.14.03 Tonometry for the Management of Glaucoma

Kelsey Grounds, Jenna Lighthizer, Sarah Boone,

Northeastern State University

Purpose. To evaluate the agreement of intraocular pressure measurements obtained by the Goldmann applanation tonometer and the new ICare ONE tonometer. Methods. Intraocular pressure measurements were obtained in the eyes of 31 normal, healthy subjects aged 20-40 years using the ICare ONE tonometer and the Goldmann applanation tonometer. Subjects were divided randomly into two groups to vary the order in which the tonometers were used. All Goldmann applanation tonometry measurements were made by the same examiner, who was masked to the readings obtained. Questionnaires were given to each subject asking about his or her experience with the ICare ONE tonometer. Results. Intraocular pressure measurements were found to read slightly, but not significantly, lower with the ICare ONE tonometer compared with the Goldmann applanation tonometer (mean bias ± SD of 0.131 ± 2.901 mmHg). Upper and lower 95% limits of agreement between readings with the ICare ONE and Goldmann tonometers were +5.933 mmHg and -5.671 mmHg, respectively (0.1311 ± 5.802). Conclusion. Intraocular pressure measurements obtained with the ICare ONE tonometer show excellent correlation with those provided by the Goldmann applanation tonometer, the gold standard of tonometry. Measurements using the ICare ONE in normal, healthy subjects produced a small, statistically insignificant bias when compared with the Goldmann applanation tonometer.
05.14.04  Academic Predictors for Success in Optometry School

Randall Sauer,

Northeastern State University

The purpose of this retrospective study is to examine the predictive reliability of incoming ACT scores, undergraduate grade point average, undergraduate science grade point average, optometry school GPA, and Optometry Admission Test scores in predicting success in optometric education. Success in optometry school is defined as National Board of Examiners in Optometry Part One score and cumulative optometry school GPA. Eleven years of student data (2000-2011) collected from Northeastern State University- Oklahoma College of Optometry. 275 student academic transcripts and admission data were made unidentifiable to by a school administrator. Data was analyzed using a step-wise linear regression. Total OAT score was found to be statistically significant to performance on NBEO Part 1 test scores (R=.556). Correlation improved when undergraduate GPA was added to the model (R=.601). NBEO Part 1 scores can be predicted by the following probability model equation: NBEO=770.705 + (2.923 x total OAT score) + (90.981 x undergraduate GPA). In predicting optometry school GPA upon graduation, undergraduate GPA (p<.001) (R=.509) was the most correlative. The ability to predict optometry school GPA improved when total OAT score was included with undergraduate GPA (R=.570). Optometry school GPA can be predicted by the following equation: Optometry school GPA= .088 + (.537 x undergraduate GPA) + (.005 x OAT).

05.14.05  Selective Laser Trabeculoplasty Outcomes in Native American Glaucoma Patients

Chad Mies, Josh Golden, Michelle Welch,

Northeastern State University

Purpose. The purpose of this study is to question whether the SLT procedures performed at Northeastern State University Oklahoma College of Optometry provide proper IOP lowering effects in the Native American population that we provide eye care. Methods. Our research was based on a retrospective chart review of the outcomes of SLT surgeries performed on Native American glaucoma patients. Pre- and post-operative IOP measurements were collected from the medical charts of twenty five patients who have had an SLT procedure done over a four year time period. The significant time intervals of which IOP measurements were taken into consideration for statistical analysis are the following: 1. Initial IOP reading (pre-SLT) 2. 2-6 weeks post-op 3. 5-7 months post-op. Results. We found no statistically significant difference between IOP reduction at 2-6 weeks post-op and 5-7 months post-op in either eye. The average IOP reduction was approximately 14% at 2-6 weeks and 12.75% at 5-7 months. Conclusion. Our research showed that SLT performed at NSUOCO has been effective at lowering IOP in many glaucoma patients. The average decrease in IOP was slightly less than expected from what previous research has shown. Many factors could have contributed to these results including clinician variability, patient compliance, and diurnal variation of IOP.
Correlation between viewing distance and asthenopia associated with viewing of three-dimensional televisions

Erin Ridder, Bonnie Rigney,

Northeastern State University

Asthenopia symptoms may include blurred vision, headache, tiredness, soreness, and pain concentrated around the eyes. We used active shutter technology, which is most commonly used for 3D televisions. Manufacturers of 3D televisions list the optimum viewing distance, which seems close in relation to normal television viewing. We hypothesize that more subjects will have asthenopic symptoms while viewing at a shorter viewing distance, due to the greater dissociation between accommodation and convergence.

Survey Review of the Demonstrated Benefits of Completing an Optometric Residency

Sarah Mulliniks, Emily Bruce,

Northeastern State University

INTRODUCTION Graduating optometry students are challenged with the decision of whether or not to complete a residency. Further, many factors currently exist that were not considered during previous residency studies. The goal of this research project is to provide current information for optometry students demonstrating the benefits they may receive from completing optometric residency training.

METHODS We anonymously surveyed the optometric residents from each of the schools and colleges of optometry in the United States from the previous five years using a survey company called CheckBox. RESULTS Of the 109 residents who completed the survey: almost half (48.62%) chose to enter private practice, 76.64% received up to four job offers, 73.79% currently earn between $75,000 and $124,999, over half (56.88%) incurred a student loan debt between $100,000 and $200,000, 30 are FAAO certified, 10 are ABO certified, 95.41% felt completing an optometric residency better prepared them for their current job positions, and 99.10% stated they would complete a residency again if given the choice. DISCUSSION Many of our survey findings seemed to contradict commonly held beliefs about reasons students choose to enter residency programs and the benefits a residency program provides. Our survey results will be a source of the current advantages and benefits of optometric residency programs for optometry students to reference when choosing whether or not to pursue an optometric reside.
05.14.08  Tear Osmolarity Changes after Instilling Isotonic Hyaluronate Artificial Tears

Owen Setter, Aaron Reinert, Thomas Salmon,

Northeastern State University

Introduction. Tear hyper-osmolarity may be a fundamental cause of dry eye. Blink Contacts contains hyaluronate, which is designed to bind water and protect against evaporation and hyper-osmolarity. It may therefore be an effective treatment for dry eye. Purpose. Our purpose was to measure changes in tear osmolarity over time following instillation of Blink Contacts and normal saline in order to better understand artificial tear efficacy and to gain a rational basis for dosing schedules. Methods. After taking baseline TearLab osmolarity measurements, four subjects received a drop of Blink Contacts, and four received normal saline in both eyes. We measured tear osmolarity five minutes later, and then at 15-minute intervals up to 95 minutes. Subjects also rated comfort at each time. The following day, the experiment was repeated with the drops switched for each subject. Results. There was no statistically or clinically significant change in tear osmolarity over time for either drop, and there was no significant difference between the two drops. Comfort ratings showed no significant difference between Blink Contacts and saline at any time. Conclusions. Since neither drop significantly affected tear osmolarity or comfort at the times tested, the result are inconclusive. Small sample size, insufficient number of dry eyes and variability in the TearLab data may have contributed to these findings. Further research with more subjects is warranted.

