

Education is
not the filling
of a pail, but
the lighting
of a fire.

William Butler Yeats



TRUMAN STATE UNIVERSITY 11TH ANNUAL
UNDERGRADUATE RESEARCH SYMPOSIUM

ABSTRACTS

MARCH 20, 1998 · STUDENT UNION · 8 A. M. - 6 P. M.

Phi Kappa Phi Honor Society

Interdisciplinary Section

Manifestations of Tuberculosis in John Keats' "Ode on a Grecian Urn"

Marya Lucas
Dr. Cole Woodcox, Faculty Mentor

As a poet, physician and victim of Tuberculosis, John Keats (1795-1821) maintained a vision that few people attain in their lives. As a physician, Keats gained great perceptive skills, for he could read the outside signs of disease and understand its source. However, Keats was unable to place absolute faith in the study of medicine, so he pursued poetry instead.

In poetry, Keats combined his intuitive feelings and physician-like perceptiveness, understanding the emotional and physical being. This understanding was to prove detrimental to Keats after he contracted Tuberculosis in 1818, for he could read the signs of the disease and see its course, but he could do nothing to stop it. Keats was afflicted by his depth of knowledge and his overly conscious self. Within his poem, "Ode on a Grecian Urn," written in 1819, a year after Keats contracted Tuberculosis, he reveals many symptoms of his disease.

Islamic Art and Symmetry Groups

Christy Redenbaugh
Dr. Todd Hammond, Faculty Mentor

We utilized the seventeen mathematical planar groups of symmetry to classify repetitive patterns in Islamic art, particularly interlacing patterns. Interlacing patterns are one of the trademarks of Islamic art. Although the nature of interlacing patterns seems complex, Mathematician Branko Grunbaum has proposed that most of the interlaces in interlacing patterns are formed by strands of a small number of distinct shapes. He suggests that many of the Islamic interlace patterns were constructed by stencils. Therefore, the mystery of how elaborate interlace patterns were designed can be explained. We studied interlace patterns in an attempt to prove theorems about the symmetry of Islamic interlacing patterns. Some of the patterns we discovered contradicted Grunbaum's propositions. With such discrepant patterns, it appears that the symmetries within the patterns were calculated and deliberate. The mathematical properties of patterns from various symmetry groups were explored in an attempt to prove Grunbaum's propositions.

Prototype Theory and Cognitive Linguistics: A Literature Review.

Shannon Ross, Daniel Baack
Dr. Mary Shapiro, Faculty Mentor

Why do people categorize both Tic-Tac Toe and Monopoly as games? Why do people label many different shades of color as the single color red? In the last twenty-five years, cognitive linguistics has grown to be an important sub-field of mainstream linguistics and cognitive psychology, and new insights into the way perception, memory, environment, and language interact to categorize has been one of the most significant contributions. Since antiquity, Aristotle and a classical approach have dominated language categorization, but in the early seventies an experimental approach was applied to the question and prototype theory emerged contradicting Aristotle and tradition. This presentation will explore the history of the prototype theory and language categorization, and then discuss the theory's impact on both linguistics and psychology.

Rebalancing Nature: An Overview of the Development of Bioremediation

Mark Wissel
Dr. Philip Wilson, Faculty Mentor

Bioremediation refers to environmental pollutant cleanup using living organisms. Making its major public appearance in the form of oil-eating bacteria following the 1989 Exxon oil spill, bioremediation promises cost-effectiveness in many cleanup operations. This project traces the conceptual development of bioremediation from the early 1970's and explores ways in which the usage of both the term and the science have grown. The social concerns surrounding the proliferation of this "green" approach in the last 25 years is examined through the media involvement, especially following the Exxon Valdez accident. National and global political issues are also investigated. A political background summary is drawn through an analysis of Environmental Protection Agency action, specific legislation, and viewpoints of scientists who have fostered bioremediation's growth. Policy decisions concerning its use in Europe and Japan are discussed. Major technological breakthroughs significant to bioremediation are addressed along with a synopsis of bioremediation's current applications.

Business & Accountancy

Give 'Till It Hurts

Keri Anson*, Regina Franke, Jackie Graham*, Catherine Stanley, Amy Theel, and Jennifer Watrous*
Dr. Val Larsen, Faculty Mentor

While a nonprofit organization is not considered a typical business there are many striking similarities with traditional companies. These types of organizations use business and marketing strategies to stay afloat just as any other typical company would. In our research we explored the complexities of the donor-client relationship and how nonprofit organizations motivate these individuals to donate to their cause. We tested how the amount of recognition to a donor influences their willingness to give to nonprofit organizations. In a second survey we tested how the perceived competence of the organization based on the clothing attire of its president affected donations. In a similar survey we tested the willingness of individuals to donate to the organization based on the amount of overhead incurred by the organization.

Is the Two-Factor Theory Universal?: An Application to Students' Motivation.

Sean Crider
Dr. Pyung Han, Faculty Mentor

The two-factor theory has been one of the most controversial theories of motivation. However, the impact of the theory on workers' motivation should not be underestimated. From a scientific vantage point, applying the theory to students' motivation in college classes seemed feasible. The purpose of this research was to determine how applicable Herzberg's two-factor theory is to students. A survey study was employed to collect data from 90 Truman State University students in upper level business classes. Based on the results of the data analysis, some practical suggestions for student motivation were discussed.

Ethics on the Information Superhighway

Stephanie Douthitt
Dr. Nabil Alghalith, Faculty Mentor

Ethics is an issue that has gained popularity in recent times and it can be applied to all areas of life. However the advent of information systems, and especially the internet, has created a wave of concern among the ethically-oriented. Ethical problems concerning the

internet are not isolated to the United States. This is an international issue. With technology improving at a phenomenal rate, several key areas have been targeted namely those of Privacy, Accuracy, Property, and Accessibility (PAPA). It is important to remember that the ethics of everyday life also apply to information systems. Countless organizations have attempted to establish ethical ideals in response to this technological growth. One organization has composed The Ten Commandments of Computer Ethics, and others have tried similar proclamations, but the best approach has seemed to be one of "preventative maintenance."