05.14.09  Melanoma Screening in Primary Eye-care: Dermoscopy vs. Gross Clinical Visualization

Andrew Whitley, James Thirion,

Northeastern State University

Does dermoscopy of suspicious skin lesions permit significantly greater diagnostic accuracy of melanoma than clinical visualization alone? Methods: A dermoscopy training tutorial for optometrists was created. The tutorial was presented to study participants in a multimedia/power-point format. A cohort of 1 clinically experienced and 11 inexperienced subjects were trained with the tutorial. The subjects were asked to visually screen gross lesions (presented as photographs) utilizing the conventional screening methods of gross observation and analysis taught in the NSU-OCO optometry program. After the dermoscopy tutorial training, the subjects were given dermoscopic images of the same lesions and asked to employ the dermoscopic screening criteria taught in the tutorial. Improvement in the diagnostic yield after training was scored and analyzed with common statistical methods. A control group containing 3 inexperienced subjects and 2 experienced subjects was used. This group did not undergo tutorial. Experimental group screening sensitivity improved from 52% to 79%. Specificity dropped from 46% to 20%. Conclusion: Overall screening sensitivity improved by dermoscopy. Dermoscopy effectiveness was neither proved nor disproved, due to the drop in specificity. More studies are needed to confirm the usefulness of dermoscopy as a melanoma screener in primary eye-care.
Was Rembrandt Strabismic?

Roger West, Nicholas Mondero, Russell Crotty,

Northeastern State University

ABSTRACT Purpose. We studied a set of Rembrandt's self portraits to reassess a previous claim that those portraits show that Rembrandt had a large exotropia, which was based on measured differences between the painted irises. Methods. We scanned 10 of Rembrandt's 24 self portraits that depict significant ocular detail; the five with the largest measured difference between the irises, and the five with the smallest. Then, the right and left eyes in each image were occluded using Photoshop to produce two additional images that gave monocular gaze. Thirty observers then judged where the portraits appeared to be gazing within the plane of their face. Results. Rembrandt's apparent strabismus was large for only a short time early in his career, which would not be typical of a true strabismus. Also, the one portrait whose head was turned in the direction opposite to the others showed the opposite eye as troping. We also examined portraits that Rembrandt and his students produced of other presumably non-strabismic individuals, and found similar exotropic postures. Conclusions. We conclude that the apparent exotropia in Rembrandt's self portraits may have been simply a preferred artistic style.
Abstracts from the 2013 Oklahoma Research Day
Held at the University of Central Oklahoma

05. Mathematics and Science

15. Pharmacy

05.15.01 Controlled Drug Delivery Systems

Matthew Griffith, Ashley Hartsell, Garrick Friesen, Hardeep Saluja, Kaci Hall, Tanya Harrelson,
Southwestern Oklahoma State University

Substantial advancements have been made in controlled drug delivery systems in the last twenty to thirty years due to contributing advancements in biopharmaceutics, pharmacokinetics, and pharmacodynamics. In delivering optimal drug therapy, the desire is to maintain a drug concentration within the therapeutic window to ensure efficacy and minimize toxicity. Research has shown that dosing more than once to twice daily in order to achieve optimal therapy results in less patient compliance. Therefore, extensive research and attention has been directed to the development of controlled drug delivery systems. These dosage forms allow for controlling the rate of drug delivery, sustaining the duration of therapeutic activity and targeting the delivery of drugs to tissues among other advantages. The objective is to display the five common controlled drug delivery systems used in optimizing drug therapy and increasing patient compliance. These five dosage forms range over a short time span in relation to the history of pharmaceutics, but each has been developed to improve therapy in one of the three manners previously listed. The controlled drug delivery systems included are enteric coating, micro-encapsulation, transdermal delivery, osmotic pumps, and intravaginal rings. The benefits of modified release dosage forms can result in increased patient compliance, decreased side effects, decreased spikes in concentration, enhanced bioavailability, the ability to target specific organs or

05.15.02 Health Challenges in Tanzania: Report of Public Health Screening Initiative

Linda Rider,
University of Central Oklahoma

A team of healthcare workers traveled to Tanzania to facilitate a primary health screening initiative with citizens of Tanzania. In Tanzania the culture is rich and diverse, and there are numerous challenges to effective health care. Findings both from experience and from other resources are compared and contrasted between health experiences in the United States and Tanzania. This poster is a presentation of the challenges and findings of the health screening activities. The most common findings were hypertension, high blood sugar (diabetes), anemia, and heart murmurs in children.
Dissolution Profile of Indomethacin Formulations with Complexation of Counter-ions in a PVP Matrix

Andrew Mansour, Hardeep Saluja, John Thompson,

Southwestern Oklahoma State University

Crystalline Indomethacin (IMC), a Non-steroidal Anti-Inflammatory Drug (NSAID), suffers from poor solubility in an aqueous environment. A strategy to increase the solubility of IMC and similar drugs has been to create an amorphous solid dispersion of the drug. The amorphous form of the Active Pharmaceutical Ingredient (API) allows for a less ordered structure, and requires less energy to dissolve the solid form into the solvent. Amorphous formulations undergo a solid-state transformation, spontaneously converting back to the more stable crystalline form, decreasing solubility. A strategy to slow this process is to incorporate the API into complexes with polymers such as Polyvinylpyrrolidone (PVP). In this study we compared the effect of adding an HCl salt to the PVP-indomethacin complex in an effort to improve solubility. Formulations were dissolved under heated solvent @ 50 C, and evaporated under vacuum with a Rotovap to solidify an amorphous solid. The solid formulation was scraped, oven-dried, and stored in a tightly sealed container at room temperature. Dissolution studies were performed using a Varian 7100 dissolution apparatus per USP methods. IR spectra of each sample were recorded in tandem with dissolution procedures to differentiate the absorption differences between the samples. The analysis of the data showed a more rapid initial solubility of the IMC-PVP-Counter-ion complex, but all compounds experienced a drop in concentration after the 3-hour mark.
05. Mathematics and Science

16. Physics

05.16.01 Examining Acoustic Attenuation Coefficient In Salt Water Solution

Chiemi Standridge,
East Central University

The experiment indicates the acoustic coefficient attenuation in salt water solution using 1Mhz and 4Mhz transducer. Two types of salt will be used in the experiment, rock and table salt. The values of attenuation coefficient will be plotted against the value of concentration of salt. This is an updated version, the same one I presented at Research Day.