Share Repurchases Programs: Examining a Positive Trend

George I. Kruntchev and Alexander M. Petrovic III
Dr. Jason Lin, Faculty Mentor

The recent surge in corporate buyback announcements have spawned great debate over their marketwide influence and has once again brought into question the motivations for management implementing stock buyback programs. For our investigation into the matter, we will first examine the volume and other related statistics of these programs in recent years. Next, we will look at how share repurchases are actually executed, and the issues attached to the act. The motivations for stock buybacks will be analyzed next with special emphasis placed on signals to investors, increasing shareholder wealth, and acquiring shares for employee stock options. Finally, we will provide our own personal conclusions regarding the effective use of repurchase programs for corporations specifically and for the market.

Education

HyperStudio: Teaching Building Classroom Discipline With Multimedia Software

Jason Davey
Dr. Janice Grow, Faculty, Mentor

The outcome of the research is a multimedia (MM) computer based presentation designed to supplement an instructor's presentation of Building Classroom Discipline by C.M. Charles. The research is based on the idea that people have markedly different learning styles. The research assumes that because more channels (i.e. audio, video) are being used, a greater number of students will become more intimately involved with the presentation than students in a non-MM format. The research further assumes that MM students will have higher rates of initial comprehension and retention than those taught without multimedia classroom aids.

The creation of the presentation aid was done on HyperStudio version 3.0. The research presents different models for a classroom in order to explain the function of the models of classroom management outlined in the textbook. To date, the effectiveness of the presentation on initial comprehension and retention has not been measured.

Note: This research is the outcome of the undergraduate research stipend program and was started in the summer of 1997. Presenting in this conference is a requirement for the program.

Fine Arts

The Theatrical, Scientific, and Religious Evolution of Medieval Liturgical Drama in England

William Bequette
Dr. Lee Orchard, Faculty Mentor

The main driving force of theatre, and especially theatrical stagecraft in medieval England, was the Catholic Church. Religion was at the roots of all drama which originated out of Medieval England. The drama primarily rose out of the celebration of the Catholic Mass and of the celebration of the Corpus Christi. Early stagecraft started to form in the Mass, but the church was a very limited space and had many strict rules. Drama and stagecraft, being dynamic, started to form a new combination of religion and secularized ideas and was moved from the Churches onto the town streets. It was in the town streets that the religious dramatic stagecraft mad some of the greatest and practical advancements in the history of science and theatre, much of which, is still used today.

The Development of Iron and Glass Buildings During the Industrial Revolution

Michelle Correll
Dr. Julia DeLancey, Dr. Sara Orel, Dr. John Ramsbottom,
Dr. John Siewert, Faculty Mentors:

Skyscrapers developed their roots through the idea of iron and glass multi-story framing during the Industrial Revolution. Europeans learned to integrate interior and exterior space during the Industrial Revolution through a series of iron and glass buildings produced during this period. Buildings which were important to this development included greenhouses, iron and glass roof enclosures, and exhibit halls. One structure which was crucial to the evolution of iron and glass structures was the Bibliotheque Nationale in Paris. Constructed with gridiron floors and a glass wall between the reading room and book stacks, the Bibliotheque Nationale permitted light to penetrate to all areas of these rooms. This type of interpenetration can now be see in buildings with skywalks, glass-enclosed stairwells, and public atria.

A Catalyst for Change: American Modern Art After the Armory Show

Aimee B. Couste
Dr. Julia DeLancey, Dr. Sara Orel, and Dr. John Siewert,
Faculty Mentors

The artistic community in America at the beginning of the 20th century had not progressed as rapidly as social and economic spheres of society. Few opportunities existed for artists outside the National Academy of Design. In 1913, the Association of American Painters and Sculptors sponsored an exhibition at the 69th Armory in New York. This exhibition introduced the American public to European and American modern art. The reaction of the public and press to the exhibition ranged from tremendous praise to sometimes violent disapproval. Despite the negative reactions, the Armory Show expanded opportunities for a variety of artists that previously had no outlet. The increased patronage and exhibition possibilities allowed for a diverse selection of artistic styles, therefore paving the way for the modern period of art in America. This presentation will focus on these reactions and how they influenced the course of American modern art.

Modernism in America: An Examination of Private Galleries and Exhibitions in New York City in the 1920s

Katherine L. Cumming
Dr. Sara Orel, Dr. Julia DeLancey, and Dr. John Siewert,
Faculty Mentors

The 1920s was a dynamic decade for America and a unique period in American art as well. In New York City, it was a time of increasing enthusiasm for European and modern art. Private galleries and their exhibitions during the 1920s in New York City changed the course of modern American art by promoting abstract art and European modernism. This study seeks to understand the way in which galleries in New York City shaped the future of modern American art. One of these galleries was the Societe Anonyme, Inc., headed by artist and writer Katherine Dreier. This presentation focuses on the work of this innovative woman. More specifically, it will examine her philosophy, and a case study of one show in particular: The Brooklyn Exhibition of November 18, 1926.

The French Impact on Swedish Palaces of the Baroque Era

Rachelle Foster
Dr. Julia DeLancey, Dr. Sara Orel, and Dr. John Siewert,
Faculty Mentors

From the second half of the seventeenth century through the eighteenth century, a unique cultural exchange existed between France and Sweden. During this period, Sweden emerged as a major Baltic Power and evolved into an absolute monarchy. Consequently, the Swedish monarchy desired royal residences that would reflect their new power. They looked to France, particularly Versailles, for inspiration, as it was viewed to be the ultimate symbol of royal control over culture and politics. The Swedish monarchy sent several representatives to France to study Versailles and French palaces. These representatives established contacts with major French artists, obtained numerous designs of any and all things related to Versailles, and even solicited French artisans to work in Sweden. Using one of the Swedish palaces built during this era as a case study, the extent of the impact of these trips on Swedish palaces becomes evident.

Factoring Society into Art Nouveau

Becky Frantonius
Dr. Julia DeLancey, Dr. Sara Orel and Dr. John Siewert,
Faculty Mentors

Art Nouveau architecture was a unique evolution of many different factors of the nineteenth century, such as industrialism, class systems, drastic population growth, and changing art movements. Art Nouveau, a universal style, was interpreted differently according to each culture, but always represented the people it was created for.

This presentation will focus on Victor Horta and his work in Brussels, called the Tassel House. His unification of materials within the design and structure of the house create a building that thoroughly describes the visual complexities of the movement. Horta's goal was to understand the people that he built for, and describe them through architectural forms. Art Nouveau was a culmination of the society and atmosphere of the 1890s. Horta's ability to unify man with art exemplifies this connection.

Russian Influence versus the West: An Examination of Natalia Goncharova's 1910 painting, Haycutting

Terri Ann Fredrick
Dr. Julia DeLancey, Faculty Mentor

Beginning in 1906, Russian painter Natalia Goncharova's work began to exhibit less influence from the French Impressionists, and instead moved into a period of strong Nationalism, in which she looked to Russian folk and religious art for inspiration. She wrote several essays claiming that the West had no longer had anything of value to offer Russian artists. However, within five years of making these statements, Goncharova immigrated permanently to France. Since that time, critics have disagreed on the role in which art from the West continued to influence Goncharova after her purported break. This presentation will analyze the question of influence in Goncharova's work through the specific example of her 1910 painting, Haycutting.

Musical Masterworks of Second Half of the Twentieth Century: Toward a Canon of "New Music"

Matthew A. Groves
Dr. Warren Gooch, Faculty Mentor

The field of concert music has undergone radical changes in the past fifty years. Never before in the history of art music has such aesthetic diversity existed within so short a time, and never before in music history has there been less agreement regarding the "direction" which music will take in the future. This project briefly examines elements of this artistic "crisis" by describing some of the major stylistic genres and aesthetic positions that have emerged since 1950. These include post-twelve-tone serialism, aleatorism, electronic music, and minimalism, among others. Compositions that could be considered masterworks in these stylistic genres are discussed en route to the development of a rudimentary "canon" of pieces that would be considered essential to an understanding of our musical era. Significant composers who have greatly influenced musical thought and direction within the given time frame are also discussed.

Mythology From Politics: A Theatre History Study Of Friedrich Schiller's Wilhelm Tell

Paul Gutting
Dr. John Schmor, Faculty Mentor

Every theatre production is both a cultural artifact and a reflection of the meaning of culture for its audience. Subtext and theatrical-staging metaphors determine meaning beyond the rhetoric and poetry of dramatic text, and shift over time according to local cultural concerns. Productions have the potential to reflect cultural views quite different from those held when the play was written. Friedrich Schiller's play Wilhelm Tell affords an excellent opportunity for the study of this effect. This play has been interpreted variously as a politically charged proletariat revolution; a criticism of a small minded proletariat unable to support a revolution; and as something in between, a push to revolt against tyranny and a simultaneous reminder to remain faithful to a larger social structure.

The Yurodivy: Shostakovich, Stalin and the Soviet Patronage System

John A. Kreicbergs
Dr. David Nichols, Faculty Mentor

With few exceptions, Dimitri Shostakovich showed a great deal of resentment towards traditional patronage practices. However, the Soviet government made every attempt to control and influence his stylistic tendencies and compositional approach. The musical aesthetic of the time was that Soviet/Bolshevik ideals should be heralded, such as collectivism, praise for the proletariat, and an image of the new Russia making bold technological and cultural advances into the future. As a result of his high regard for the Russian people and the tyrannical nature of governmental control over art, many came to see Shostakovich as a yurodivy, one who offers social and political criticism veiled in innocence and jest; by outlining Soviet musical aesthetic principles as well as Shostakovich's own views on aesthetics. Examining the Soviet patronage system, and also classifying Shostakovich's works, the researcher will show that Shostakovich was obviously a gifted composer of unfailing integrity.

Structural Connection Between Human and God

Laura C. Krom
Dr. Julia DeLancey, Faculty Mentor

The Sumerians' designs of ziggurats in Mesopotamia reflect the physical and symbolic connection between human and god. In addition to the architectural aspects, ancient literature provides references to the significance of the ziggurat. Mesopotamian myths reveal and define the difference between humans and gods. They tell of the Sumerian origin from the mountains and explain how elevation was vital to communicating with and serving the gods. This presentation explains how Mesopotamian myths support the claim that Sumerian ziggurat designs developed as a reflection of the mountains and a connection to the religious worlds.

"A House Divided": Probing the Mind of the Musical Composer

Natalie R. Levine
Dr. Warren Gooch, Faculty Mentor

The "mind of the musical composer" is generally a mysterious landscape to the non-composer. What stimulates the creative process? How does a composer see a musical work through to completion? What concerns does a composer have about "marketing" his/her work, and about gaining performances, recognition, and publication for his/her product? What aesthetic issues concern, even distress, a composer? As composers are individuals, responses to the above items will vary from composer to composer. What "common ground", if any, may be ascertained in these matters? The best way to attack the latter question is to go directly to the source: What do living, working composers have to say? This project involves the examination of attitudes and opinions of contemporary composers of concert music, as expressed via dialogue on the Society of Composers internet talk line. Topics of discussion include aesthetics, style vs. content in contemporary music, the impact of MIDI technology on composition, establishing a career as an entry-level composer, John Cage: visionary or charlatan, and others. Through a study of dialogue on these and various related topics, an initial sense of how the composer's mind "works" can be gained.

Turner: The Businessman and Artist

Allyson Ryan
Dr. Julia DeLancey, Dr. Sara Orel, Dr. John Siewert,
Faculty Mentors

Joseph Mallord William Turner, the nineteenth-century English painter, used successful business tactics to earn a fortune. By reviewing multiple aspects of an artists life, one can gain a greater insight into his or her art and also into the art world of the time. Turner, an innovative and skilled artist of the nineteenth-century, succeeded in the art world by using his business skills.

In this presentation a brief overview of the of nineteenth century art world and of Turner's life will set the stage for a look at his patrons and his commissioned works. By examining his works and the relationships he had with his patrons the successful business side of Turner's life will become apparent.

Harmonic Foreshadowing and Motivic Unity in Schubert's Piano Sonata in A Major (D.959)

David W. Seabaugh
Dr. Warren Gooch, Faculty Mentor

The great composers of concert music display a distinct genius for generating, in their works, contextual ambiguity which eventually resolves in logical and aesthetically satisfying ways, thus facilitating a newness of expression. The first movement of Franz Schubert's Piano Sonata in A Major (D.959) provides an excellent example. An uncommon chord progression at the close of the movement is systematically foreshadowed throughout the movement. While locally ambiguous, the final statement of this progression is ultimately highly conclusive. A unifying two-chord voice leading motive plays a central role in this process of foreshadowing and resolution. Through the use of musical macro analysis, it is possible to map out the areas of foreshadowing and display them in an orderly manner. Adaptations to the analytical system facilitate the illustration of voice leading and harmonic functions, and allow for a thorough study of the local inner workings of the sonata movement while in turn providing a clear, comprehensive view of the movement as a whole.