05.16.02 Size and Mass of Cooper Pairs in Superconductors

Sasha Townsend, Jon Snellgrove, Tyler Nitsche,
Tulsa Community College

Superconductivity is a remarkable phenomenon characterized by the complete vanishing of electrical resistance which allows a current to circulate around a superconducting wire indefinitely and by the ability to expel magnetic fields that permit a superconductor to levitate above or below a magnet or vice versa. The expulsion of magnetic fields is called the Meissner effect. Superconducting properties of materials arise from formation of electron pairs, called Cooper pairs. The microscopic parameters of superconductors, including mass and size of Cooper pairs, can be probed via measurement of the profile of the magnetic field penetrating the superconductor in the Meissner state. This is a project currently running at Tulsa Community College and supported by the National Science Foundation. Results obtained in this project will be presented and discussed.
Kristen Howard,  
*East Central University*

Through this research I will obtain the acoustic attenuation coefficient in saltwater. In this experiment I used a 1MHz and a 4MHz transducer as well as rock salt and table salt. To find the attenuation coefficient I poured water mixed with salt increasing from five to eighty grams of either rock salt or pure salt into a cell block. I then used the 1MHz or 4MHz transducer to determine the amount of time it took the sound waves emitted from the transducer to travel from one end of the cell block and back. To find the acoustic attenuation coefficient I used Beer’s Law α=\((-\ln(A/A_0))/2fx\). A is the second peak in mV, A₀ is the first peak in mV, f is the frequency of the transducer, and x is the cell width. The values of the attenuation coefficient were plotted against the values of concentration of salt to examine patterns between the saltwater. The results of rock salt: 1MHz transducer α=-0.395 dB/MHzcm, 4MHz transducer α=-0.328 dB/MHzcm. The results of pure salt: 1MHz transducer α=-0.359 dB/MHzcm, 4MHz transducer α=0.184 dB/MHzcm. The acoustic attenuation coefficient and optical attenuation coefficient may have a linear or predictable relationship. If this idea is correct it can help with the over treatment and under treatment of patients during laser surgery. By improving the technique to obtain the acoustic attenuation coefficient the relationship with optical attenuation coefficient can be found. We must also examine why alpha is negative and
05.17.01 Heterosexism: Can It Predict Homosexual Discrimination in Adoption?

Evelyn Stratmoen, Thomas Hancock,

University of Central Oklahoma

According to the U.S. Census Bureau, 24% of homes are a traditional family, and 165,000 children are waiting to be adopted. Adoption agencies report that 25% of rejections are due to the sexual orientation of the couple. Previous research has indicated that a child is not harmed when raised by same-sex parents. Perhaps the persistence of these rejections is due to heterosexism. A significant aspect of heterosexism is in the compliance of strict gender roles, the enforcement of traditional family structures, and granting special privileges and rights to heterosexuals over lesbians and gay men. Hence, it might be the heterosexist beliefs of adoption professionals that are a hindrance to same-sex couples in the adoption process. It is our hypothesis that the level of heterosexism would affect the number of rejections to a same-sex couple, regardless of the household income. Four different adoption scenarios were developed for the study. The scenarios differed only by income and gender of the couples. Participants were asked whether they would accept or reject the adoption, confidence level in the decision, and to provide explanation. They took the Attitudes Towards Lesbians and Gays (ATLG; Herek, 1988), a 20-item scale that is designed to measure the level of heterosexism. The results showed that 92% of the participants accepted the adoption. Analyses on individual groups as well as content analyses on the themes of the explanations will be displayed, as well as reference
The Relationship Between Digit Ratio and Interhemispheric Transfer Time

Wilmon Brown III, Rachel Messer, Shelia Kennison,

Oklahoma State University

The research investigated whether prenatal exposure to androgens (as assessed by digit ratio, McIntyre, 2006) would be related to how quickly information is transferred between the hemispheres of the brain. In the present study, we assessed prenatal exposure to androgens using measurements of digit ratio (Manning et al, 1998) and assessed interhemispheric transfer time using Savage and Thomas’ (1993) interhemispheric transfer manual reaction time task. The participants in the study were 31 students enrolled in courses at Oklahoma State University. Participants completed the IHTT task (Savage & Thomas, 1993). Later, the lengths of their fingers on each hand were measured using a digital caliper. According to the data that was collected, the IHTT is related to digit ratio on the right hand for both men and women, but in opposite directions. For women, smaller digit ratio on the right hand is related to longer IHTT ($r=-.496$, $p=.05$). For men, smaller digit ratio on the right hand is related to shorter IHTT ($r=+.659$, $p =.03$). The results supported the hypothesis that digit ratio would be related to IHTT. They further indicated that the relationship differed for men and women. Prenatal exposure to androgen appears to slow IHTT for women but facilitate it for men. The relationship between digit ratio and IHTT has future implications that digit ratio may be an external physiological indicator of other cognitive processes, such as learning.

Correlating Effects of Conformity: Egoism and Prosocial Behaviors

Amber McCoy,

University of Central Oklahoma

Conformity is the actions in which individuals behave or interact within a group (Baron, 1973). This set of experiments is a modification of Asch’s conformity studies (Jacobson, 2011). This study involved examining the interaction between genders to see the effect on individual conformity. The experiment identified key attributes that an individual conforms to and identified what causes individuals to adapt to gender in their discourse community. This experiment exposed how gender plays a prime role in conformity. The study examined the role of gender in conformity, showing that participants conformed to males regardless of ethnicity ($p < .05$). Additionally, it is demonstrated that, regardless of the participant’s gender, individuals conformed to the males ($p < .05$). This study is important because it identified what individuals will more likely conform to. The results of this study relate to egoism and prosocial behaviors by how individuals conform. Keywords: gender roles, conformity, egoism, altruism, ethnicity.
**05.17.04  Self, Give Me Strength: The Rise of Self-Esteem Following Child Mortality Salience**

Jenel Cavazos, Christopher Ditzfeld,

*Cameron University*

Proponents of Terror Management Theory (TMT) posit that one of the basic functions of self-esteem is to provide a coping mechanism whereby individuals exaggerate their positive self-views in order to manage the threat of death. The current study examines whether this adaptive function will extend to gene-perseverance as well. We predicted that self-esteem would be symmetrically heightened in parents who imagined the death of their child and those who imagined their own death. One-hundred ten parents with at least one biological child completed measures including a traditional self or adapted child mortality salience manipulation (or control), a self-esteem scale, and a number of other questionnaire measures. A Target (child, self) x Manipulation (MS, control) ANOVA showed that self-esteem was higher after mortality salience than after dental pain across both child and self conditions. Additionally, self-esteem was significantly higher after imagining the death of a child than after imagining the child experiencing dental pain. These data demonstrate that the bolstering of self-esteem to protect the self from the threat of one’s own morality extends to the threat of losing one’s offspring. When nature reminds us that life can be unjust (e.g., a parent should not outlive a child), people may react by increasing their reliance on self, to which they may feel the power to control. As such, the self can persevere even under the most psychologically painful of circumstances.