Human Potential & Performance

Groups of Order Less than or Equal to 12: Their Properties, Representations, and Character Tables

Amy Auer
Dr. Deborah Denvir, Faculty Mentor

When studying groups in mathematics, it is helpful to have a way of organizing the information into a complete picture. The character table is useful in that it gives the generators, elements of a conjugacy class, and all of the irreducible representations of the group in one complete table. In this presentation we will look at the dihedral groups of orders eight, ten, and twelve and their character tables. The other groups of finite order discussed in my paper include some of the cyclic groups, the cross products of the cyclic groups, the quaternion group, the alternating group, and a group W of order 12.

Are Students and Professors World Apart ?

Chris Auer, Melissa Seifert & Elizabeth Karstens
Dr. Ranjita Misra, Faculty Mentor

This study examined professors' perceptions of students' time management practices, and differences between student and faculty perceptions of students' time management practices. Macan's Time Management Behavior Questionnaire was administered to measure the extent to which time management behaviors were used among students. The instrument was modified to get the faculty perceptions of student's time management behaviors. The sample consisted of 249 students and 67 faculty members at Truman State University. A significant difference existed between students and faculty's perception of students' time management practices ($p < 0.001$). Students indicated more frequent use of time management practices than what faculty members perceived. Female students indicated more frequent use of time management behaviors on all of the four subscales than male students. This difference was statistically significant for perceived control of time, setting goals, and mechanics of time management but not for preference of disorganization in the work space and approach to projects. Implications of the results for counselor and instructors are discussed.

Mommy, why did you drink?

Lakisha Blue, Kristin Virag
Dr. Ranjita Misra, Faculty Mentor

The purpose of this research was to determine the factors that influence drinking during pregnancy. Specifically, we looked at marital status, education, cigarette smoking, age, ethnicity, and alcohol consumption during pregnancy. The data was obtained from the Pregnancy Nutrition Surveillance System in Missouri. Sample size included three thousand five hundred pregnant women who received prenatal care from the health department. Results indicated that the majority of the respondents were married Caucasians, did not smoke or drink, and had a high school education level or less. The mean age of the mother was twenty-two years ($sd=5.38$). Pearson's correlation indicated that drinking during pregnancy was only correlated to marital status. A higher percent of unmarried women reported consuming alcohol during pregnancy than married women. This difference was statistically significant ($p=0.005$).

Tobacco Use at Truman State University

Kurt Bormann and Kathy Hechst
Dr. James Padfield, Faculty Mentor

Tobacco use has been linked to increased rates of cardiovascular disease, hypertension, and various forms of cancer. An anonymous questionnaire administered to Truman State University students enrolled in HLTH 194 indicated that 19.3% of the male students and 14.7% of the female students smoked at least one tobacco cigarette per day. No female students reported using chewing tobacco, but 6.5% of male students used chewing tobacco at least once each day. Smoking was associated with increased consumption of alcohol ($r=.25$; $p<.001$), as well as increased use of marijuana ($r=.23$; $p<.001$) and other illegal drugs ($r=.23$; $p<.001$). Smokers also reported higher levels of self-perceived stress from family troubles ($r=.24$; $p<.001$) and loneliness ($r=.26$; $p<.001$). These results indicate that tobacco use at Truman State University is lower than the national average, but remains a notable health risk.

Relationship of Isokinetic Testing and Functional Testing for the Assessment of Lower Extremity Capability

Kelli Brady
Dr. Michael Bird, Faculty Mentor

The purpose of this study was to examine the relationship between isokinetic knee concentric muscular testing and selected functional tests for reconstructed and rehabilitated knees. Seven college

students were recruited to participate, each having undergone ACL surgical repair for one knee and completion of a rehabilitation program. Isokinetic testing was performed on a Biodex dynamometer at velocities of 60, 180, and 300 deg/sec. Functional tests included the single leg timed hop test, a championship running drill, and a 1 repetition maximum single leg press. Test results were evaluated with limb symmetry ratios-involved to noninvolved or the converse, depending on the measure. Correlations of isokinetic to functional tests identified only one significant correlation between the 1 repetition maximum single leg press and Biodex extension at 180 deg/sec ($r = 0.8160$; $p < .05$). Based on the results of each test, the Biodex may better indicate limb discrepancies and functional tests may better replicate actual limb use. It may be best to combine both closed and open kinetic chain assessments for evaluation of patient rehabilitation.

Handwashing: Semmelweis Revisited

Cara A. Cochran
Dr. Constance Ayers, Faculty Mentor

The benefits and barriers of handwashing, and other infection control measures, have been evaluated. It was found through a review of literature on the subject that handwashing is an effective means to reduce nosocomial infection, although handwashing is underutilized in most healthcare settings. A procedure of handwashing education for nurses has been developed.

Endorsement of Masculine and Feminine Gender Roles: Differences Between Participation In and Identification With the Athletic Role

Sheri Delgman and Jenny O'Brien
Dr. Christopher D. Lantz, Faculty Mentor

The purpose of this study was to examine the influence of identification with the athlete role on the endorsement of masculine and feminine gender role orientations. Four hundred and nine students at a small, Midwestern university completed the Athletic Identity Measurement Scale (AIMS) and the Bem Sex-Role Inventory (BSRI). Participants were classified as either high or low athlete identifiers based on their AIMS score. High and low athlete identifiers and athlete and nonathletes reported similar endorsement patterns of masculinity and femininity. Pearson Product Moment Correlation Coefficient indicated that athletic identity was positively correlated with masculinity and negatively correlated with femininity. Women and nonathletes reported higher correlations between athletic identity and masculinity than did males and athletes. One-way ANOVA revealed that masculine

persons reported higher levels of athletic identity than did undifferentiated or female persons.