**05.17.05  Oxytocin as a Mitigator of Aggression**

Stephanie Menotti, Amelia Brewer, Lindsey Osterman,

*University of Central Oklahoma*

This study explored the effects of oxytocin on aggression and examined whether increased oxytocin levels lowered aggression. The hypothesis for the current study is that participants who receive an oxytocin stimulus will show less aggression in scores on a partner rating task than the participants who did not receive the oxytocin stimulus. Furthermore, it is hypothesized that the participants in the oxytocin groups will have a lower ratio on a word completion task which measures the cognitive accessibility of aggressive concepts. Participants completed a task that induced frustration and then completed a word completion task that showed cognitive preparedness for aggression and a partner rating task which measured aggression. Each participant viewed a video prior to or following the aggression task. The video either raised oxytocin or was neutral, depending on the condition the participant was in. Results for the study showed a trend for the word completion task in predicting a lower cognitive assessment of aggressive concepts. Due to this trend, the hypothesis that oxytocin will lower aggression is partly supported.
Sibling Attachment, Parental Attachment, and Perceived Differential Treatment

Tiffany Russell, Alicia Limke,

University of Central Oklahoma

Sibling relationships may be one of the longest lasting in peoples' lives; yet, there is little research applying attachment theory to adult siblings. This correlational study investigated the relationship between sibling attachment and parental attachment, in addition to considering the effect of perceived parental differential treatment (PDT) on adult siblings' attachment to each other. It was predicted that attachment would predict current sibling relationships and perceived PDT, such that participants reporting high levels of perceived PDT will report insecure attachments as well as low-quality sibling relationships. Participants completed four forced-choice questionnaires online, which measured their attachment security and perceived PDT. Attachment avoidance and attachment anxiety towards siblings predicted perceived differential maternal and paternal affection, such that as attachment avoidance and anxiety towards siblings increased, participants felt less favored by their parents. Attachment anxiety (but not avoidance) predicted perceived differential maternal discipline, such that as attachment anxiety towards siblings increased, participants felt less overly-disciplined by their mothers. Additionally, attachment avoidance (but not anxiety) predicted perceived differential paternal discipline, such that as attachment avoidance towards siblings increased, participants felt less overly-disciplined by their fathers.

Personality Correlates of False Confessions

Kathryn Schrantz,

University of Central Oklahoma

The goal of the current study was to examine the association between self-esteem, dissociative experiences, need to belong, self-monitoring, social desirability, and the probability of false confessions. In the current study, 40 undergraduate students completed personality measures and Kassin and Kiechel’s (1996) computer crash paradigm. Researchers coded both whether or not a confession was offered following the crash (false confession) as well as whether participants explained their fault to a confederate following the study (internalization). It was predicted that low self-esteem, unstable self-esteem, high dissociative experiences, and high need to belong would predict providing a false confession and subsequent internalization of that confession. Furthermore, it was predicted that high self-monitoring and high social desirability would predict providing a false confession but not internalization of that confession. These hypotheses were only partially supported. Need to belong was a significant predictor of false confessions. No other significant predictors were found.
05.17.08 Demographic Differences in Employee Perceptions of Performance Based Evaluations: A Qualitative Analysis

Brandon Pickens, Robert Mather,

University of Central Oklahoma

The research project seeks to discover if the gender, race, and age of a supervisor/manager has an impact or influence on the perceived value of a performance evaluation/appraisal. Data for this project will be collected through a confidential qualitative questionnaire on faculty and staff at the University of Central Oklahoma. It is expected that age and race will have the most impact on the judgments the individuals give in response to the questions asked. Age and race are the most controversial when it comes to demographics, but attention will be given to other demographics as well. This study is important because it has the ability to provide insight into an individual's perception regarding how to deal with people as it relates to work performance in a world where dealing with different ages, races and genders are a norm.

05.17.09 The Role of Extracurricular Activities on Sexual Behavior

Beau Leaf,

University of Central Oklahoma

I have proposed that individuals who have participated in or are currently participating in an athletic extracurricular activity any time during their lives may experience a higher prevalence of sexual contact and/or engage in risky sexual activity versus those who are or have participated in a non-athletic extracurricular activity. An Extracurricular activity is defined as an educational activity not falling within the scope of the regular curriculum, i.e. music lessons, any sport, art, acting, academic organizations. Past research shows that among sexually active college students, males reported a higher prevalence of unprotected sex and multiple sex partners than females and both males and females report elevated sexual risk taking. Research in male athletes has shown that there is an increase in testosterone levels while participating in the sport, watching the sport, or by being in an athletic environment, i.e. gym, locker room. Sexual behavior research began in the 1930's by Dr. Alfred Kinsey. From his extensive research, there were two profound publishings: Sexual Behavior in the Human Male and Sexual Behavior in the Human Female. After publication of these books, both venereal disease reduction and an elevated level of sexual satisfaction among married people occurred. The study of sexual behavior in human beings is imperative in that with what is discovered and understood can be published and used to educate the public. This education could assist in th
05.17.10 Using Linguistic Analysis to Understand Transition to College Experiences

Mary Dzindolet, Jeff Seger, Lana Lucas,

Cameron University

Understanding students' transition to college may be useful in increasing retention and graduation rates. The usefulness of linguistic analysis (specifically, the Linguistic Inquiry and Word Count, LIWC) in identifying students who feel high school prepared them for college and those who wish to continue on to graduate school was examined. About 50 Cameron University students enrolled in General Psychology completed a survey and a face-to-face interview concerning their transition to college and their career goals. The transcripts from the interview were submitted to the LIWC. Students who reported that their high school prepared them well for college used more personal pronouns (e.g., I, you, he, she, we, they) than those who reported their high school did not prepare them for college, M-prepared = 12.90, M-not prepared = 11.89. In addition, the older the student, the more words, r(47) = .33, p < .03, and articles, r(47) = .30, p < .04, the student used. Older students were more likely to report that their high school did not prepare them for college, M-prepared = 21.78 years, M-not prepared = 27.20 years. Implications for retention are discussed.

05.17.11 Pre-Recorded Power Statement Usage on Collegiate Male Hockey Athletes

Beau Leaf,

University of Central Oklahoma

Athletes during sport performance encounter stress levels which affect performance outcome. Pre-performance rituals and/or practices vary amongst individual athletes and assist the athlete with their ability to focus during performance. The athletes involved in the current study were members of a team which is a competitive performance club league in the American Collegiate Hockey Association (ACHA). A recording consisting of 40 hockey specific power statements was randomly assigned to 10 members of the team by an independent source and the other 10 members received a recording asking the athlete to continue on their normal pre-practice routine. The athletes were advised to listen to the recording directly before the practice and then were observed. Data was collected on the pass completion/incompletion and goal completion/incompletion pre-treatment on a separate occasion and data collection was repeated after treatment was applied. It was predicted that the completion of goals and passes would increase in those athletes receiving treatment and the results in the athletes not treated would remain the same as in the pre-treated results. Results of the data collected show a significant relationship to the intended result in passing completion and a positive trend in goal completion in the athletes who received the treatment. Results of the athletes not receiving treatment were the same as the intended result, an acute deviation from pre-treatment statistics.
05.17.12 The Relationship between the Big 5 Personality Factors, Locus of Control, and Political Ideology

Antonio Laverghetta, John Geiger,

Cameron University

This study investigated the relationship between personality traits (using the Big Five Inventory), locus of control (using the Rotter scale), and measures of political ideology (using the Social Attitudes Statements scale, SAS-2). Research has shown that the personality trait of openness to experience was negatively correlated with political conservatism using the right wing authoritarianism (RWA) scale as the conservative measure (Peterson et al., 1997). However, there is ongoing debate regarding the nature of political conservatism. Authoritarianism might not be synonymous with conservative beliefs (Crowson, Thoma, & Hestevold, 2005). This calls into question research studies that make the theoretical assumption that political conservatism has components of fascism and/or authoritarianism (e.g. Altemeyer, 1998). We hypothesized that conservative political ideology would be associated with an internal locus of control, while liberal political ideology would be associated with an external locus of control. We administered a questionnaire including a brief demographics survey, SAS-2, the BFI, and the Rotter's Locus of Control scale to a sample of college students attending Cameron University. Results found a positive correlation between political liberalism and external locus of control. We also found that openness to experience was unrelated to conservatism, while agreeableness was correlated with conservatism.