The Effect of a Long Distance Run on Running Form

Rachel B. Fuller
Dr. Michael Bird, Faculty Mentor

The purpose of this study was to examine the effects that running 15 miles at a moderate running pace (MRP) versus an aggressive running pace (ARP) has on running form. The biomechanical variables analyzed were: (1) range of motion (ROM) at the knee, (2) ROM at the hip, (3) ROM at the trunk, (4) stride length (SL), (5) horizontal linear velocity of the center of mass (HLVCOM), and (6) vertical displacement of the COM (VDCOM). Two male collegiate distance runners were videotaped at three different locations while performing the 15 mile run. Data reduction utilized the Peak Performance Motion Analysis System. In the ARP, ROM at the knee and hip decreased, ROM at the trunk increased, SL increased, HLVCOM decreased, and VDCOM increased as mileage increased. In the MRP, ROM at the knee and trunk increased, ROM at the hip decreased, SL increased, HLVCOM increased, and VDCOM increased as mileage increased. It is concluded that performing a long distance run at an ARP or MRP affects a persons running form.

Variation in Pregnancy Outcomes of Adolescent Mothers by Age and Race

Shoeleh Navab Hamidi
Dr. Ranjita Misra, Faculty Mentor

There is a general consensus that adolescent pregnancy is a public problem that must be solved. Although nonmarital births are on the rise for all women, they are disproportionately high for adolescents, especially among the poor and African Americans. The purpose of this study is to evaluate the effects of demographic variables such as education, ethnic, marital status and income on birth outcomes of adolescent pregnant mothers in the state of Missouri. The study sample consisted of 9,340 adolescents: Young adolescents (<15 year old) and older adolescents (16 - 19 years). The pregnancy nutrition surveillance system (PNSS), from MO was used for this study. Hypotheses were tested using the Statistical Package for Social Science (SPSSx). Findings support the study's hypotheses: Teenagers, blacks and primiparas had lower educational and income levels. Furthermore, they had a higher incidence of low birth weight babies. Younger adolescents had an increased risk of adverse pregnancy outcomes than older adolescents.

Nutritional Risk in Nursing Home Elderly

Kendra Lukefahr
Dr. Ranjita Misra, Faculty Mentor

Studies indicate approximately 30 to 85% of the nursing home elderly are malnourished. The purpose of this paper was to evaluate the nutritional risk among males and female nursing home elders. Nutrition Screening Initiative Checklist was used to measure the participants' nutritional risk and information was elicited by personal interviews. Subjects consisted of 56 nursing home elders in Adair county, Missouri. Mean age was 84.2 years. The majority of elders were females and Caucasians. Six percent of males and 35% of females were in the 'no nutritional risk' category; 68.8% of males and 48.6% of females were in the 'moderate nutritional risk' category; and 25% of males and 18.2% females were in the 'high nutritional risk' category. A higher percentage of males than females indicated they have an illness or condition that changes their food consumption, have tooth problems, lacking money to buy food, and taking medications. Approximately 40% of males and 36% of females indicated their health status as 'poor' or 'fair'.

Muscular Power Performance Differences in Male and Female Adolescent Athletes

David Mayhew
Jerry Mayhew, Faculty Mentor

The purpose of this study was to determine the relationships among anthropometric dimensions, absolute leg strength, and leg power in high school male and female athletes. Males ($n = 13$) and females ($n = 10$) were measured for height, weight, %fat, muscle circumferences, and leg lengths. They also performed 1-RM leg press and power leg press using 50% of 1-RM. The average gender ratios (female value/male value) ranged from 0.58 to 0.87. The correlations between anthropometric dimensions and strength ranged from 0.28 to 0.89, while the correlations between anthropometric dimensions and power ranged from 0.27 to 0.70. A discriminant analysis revealed that 100% of the subjects could be classified to the proper gender using LBM, %fat, and leg press strength. Despite holding constant muscle size and strength in a covariance design, there remained a significant gender difference in power output. In adolescent athletes, some factor other than muscle quantity and quality may be causing a gender difference in leg power production.

Relationship Among Academic Stress, Time-Management Practices, and Leisure Time Activities

Michelle McKean and Lisa Bayley
Dr. Ranjita Misra, Faculty Mentor

Good time-management skills have been related to a number of positive outcomes. This study examined the relationships among time-management practices, perceived academic stress, and leisure time activities among college students. The sample consisted of 249 students ranging in age from 18 to 30 (mean age = 20.7 years). Majority of the respondents were females and Caucasians. Gadzella's Student-life Stress Inventory, Beard and Ragheb's Leisure Satisfaction Scale, and Macan's Time Management Behavior Questionnaire were administered to measure the concepts of students at Truman State University. Academic stress included nine categories, five of which indicated types of academic stressors (frustrations, conflicts, pressures, changes, and self-imposed), and four describing reactions to stressors (physiological, emotional, behavioral, and cognitive). Pearson's correlations indicated academic stress was significantly associated with time management and leisure time activities of students. Correlations among the perceived academic stress with time-management and leisure time activities were higher for females than males.

The Effects of Functional Knee Bracing on Performance

Heather Murphy
Dr. Michael Bird, Faculty Mentor

The use of functional knee bracing after the rehabilitation of surgically repaired anterior cruciate ligaments is controversial. The purpose of this study was to determine if differences existed between running with and without a knee brace in repaired and rehabilitated knees. The variables of interest were knee range of motion (KROM), stride length (SL), and horizontal velocity of the center of mass (HV). Two females and one male performed the sprint with and without their knee brace. Data were analyzed with the Peak Performance Motion Analysis System™. For all subjects the nonbraced trial had greater KROM, greater SL, and greater HV. These results suggest that athletes wearing functional knee braces in a straight ahead sprint experience decreased performance. These characteristics are harmful if the athlete's event requires a large range of motion at the knee, a long stride length, or if their performance is velocity related. Questions that still remain unanswered are whether the benefits knee braces come at the expense of impaired maximal performance, and whether a repaired and rehabilitated requires a brace in performance.

The Star Wars of Today: Using Technology in Speech-language Therapy

Lisa Odorizzi, Julie Terwelp and Jen Walz
Ms. Melissa Passe Hendler, Faculty Mentor

The use of the Star Wars videodisk has been an ongoing project created for clinicians by a team of graduate and undergraduate students interested in technology. The current project, which will be demonstrated during the session, includes games that facilitate the correct production of sounds in words and sentences. Participants will be invited to view various Star Wars clips and will have the opportunity to explore the related game.