05.17.13 On the Structure of Measurement Noise in Eye-Tracking with Ambiguous Figures

Trey Ridlen, Mickie Vanhoy, Yaser Dorri,

University of Central Oklahoma

Recent and past research has discovered fractal structures within human eye movements (Aks & Sprott, 2003; Aks, Zelinsky, & Sprott, 2002; Stephen & Mirman, 2010; Stephen, Mirman, Magnuson, & Dixon, 2009). However, until recently no research has investigated how the eye-tracking instrument might affect the accuracy of the measurement of eye-tracking variability (Coey, Wallot, Richardson, & Orden, 2012). The results of the study revealed that the structure variability from a fake eye to a real human, displaying that real human eyes have self-similar properties (multifractal structures), whereas fake eyes have random variability (monofractal structures). Fractal patterns are shown in the strong relationship between power (P) and frequency (f) of observed variation in a time-series of measurements. The pattern of variability in the behavior is self-similar and scale-invariant; displaying that large-scale changes occur in relative frequency to small-scale changes. The degree which a dataset approximates the ideal relationship between power and frequency is summarized in the scaling exponent, α. Random fluctuations (i.e. white noise) those associated with the measurement of fake eyes, produce a flat line on the spectral plot. The study proposed is an extension of Coey, et al., 2012 and will show how measurement can affect the measuring of variability of within eye movements, when those measurements are applied with the same data averaging to ambiguous figures.
05.17.14 The Role of Working Memory in Situation Model Construction

John Geiger, Sarah Dailey,

Cameron University

During reading people form a situation model of the events and layout described in the text, which contains both textual information and inferences made by the reader. The style of the text they read often affects how these models are formed (Perrig & Kintsch, 1985; Taylor & Tversky, 1992). These situation models are formed in working memory, so the present study investigated how tying up either Verbal WM or Visuospatial WM affected the model. 141 participants read a route or survey version of a text describing a small town. During reading participants performed either a verbal or spatial secondary task. After reading participants answered 24 true/false questions about the text and drew a map of the town from memory. A 2(Story) x 2(Task) x 2(Question type) x 2(Question version) ANOVA with repeated measures on the last two factors found that locative questions were answered more accurately than inference ones. A Question type x Question version x Story interaction found that when participants read the route version of the text, locative-route questions were answered more accurately than inference-route questions, but there was no difference between locative-survey and inference-survey questions. The opposite was true when participants read a survey text. This finding supported previous findings (Geiger & Millis, 2004) that elaboration and effort during reading leads to increased memory. A 2 (Story) x 2 (Task) ANOVA for the map drawing data was not significant.

05.17.15 Genocide Decoded: A History Lesson to Raise Awareness

Carrie Sanchez,

Northeastern State University

Throughout the ages mass pillaging, rape, and murder has plagued the world. A recent study (CLG, 2013), examines the approaches of studying genocide. Another researcher (Gale, 2005) raises challenges in understanding genocide, and the implications in the dangers of coining acts of violence as genocide. Based on these findings, “Genocide Decoded: A History Lesson to Raise Awareness,” will take an in-depth look into the momentum of genocide and the incitement in international law. This poster will discuss the stages of genocide, historical timelines and comparisons of genocide, and recommended actions individuals can take to help end genocide worldwide.
05.17.16 Participation in Extracurricular Activities and Alcohol Use Throughout the Lifespan

Hunter Holder,

University of Central Oklahoma

The study will investigate how alcohol use patterns in adulthood vary among people that participated in various types of extracurricular activities (i.e., academics, athletics, and fine arts) during high school. This study will use data from Add Health, a 14 year-long longitudinal study using a nationally representative sample of over 16000 adolescents focusing on their physical and psychological health. Previous research has shown that both participation in extra-curricular activities and peer-influence can affect alcohol use and abuse during adolescence (Borden, Donnermeyer, & Scheer, 2001). Research has also shown that age of onset of alcohol use affects life-long alcohol abuse and dependence (Grant & Dawson, 1997). This study is an attempt to build upon these known relationships by determining if these differences in high school persist into adulthood by looking at alcohol use in the fourth wave of Add Health during which participants were in their early 30's. This information will help school districts, community organizations, and their administrators develop and implement more focused primary prevention programs aimed at reducing risky alcohol use among adolescents. These types of programs are important because they can prevent long-term alcohol abuse or dependence problems that stem from adolescent alcohol use, and instill safe and responsible alcohol use habits that could persist into adulthood.

05.17.17 Self-control, displaced aggression and power: Impacts for workplace performance?

Shari Beecher,

University of Central Oklahoma

Recent research has looked at the relationship between self-control and direct aggression involving strangers and intimate partners (DeWall, Finkel & Denson, 2011). Findings show that depletion of self-control should not directly increase aggressive behaviors, but this depletion limits an individual’s ability to override the aggressive urge. The ‘fight’ or ‘flight’ responses of the sympathetic nervous system are engaged during an aggressive threat and research suggests that those high in displaced aggression have an activated ‘flight’ system (Denson, Petersen & Miller, 2006). If those with high-displaced aggression are likely to engage in ‘flight’ they may be likely to run or feel a lack of power to control the situation. Power has been shown in a performance setting, to eliminate the depletion of self-control effect and task performance was unaffected (DeWall, Baumeister, Mead & Vohs, 2011). With sufficient motivation, individuals can perform well even if they are depleted of self-control (Muraven & Slessareva, 2003) and power may be a source of this motivation. It is also predicted that those primed with power will write more words as compared to those not primed with power. Those with the perception of more power do not show a lack in performance and performance of the evaluation task may likely have more words as power is suggested to stimulate generalized executive functioning (DeWall, Baumeister, Mead & Vohs,
Characteristics of Successful Grant Proposals: Findings and Recommendations

Kathryn Schoonover, Arizona Chin,

Northeastern State University

Objective: The objective of this research was to determine attributes of grant proposals and principal investigators that contribute to success in acquiring extramural funding. Methods: We examined archival data in the form of grant proposals that had been successfully awarded and those that were not funded. After examination, we compiled a list of characteristics that distinguished effective proposal development. Results and Conclusion: Findings indicated that successful grant proposals are well organized, carefully constructed with adherence to funder guidelines, and clearly compliant with institutional policy. Proposals that were not funded showed evidence of disorganization and disregard for timely preparation and submission for institutional review. Realistic expectations, understanding of fundability of projects, and experience or training in proposal development appeared lacking among principal investigators-writers of these proposals. One of the implications of these findings is need for emphasis on principal investigator professionalism. We propose training for principal investigators to encourage demonstration of excellent skill in organization, familiarity with their project or program, understanding of the funding source, knowledge of institutional assistance, and compliance with guidelines.