Effect of Oral Creatine Monohydrate and Creatine Phosphate Supplementation on Maximal Strength Indices, Body Composition, and Blood Pressure

Brian Peeters
Dr. Christopher D. Lantz and Dr. Jerry Mayhew, Faculty Mentors

The purpose of this study was to determine the effect of creatine monohydrate (CrM) and creatine phosphate (CrP) supplementation on strength, body composition, and blood pressure. Thirty-five males with strength training experience were tested on three separate occasions (pre-test, three weeks, six weeks). Strength tests performed were the 1-RM bench press, 1-RM leg press, and maximal repetitions on the seated preacher bar curl with a fixed weight. Subjects were divided into three groups matched for strength: placebo (P1), CrM, and CrP. Subjects were provided a standardized strength training regimen and ingested a loading dosage of 20g/day for the first three days of the study, followed by a maintenance dose of 10g/day for the remainder of the six-week supplementation period. Significant differences were noted between the P1 group and the two Cr groups for changes in lean body mass, body weight and 1-RM bench press. These results suggest that oral Cr supplementation will result in greater strength and fat free mass development.

The Finite Subgroups of SO_3

Jill Ralph
Dr. Deborah Denvir, Faculty Mentor

This research project focuses on various aspects of the finite subgroups of SO_3 . These finite subgroups, namely the cyclic, dihedral, tetrahedral, octahedral, and icosahedral, are subgroups which have much to offer in the study of algebraic structures. SO_3 is itself a subgroup of an orthogonal group O_3 . SO_3 only contains orientation-preserving orthogonal matrices. By using the counting formula, these finite subgroups can be classified and several can be shown to correspond to the platonic solids: the tetrahedron, cube, octahedron, dodecahedron, and the icosahedron. In this presentation, the formula will be applied to a couple of these figures to understand the structures of the groups. The presentation will also include a short sketch of the classification theorem of these finite subgroups of SO_3 .

Academic Stress of College Students: Comparison of Student and Faculty Perceptions

Tony Russo and Sarah West
Dr. Ranjita Misra, Faculty Mentor

This study examined the gender differences in perceptions of perceived academic stress among college-aged students, and differences between student and faculty perceptions of students' academic stress. Gadzella's Student-life Stress Inventory was used to measure perceived academic stress of students at Truman State University. Sample consisted of 249 students and 67 faculty members. Mean age of the students was 21 years and faculty was 42 years. Results indicated a considerable mismatch between students' and faculty's perceptions of students' stressors and reactions to stressors. The faculty members perceived the students experiencing two stressors (frustration and pressures) and three reactions to stressors (behavior, emotion, and physiological) more frequently than what students actually perceived. This could result simply from the faculty observing the students only during their moments of stress in the classroom. Female students reported experiencing more stressors and reactions to stressors than male students.

Differentiated Nursing Practice

Becky Salaban
Dr. Connie Ayers, Faculty Mentor

Since the year 1965 the nursing profession has identified the BSN as the entry level for professional nursing practice. However, educational preparation of practicing nurses varies greatly with a larger proportion of practicing nurses having only associate degree preparation as their highest degree of education. This study investigates the issues surrounding nursing practice and the appropriate practice roles for professional nursing and technical nursing practice. The investigation was based upon a review of literature and analysis of the 1996 United States Division of Nursing RN population data. Differentiated nursing models were evaluated and nursing practice data was analyzed to reveal the feasibility of implementing one of several differentiated practice models. Lastly, suggestions for nursing practices changes were researched and are to be discussed.

Muscular Endurance Performance Relative to Body Weight in College Football Players

Julie Schell
John Ware and Jerry Mayhew, Faculty Mentors

The purpose of this study was to determine the loads relative to body mass which most accurately predict 1-RM bench press performance. College football players ($n = 58$) were tested for 1-RM bench press and for repetitions-to-fatigue using 100%, 110%, and 120% of body mass. Test order was randomized, and at least 24 hours rest was given between test sessions. Repeated-measures ANOVA indicated that the number of repetitions completed at each percentage was significantly different across the three levels ($F = 405.17$) but not significant different among the playing positions ($F = 2.34$). Multiple regression to predict 1-RM bench press using the weight and repetitions at each percentage produced $R > 0.92$. The SEE decreased from 21.9 Lbs. using 100% of body mass to 15.8 Lbs. using 120%, of body mass. Six players were unable to perform any repetitions with 120% of body mass. It appears that fewer repetitions provide more accuracy predictions of the 1-RM.

Alcohol Use at Truman State University

Jason A. Studley
Dr. James Padfield, Faculty Mentor

Alcohol abuse in a young adult population has been shown to have a wide variety of negative consequences, including an increased risk of accidental death, increased risk of violent behavior/ victimization, and an increased risk of unsafe sexual behavior. According to self-reported levels of alcohol consumption from an anonymous survey administered in Truman State University's HLTH 194 classes

($n=616$), 52.4% of male students can be classified as binge drinkers (5 or more drinks in a single setting), 21.4% as social drinkers, and 26.2% as nondrinkers. Females showed a binge drinking rate (4 or more drinks in a single setting) of 36.6%, with 28.7% social drinkers, and 34.7% nondrinkers. In addition to the increased level of alcohol consumption associated with male gender ($r=.32$; $p<.001$), increased alcohol consumption was associated with membership in a fraternity or sorority ($r=.26$; $p<.001$) and living off-campus ($r=.20$; $p<.001$).

Knowledge, Perceptions, and Behaviors of Parents Regarding Immunizations

Jill Stukenholtz
Dr. Beverly Tremain, Faculty Mentor

Knowledge, perceptions, and behaviors of parents ($N = 116$) regarding immunizations of their children were examined in this study. Demographic information as well as self-assessment of immunization knowledge, a disease identification test, and perceived barriers to receiving immunizations on schedule were surveyed. Major barriers included waiting room time (25%), employment conflicts (18%), and the physician thought the child was too sick (12%). Of the total sample, 87.1% reported current immunizations for their children and 12.1% reported a lack of current status. Differences were found between those who were current and not current with respect to understanding of the immunization tests. Differences were seen between income groups as well.