Rebound Effect for Stereotypes Involving Formerly-Convicted Criminals

Sean McMillan,

University of Central Oklahoma

This study is a replication of Macrae et al. (1994). They found a rebound effect, which is when a suppressed thought becomes more frequent than it was before suppression. They found this effect by priming the concept of a skinhead. The purpose of this study is to determine if there will be a rebound effect after priming a violent convict concept. Additionally, if there is a rebound effect, does the picture’s ethnicity (Black or White) influence it? It is hypothesized that there will be a rebound effect, and that the effect will be stronger when the photo’s ethnicity is Black. Participants will view a picture of someone they are told is a formerly convicted criminal. They will then write a day in the life of the convict. Participants will be told that they will interact with the convict from the picture. They will then be led to a room that has one row of seven chairs. The middle chair will have a jacket on it, and participants will be told that it belongs to the former convict. They will be asked to choose a seat and wait for the person to return. The excuse given for the person’s absence will be that he must have gone to the bathroom. The experiment will end once they have chosen their seat, as this will give a measure of social distance from the former convict (a rebound effect). This project is currently awaiting IRB approval, and data collection will begin as soon as approval is received.
Affective Neuroscience: A Perspective on Psychopathology

Heather Coleman,
Northeastern State University

The interdisciplinary field of Affective neuroscience investigates the neural mechanisms of emotion. The integration of the psychological and biological perspective has provided a greater understanding of psychological processes; in particular mental illness. This poster will provide an overview of this emerging field including theoretical approaches, meta-analysis conducted to date, and current methodology of investigation. Also, the contribution of Affective neuroscience research in understanding psychopathology and implications for future study will be discussed. The role of emotion regulation within a psychopathology framework will be emphasized.

Facial Perception and the Human Neural System

Alyssa Hendrex,
Northeastern State University

The face takes a fundamental role in the human social interaction. It provides clues about a person’s characteristics such as age, race, emotion and gender. Investigators utilize a variety of methods to examine how humans perceive faces, from behavioral measures to neuroimage techniques. Empirical studies suggest that faces are processed differently than non-face objects. In addition, recent studies suggest that faces are processed in the brain differently based on the observers age, mental health, gender and familiarity of the faces presented. The proposed poster will present popular methods utilized in face research and discuss findings of recent and past studies. Emphasis will be placed on neural processes involved in facial perception, including social aspects of face processing.
Abstracts from the 2013 Oklahoma Research Day
Held at the University of Central Oklahoma

05. Mathematics and Science

18. Statistics

05.18.01 A Statistical Analysis of the “Fairness” of the NCAA Basketball Tournaments

Minzhe Wu, Tracy Morris,
University of Central Oklahoma

The “fairness” of tournament designs is of crucial importance in competitive sports. For example, in a previous paper, Morris and Bokhari (2012) showed that in certain situations it is more advantageous to be seeded 10, 11, or 12 than 8 or 9. The objective of this research was to examine the “fairness” (meaning higher-ranked teams should perform better, on average, than lower-ranked teams) of the NCAA basketball tournaments relative to other tournament variations, such as reseeding and round robin designs. Data was collected from mcubed.net (http://mcubed.net/ncaa_b) concerning seed and game outcome (win or loss) for both the men’s and women’s tournaments dating back to the beginning of each tournament (1939 for the men’s and 1982 for the women’s). This data was used to develop a model for estimating the probabilities of any given seed beating any other seed. These estimated probabilities were then used to simulate the outcomes of other tournament designs.

05.18.02 Project SCHOLAR: A Student Research Program Involving Service Learning

Candace Baker, Brenden Balch, Cynthia Murray, Kyle Williams, Tracy Morris,
University of Central Oklahoma

Project SCHOLAR consists of a team of faculty and students from various departments in the College of Mathematics and Science. Our objectives are (1) to promote student interest in statistical research through active learning and (2) to provide statistical consulting services to other faculty members and the community at large. Students involved in Project SCHOLAR have an opportunity to work collaboratively with professors and specialists from different areas of research during each project. They work as a team to analyze submitted data using various statistical methods and software under the direction of statistics professors. They also prepare professional written and oral presentations for the researcher that submitted the project. Currently, Project SCHOLAR students are working on five different projects: an assessment of UCO’s developmental math program, an analysis of experimental data concerning the effects of peer mentoring on nurse anesthetist students at Newman University in Wichita, KS, a study of the enrollment trends at UCO, the development of a model to estimate the probability that a given UCO nursing student will complete the program, and an analysis of traffic fatality trends for the Oklahoma Highway Safety Office.
Alleviating Stress in Nursing Students through Peer Mentoring

Brian Gatewood, Alvin Teh, Beth Cochran, Cynthia Murray, Tracy Morris,

University of Central Oklahoma

Project SCHOLAR (Statistical Consulting Help for Organizational Leaders and Academic Researchers) is a student statistical consulting service at the University of Central Oklahoma. SCHOLAR students work under the supervision of faculty from the department of mathematics and statistics on various projects submitted from other researchers from both on and off campus. In 2012, SCHOLAR students were approached by a group of students from Newman University in Wichita, KS to analyze some experimental data concerning the effects of peer mentoring on the stress levels of nurse anesthetist students. A group of nurse anesthetist students were given a survey concerning stress. Following the survey, half of the students participated in a peer mentoring program (experimental group) and half did not (control group). After the peer mentoring program the students repeated the survey concerning stress. The mean scores on six of the twenty items for the experimental group decreased significantly more than the mean scores on the same items for the control group. This indicates that the peer mentoring program may be effective at reducing the stress levels of nurse anesthetist students at Newman University.

A Logistic Regression Model for Predicting the Success of Nursing Students at UCO

Brian Gatewood, Cynthia Murray, Sarah Schatz, Tracy Morris,

University of Central Oklahoma

The nursing program at the University of Central Oklahoma (UCO) has an abundance of students applying for limited slots of enrollment. When the selection process is competitive, it becomes beneficial to both the students and the nursing program to identify those students most likely to complete the program. Members of the Nursing Department conducted a study on enrolled nursing students in an attempt to discover the most important factors for predicting a students likelihood of completing the nursing program. The studied variables included TEAS scores and GPAs. The students were tracked for four years and were grouped according to whether or not they finished the nursing program. Using logistic regression we were able to construct a formula to predict the probability of a student completing the program based on these variables. This work was completed by Project SCHOLAR (Statistical Consulting Help for Organizational Leaders and Academic Researchers) students. SCHOLAR is an interdisciplinary student statistical consulting service at UCO. SCHOLAR students work collaboratively under the supervision of faculty from the Department of Mathematics and Statistics on various projects submitted from other researchers on campus and organizations in the community.
It’s fourth down and two yards to go. The ball is on your own 40 yard line. Do you go for the first down or punt? Coaches have to consider so many factors when making this decision, and must do so in a matter of seconds. Consequently, coaches tend to make the conservative decision to punt. In this research, data was collected from www.cfbstats.com concerning all fourth downs during the 2011 college football season. Only fourth downs for which the ball was either passed or rushed were included in the data set. Logistic regression was used to construct a model for estimating the probability of converting a fourth down based on a variety of variables including yards to go, score, home or away, and quarter.
05.19.01 Mesocarnivore mammals in the Mountain Pine Ridge of Belize: Report from a camera trap survey in 2010

Erik Terdal, Ronaldi Martinez,
Northeastern State University

We present results of a camera-trap survey of mammals in the mesocarnivore guild in the Mountain Pine Ridge area of the Maya Mountains in the Cayo District of Belize, Central America. This is largely a tropical pine savanna habitat managed for commercial timber production. Our research purpose is to determine which mammalian mesocarnivore species use managed tropical pine forest as habitat. Mesocarnivores receive less attention in tropical forests than do large felids such as jaguar (Panthera onca) and puma (Puma concolor) but may be of at least comparable ecological significance if their relative abundance is high. Little information is available on relative abundance of mesocarnivores in tropical pine forests. We present the first comprehensive camera-trap survey of mesocarnivores in a commercially logged tropical pine forest. We placed camera traps at 15 sites approximately three km apart in a loose grid covering ~40000 hectares. Camera traps consisted of pairs of motion-activated digital cameras on opposite sides of logging roads. We examined images of 1520 mammals taken between 18 January 2010 and 11 January 2011. The mammal fauna recognizable in the images encompassed 7 orders, 13 families, 21+ genera and 23+ species. Large carnivores included jaguar and puma. Potential mammalian prey for mesocarnivores included several species of rodents and marsupials. The most commonly photographed mammal was the grey fox (Urocyon cinereoargenteus), at 78% of the mammal total. We exa
Effects of Blood Sampling on Nestling Scissor-tailed Flycatchers
(Tyrannus forficatus)

Michael Husak, Diane Landoll,
Cameron University

Increases in the ease and efficiency of genetic work in birds using minimally invasive techniques, such as small blood samples, has opened the potential to ask a broad range of questions. Blood sampling among adult and nestling birds has increased dramatically over the last 20 years. While sampling protocols are well researched and monitored, there remain questions regarding the effects of blood sampling on survival and development in nestlings, especially in systems in which depredation rates are high. We compared survival and rates of development in nestling Scissor-tailed Flycatchers (Tyrannus forficatus) in southwestern Oklahoma. From 2008 through 2012 we collected 25-μl blood samples from a total of 291 nestlings from 80 nests while addressing patterns of extra-pair paternity. Obtaining blood samples from nestlings did not significantly affect rates of predation, abandonment, or development compared to control nests which were monitored in the same manner, but from which blood was not collected.

Strength of the Femur and Humeri of Oklahoma Turtles (Order Testudines) Indicated from Structural Analysis of the Bisected Bones

Jessica Steudeman,
East Central University

Upper long bones of turtles were examined to determine comparative strength to withstand stresses placed on the limbs by added weight of the shell (carapace and plastron) to organism mass. Femora and humeri were extracted from 59 turtles collected within Oklahoma. Extracted bones were measured for: total bone length, short diameter, long diameter, short anterior bone collar, short posterior bone collar, long ventral bone collar, and long dorsal bone collar. Measurements were used to calculate the short and long KR values, short and long K values, and the R/t value for each bone collar. KR is radius of the marrow cavity. K is ratio of outer bone collar diameter compared to inner marrow cavity diameter. R/t is ratio of total radius compared to the thickness of the bone collar. Data was used to determine variation in strength within different turtle species and other vertebrates. Differences in K and R/t values were found between terrestrial turtles and aquatic turtles as well as other vertebrates. Significant differences occurred in thickness of opposing sides of the bone collar. Differences reflect stress points on limbs as it is held in a horizontal position for walking. Dorsal and anterior aspects of the bones require more strength, and therefore have thicker bone collars, while the ventral and posterior aspects require less strength and more flexibility. Data suggests shell weight causes remodeling of bone collars to carry increased mass induced by the shell while on land.
A Morphometric Investigation of Possible Hybridization in Sympatric Regions between Terrapene carolina triunguis and Terrapene ornata ornata

Timothy Steudeman, Kenneth Andrews,

East Central University

The box turtles Terrapene carolina triunguis and Terrapene ornata ornata are sympatric in regions of Oklahoma. It has been proposed by multiple authors that these two species interbreed. Morphometric measurements were extracted from six hundred and ninety-five box turtles in field and museum collections to determine if interbreeding exist between these two sympatric species. The shell measurements extracted were: Length of Plastron, Humeral, Internal Seam, height of the shell, and length and widths of cervical 1, 2, 3, anterior lobe, posterior lobe, and carapace. Measurements where analyzed to determine a possible hybridization between the species Terrapene c. triunguis and Terrapene ornata. Statistical analysis software was used to determine correlations between specimens of a known species and those of possible hybridization. Baseline statistics were utilized to determine variation within these structures and T tests will be performed on the averages to determine if there are any significant differences between the average meristic values of the structures. Once these variances are determined, then Discriminant Function Analysis (DFA), Principal Components Analysis (PCA), and Cluster Analysis (CA) will be used to determine if these variations have hybrid specimens with intermediate values. Preliminary analysis suggests that cervical length would be of use in determining interbreeding.

Responses to Femoral Gland Secretions in Primarily Visually Signaling Collared Lizards

Abigail McGee, Anthony Lunsford, Troy Baird,

University of Central Oklahoma

Although they have highly developed visual signaling, male collared lizards (Crotaphytus collaris) produce secretions from femoral glands, and occasionally lick the substrate, apparently to sample the secretions. We conducted laboratory experiments to address whether C. collaris differentiates femoral gland secretions from control substances (odiferous, neutral), and the extent to which males and females differentiate secretions from different male donors. We recorded the number of licks on his own secretions, secretions from the subject male, secretions from a rival male, cologne, and water, each applied to one of four dishes positioned equidistant from a central release box in random locations. Females were presented with secretions from the male owner of the territory that overlapped her, secretions from a male whose territory was distant from her home range, cologne, and water. Thus far, results show that both sexes tended to respond more to the odiferous control and femoral gland secretions. Males licked secretions from rival males more, whereas females licked the odiferous control and familiar male secretions more. Results suggest that collared lizards respond to secretions and a scented control, suggesting that chemical cues may function in intra- and intersexual signaling, in addition to this species’ highly developed visual communication.
05.19.06  Migratory Connectivity in Yellow Rails and Le Conte’s Sparrows  
Chris Butler,  
University of Central Oklahoma

The objective of this project was to determine the breeding grounds of two poorly-studied bird species: Yellow Rail (Coturnicops noveboracensis) and Le Conte’s Sparrow (Ammodramus leconteii). Both species were banded at Red Slough Wildlife Management Area in McCurtain County, Oklahoma during November through March. Yellow Rails were banded from 2008 – 2013, while Le Conte’s Sparrows were banded from 2010 – 2013. Preliminary deuterium analyses on feathers collected from Yellow Rails suggests that Yellow Rails wintering in Oklahoma are breeding primarily in the western half of their range. Preliminary deuterium analyses on feathers conducted on Le Conte’s Sparrows likewise suggest that they are breeding in the western half of their range. However, the deuterium values obtained for Le Conte’s Sparrows show less variation than feathers collected from Yellow Rails. This suggests that Le Conte’s Sparrows have relatively strong migratory connectivity while Yellow Rails have moderate connectivity.