The Influence of Exercise Modes on Self-Esteem and Social Physique Anxiety

Mark T. Willard
Dr. Christopher D. Lantz, Faculty Mentor

The purpose of this research was to examine the effects of a variety of exercise modes on the self concept variables of self-esteem and social physique anxiety. One hundred thirty-eight (66 males, 72 females) undergraduates enrolled in a university required health and wellness activity course completed the Rosenberg Self-Esteem Scale (RSES) and the Social Physique Anxiety Scale (SPAS) before and after participating in the course's required seven week exercise regimen. Separate 2 x 5 (gender x activity type) ANOVAs on participants' responses to the RSES and SPAS revealed no significant interactions or main effects for any of the variables. However, main effects for gender $F(1, 128) = 3.839$, $\eta^2 = .052$ and activity type $F(4, 128) = 2.283$, $\eta^2 = .064$ approached significance with regard to change in self-esteem. Separate one way ANOVAs indicated that males' ($M = -.143$) self-esteem improved more so than females' ($M = -.028$) and participants in aerobic dance ($M = -.409$) improved more than did any other exercise group.

Language & Literature

The Waves

Shalyn Claggett
Bob Mielke, Faculty Mentor

The paper I intend to present is entitled “Contrasting Mindsets in Virginia Woolf’s *The Waves*”, written under the direction of Dr Bob Mielke My paper is a critical, formalistic analysis of Virginia Woolf’s novel, *The Waves*, arguing that the work indicates the delineation of the six focal characters into three male/female pairs which respectively illustrate three contrasting mindsets regarding life in the characters generation The first pair, Neville and Jinny, rationalize life as a continual search for the perfect present moment; the second pair, Bernard and Susan, view life as an unending continuum of creation; and the final pair, Louis and Rhoda, interpret life as an essentially futile, oppressive experience These contrasting philosophies, I shall argue, are the core of each pair, serving as the underlying impetus for the thoughts/ emotions and actions of each character

Shen Congwen and the Subconscious Story

Cheryl DeBeaux
Dr. Wenying Xu, Faculty Mentor

Due to a minimal amount of contact with Chinese literature and its relatively small impact on Western literature, the Western reader may be unfamiliar with Chinese author Shen Congwen. However, the influence of modernist literature and ideas that filtered into China from the West can be felt in the fiction of Shen Congwen. This study is an attempt to trace that influence through the emphasis on self and the subconscious in the stories of Shen Congwen. An understanding of the impact of these concepts is integral to an understanding of Shen Congwen’s writing because he used them to shape his stories, experimenting with elements of plot, point of view, characterization, and symbolism. These innovations in the short stories of Shen Congwen are outlined and discussed.

Feminine Speech Acts in the Canterbury Tales

Lynn Cutler
Dr. Adam Davis, Faculty Mentor

Speech can be an indication of power or the lack thereof. Speech act theory, applied to female characters from Chaucer’s *Canterbury Tales*, shows them to be “voiced” or “voiceless,” and to possess varying degrees of power. The Wife of Bath can find no one to

interact with her, and her society-forced silence renders her essentially voiceless. In contrast, the pillow speech of the Hag in her Tale creates in her marriage mutual submission, and therefore expresses power. In the Clerk’s Tale, Griselda, through a performative speech act, promises to remain voiceless. Yet, her persistent silence makes her powerful. Dorigen’s two contradicting performative speech acts in the Franklin’s Tale nearly destroy her marriage. The speeches of these four women reflect their power and influence in the world around them.

Literature and then some

Sarah Detweiler
Chett Breed, Faculty Mentor

Some of the following authors, editors and ‘experts’ have raised my consciousness surrounding literature and its overwhelming effects: Louise Rosenblatt, Peter Elbow, E.D. Hirsh, Carole Edelsky, Nancy McCracken, Bruce Appleby and Joseph Gibaldi. In my research, which was an accumulation of three years as an English major, I found that the study of literature is not just about the text itself, but a multitude of things. This multiplicity was the focus of my research and is the thesis for this presentation. In the paper I explored literature as being multi-faceted and concluded for myself that ‘knowledge’ within the field of literature is representational of knowledge of oneself, and more importantly others.

“The Devil and Demonic Despair in the Canterbury Tales”

Colby Dickinson
Dr. Adam Davis, Faculty Mentor

Sporadically throughout the *Canterbury Tales*, the devil, although often ambiguous, tempts and beguiles humans in an effort to ruin them before God. As previous scholarly research has shown, the devil functions as a tool of God, or as an intermediary between a dualistic world involving God and Humankind. However, despite the insights afforded by such an inquiry, it fails to address the entirety of the situation. By examining the dualistic conception of the world provided by patristic theologians, this paper will discover the larger spectrum on which the devil appears as only a small partner, subordinate to the decisions of both God and Humankind. Utilizing the relevant observations which a humanistic approach affords, this paper reveals how the psychological presence of “demonic despair,” as conceived by the philosopher Søren Kierkegaard, leads to the corruption of Humankind and, like the devil himself, can lead to an usurping of God’s power in an attempt to take mastery over other humans.

Religious Neo-Gothicism in America: The Evolution to a National Style

Carl Duffield
Dr. Adam Davis, Faculty Mentor

Architectural styles are neither chosen randomly nor without significance. Rather, they give physical expression to the values of the society which interprets and assimilates them. From our country's origins, religious as well as secular forces have defined and redefined the architectural styles of the American church. Benefiting from the murkiness of a medieval past and its fortunate alignment with Romantic aesthetics, Neo-Gothic architecture evolved from obscurity in the eighteenth century to national dominance in the twentieth century.

Linguistic Bias against the Gay Community

Renee A. Eveland
Dr. Monica Barron, Faculty Mentor

A close evaluation of language can reveal the ways in which groups of people are systematically marginalized, devalued, and even oppressed within a culture. One such instance of linguistic bias against the gay community can be found in American English. Having identified three components of this linguistic bias, I am researching the marginal position of the gay community in American society which is reflected in language. The three constituents of bias I have identified include: 1. the common use of terminology with pejorative connotations, 2. semantic and referential ambiguities and 3. what I have termed "lexicon gaps" which reflect a too-limited and prejudicial scope of thinking which devalues and excludes the gay experience. This research involves the integral relationship of sociology and linguistics as it examines the sociological implications of language.