05.19.07  The Effect of Habitat Area on Species Richness: Aquatic Macroinvertebrate Assemblages in the Peloncillo Mountains  
Jeremy Massengill, Paul Stone,  
University of Central Oklahoma

Aquatic habitats exist along a size gradient ranging from small temporary pools to large intermittent tanks. These habitats are characterized by stochastic events, environmental factors, and biotic interactions. We conducted research in the Peloncillo Mountains, Hidalgo Co., New Mexico. The Peloncillo Mountains are characterized by an intertwining network of canyons, seasonal monsoons and periodic drought. Aquatic macroinvertebrate assemblages occur in aquatic habitats along a size gradient and are potentially impacted by environmental and biological factors associated with these habitats. A focused effort at data collection of aquatic macroinvertebrate assemblages in pools and tanks that vary in size may clarify unknown aspects of this study area. This will allow testing of the theory of island biogeography which predicts species richness should be highest in large aquatic habitats and lowest in small aquatic habitats. Using collection data from May 2012, five randomly selected ephemeral pools and five randomly selected intermittent tanks, from three distinct drainages, were compared to see if species richness varied along the size gradient. Species richness was not higher in larger intermittent tanks compared to smaller ephemeral pools. Also, the linear regression of pool size vs. species richness was not significant in the positive direction. This is different from what is predicted by the theory of island biogeography and we will address possible reasons for this outcome.
05.19.08  Deuterium Stable Isotope Analysis on Wintering Black Rails of Texas

Jeffrey Tibbits, Charles Brower, Chris Butler, Jeffrey Kelly, Jennifer Wilson,
University of Central Oklahoma

The Black Rail (Laterallus jamaicensis) is the smallest of the North American rails and one of the most secretive species on the continent. Birds breeding along the Gulf Coast and along the southeastern Atlantic coast are presumed to be year-round residents, but nothing is known about where interior birds winter. To date, 556 Black Rails have been banded but there has only been a single recovery. Another approach to studying bird movements is to use stable isotope analysis. Isotopic ratios vary spatially, and the tissues in an organism reflect these local isotopic ratios. Since Black Rails molt rectrices (tail feathers) shortly after breeding, the isotopic ratios in these metabolically inert feathers should reflect the isotopic ratios of the breeding grounds. The goal of this project was to determine the relative proportion of inland to coastal Black Rails wintering in Texas. Nine Black Rails were banded at San Bernard NWR between November 2009 and April 2010. A single rectrix (tail feather) was removed from each individual and subjected to a deuterium stable analysis. Three of the nine birds had deuterium values consistent with coastal Texas, indicating that they were residents. The remaining six birds had deuterium values consistent with inland North America, indicating that they were non-residents. The results of this study suggest that many of the Black Rails wintering along the Texas coast breed in the interior of North America.

05.19.09  Determining the breeding grounds of Henslow’s Sparrows using stable isotope analysis

Katrina Hucks, Chris Butler,
University of Central Oklahoma

Henslow’s Sparrows (Ammodramus henslowii) are a declining grassland bird species. Although the decline in this species is presumably due to habitat loss, it is unclear whether this decline is being driven by habitat loss on the wintering grounds, breeding grounds or in both areas. It is important to determine whether wintering birds bred in a wide geographic area or a relatively narrow zone in order to manage for this species. Our goal was to determine the breeding location of Henslow’s Sparrows wintering along the Gulf coast. During 14 – 21 December 2012, we searched for Henslow’s Sparrows in Louisiana, Mississippi, and Florida. Birds were flushed using a rope-dragging technique and were caught in hand-held nets. A partial secondary feather was taken from each sparrow for a deuterium stable isotope analysis and the bird was then released. We were unsuccessful at banding Henslow’s Sparrows at two locations in southeastern Louisiana, but banded five Henslow’s Sparrows at Mississippi Sandhill Crane National Wildlife Refuge in Gautier, Mississippi as well as a single bird at Kissimmee Prairie Preserve State Park, FL. The feathers are currently being prepared for a deuterium stable isotope analysis.
05.19.10 Mapping the Winter Distribution of the Eastern Whip-poor-will

Britney Temple, Chris Butler,

University of Central Oklahoma

The Eastern Whip-poor-will, (Antrostomus vociferus), is declining at a rate of 2.6% annually. The objective of this study is to model the winter distribution of the Eastern Whip-poor-will and examine how the range may shift under different climate change scenarios. We obtained the locality data from ORNIS and Christmas Bird Counts, for the months December, January, and February. Twenty ecogeographical variables were obtained from WorldClim. Maxent was used to model the distribution of this species. The models show that the winter range is far smaller than the breeding range, with the greatest concentration of highly suitable habitat during winter is in Florida. This suggests that habitat destruction in Florida may have a disproportionate effect on the population of Eastern Whip-poor-wills. In addition, the models suggest that climate change may negatively impact this species.

05.19.11 Modeling the Hybrid Zone for Black-chinned and Ruby-throated Hummingbirds

Lindsay Jones, Chris Butler, Daniel Whalen,

University of Central Oklahoma

Black-chinned Hummingbirds (Archilochus alexandri) and Ruby-throated Hummingbirds (A. colubris) hybridize in Oklahoma and Texas. The extent of the hybrid zone has not previously been described and the goal of our study was to describe the spatial extent of the hybrid zone and project how the zone may change under different climate change scenarios. Locality data for breeding Black-chinned Hummingbirds and Ruby-throated Hummingbirds was obtained from ORNIS, while locality data for hybrids was obtained from a literature review. Bioclimatic variables for the model were obtained from WorldClim. We used Maxent to model the extent of the hybrid zone. The hybrid zone is currently restricted to the southern Great Plains. Under all three climate change scenarios considered, the hybrid zone remained centered in the southern Great Plains, with a moderate northward shift. These results suggest that, although climate change may affect the distribution of each hummingbird species, the zone of overlap is expected to remain largely static.
Despite more than 250 years of biodiversity research and the enormous societal relevance of bees, a significant amount of work remains to be done to fully understand their evolutionary history and diversity, as well as to achieve actual conservation and sustainability goals. Even in areas where the bee fauna has been relatively well extensively studied such as North America, biological information is still limited to a few common species, others are known from a single sex, many are new to science, and traditional identification guides are often outdated or nonexistent. Furthermore, the species status of the vast majority has never been tested since they were proposed by earlier scientists based upon obsolete unspecified or non-existent species concepts and limited morphological knowledge due to the scientific equipment available at the time. This means that not only have we entered the 21st century with old, untested hypotheses, but also that potentially useful morphological characters remain to be explored and analyzed. We highlight the urgent societal need for species-level systematic work, particularly emphasized by the recent concerns about population declines of both managed and unmanaged bees, and the urge to assess the status of pollinators and pollination services. We also draw attention to the wealth of exciting research and collaboration opportunities that can be developed today while addressing such a need.
Participants in the 2013 Oklahoma Research Day
Held at the University of Central Oklahoma

Abbott, Matt, Southwestern Oklahoma State University
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Abia, Jude, Northeastern State University
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