Chaucer's Egalitarian Marriage in The Franklin's Tale

Sarah Fehrenbacher
Dr. Adam Davis, Faculty Mentor

In my essay, "Chaucer's Egalitarian Marriage in The Franklin's Tale," I examine the true intent of Chaucer's *The Franklin's Tale*. By examining the actions of the three main characters Averagus, Dorigen, and Aurelius I illustrate how Chaucer intended the tale to be an example of a marriage of equality. Furthermore, she argues against author of "What of Dorigen? Agency and Ambivalence in *The Franklin's Tale*" Francine McGregor's assertion that the true intent of the tale is to illustrate the generosity between Averagus and Aurelius and to diminish the role of Dorigen in the tale.

Akira Kurosawa, Auteur

Ken Floro III
Dr. Cole Woodcox, Faculty Mentor

French film critics in the mid-twentieth century developed a form of film analysis called the Auteur Theory. This theory emphasizes film directors, examining a series of works from a given director to determine trends, patterns and characteristics of that director's style. By reviewing the films, "Dodes Kaden," "Dreams," "Kagemusha," "Ran," and "Seven Samurai," a vision of Kurosawa as an auteur emerges. To support this, five sources for professional film criticism were explored and applied to an analysis of Kurosawa's films.

Chaucer's The Canterbury Tales: variety in phonetic interpretation.

Timothy Ford
Dr. Mary Shapiro, Faculty Mentor

Middle English, the language of Chaucer's *Canterbury Tales*, no longer has any native speakers. For this reason, there is much debate over the exact pronunciation of this ancestor of Modern English; different scholars have different vocal interpretations, and their phonetic variances are not always a result of conflicting theories, but, rather, are the result of an inability to articulate the sound needed. Samuel Moore offers his opinions in a book entitled *The Language of Chaucer*, in which he discusses some of the vowel and consonantal articulations, as well as syllabic qualities of Chaucer's period in Middle English, and how they would be articulated today. An audio tape entitled *Chaucer Aloud*, a compilation of many scholars' vocal performances of Chaucerian Middle English, provides us with a framework with which to view, test, and draw conclusions about the verity and/or falsity of their oral interpretations.

Gender and Society in Willa Cather's The Professor's House

Terri Ann Fredrick
Dr. Martha Barter, Faculty Mentor

Willa Cather published her sixth book, *The Professor's House*, in 1925, three years after, according to Cather, "(her) world broke in two." This break followed the criticism of her earlier war novel, *One of Ours*, and Cather's subsequent illness. In *The Professor's House*, Cather's growing disillusionment is apparent, most especially in the parts involving the Professor and his family. The novel itself is divided into two main sections: Tom Outland's story, which makes up the central part of the book — and was written first — and the tale of the Professor's family which surrounds it. Cather created several

obvious differences between these two sections; the main body is written in third person, while Tom narrates his own story. The settings, characters and even time periods are different. This presentation will attempt to analyze the gender-related contrasts between the societies of Tom Outland and the Professor.

Oppositional Discourse in the Fables of Jean de La Fontaine

Jennifer Giles
Dr. Patrick Lobert, Faculty Mentor

The theory of oppositional discourse arose in the late 1960s and today the idea is heavily debated in critical circles. Oppositional theory, as defined by Ross Chambers in his book *Room For Maneuver*, attempts to understand literature as a discourse which, while deriving its authority or “right to speak” from established power, simultaneously and ironically encodes messages which challenge and oppose power. To illustrate this theory, Chambers analyzes three fables by French author Jean de La Fontaine, emphasizing irony and oppositional technique within the tales. This study uses Chambers’ research as a jumping off point for a detailed examination of additional fables by La Fontaine in an effort to determine to what extent Chambers’ theory of oppositional discourse is useful to describe literary texts.

The Pursuit of Imperfection

Leslie Graff
Dr. Dennis Leavens, Faculty Mentor

The British Victorian society faced issues such as Darwin’s theories of the nature of humankind, the Industrial Revolution, and changing views on women’s places which served to uproot older theories of proper values and ethics. As a result of these changes, a philosophy arose which encouraged the pursuits of emotion, finding value in humanity, and realism. Numerous authors reflected these ideals in their work. This presentation will include works by Edward Fitzgerald, Robert Browning, Elizabeth Barrett Browning, Matthew Arnold, Charles Dickens, George Eliot, John Ruskin, and William Wordsworth to develop a comprehensive view of a culture that found a better ideal for humanity through the reality of its changing world.

The Importance of Women in Hopi Mythology and Culture

Heather Grimes
Dr. Martha Bartter, Faculty Mentor

In any culture, societal values will reflect the mythology upon which the culture bases and defines itself. In Hopi Pueblo culture, women are seen as an important and essential part of their society. From the story of Spiderwoman and the Emergence to the matrilineal descent kinship system, women are given a great deal of reverence. Writings on Hopi mythology and social practices were examined for connections between the two.

The Hemingway Hero and Nick Adams

Sandra Gulotta
Martha Bartter, Faculty Mentor

It is my intent to present my Undergraduate Research Symposium project on Ernest Hemingway’s hero concept in his short book *In Our Time*, focusing mainly on his character Nick Adams. I would like to give a brief overview of the different types of Hemingway hero. This section will mention the four different types of hero, including the hunter, the Christ figure and the bullfighter. I will also briefly discuss the way a Hemingway hero deals with impending death. Then I would like to narrow the focus more closely on Nick Adams in *In Our Time*. I am interested in discussing Nick Adams as a hero, as he searches for a sense of self in *In Our Time*, particularly the “Big Two Hearted River” sections.

“Spinning Faces: Examining the feminine in Truffaut’s *The 400 Blows*”

Ellyn Audrey Herr

Francois Truffaut’s film “The 400 Blows,” though its focus shepherds our sympathy towards the 12 year-old misunderstood boy, could be seen as a film sympathizing with the plight of women in France’s 1950s. Throughout the young protagonist’s difficulties, the feminine characters are depicted as the underlying cause. From a feminist stance, however, the tragedy is greater if we realize what social tensions were at work to put women in their confused places. Part of the process of determining the core of Antoine’s suffering singles out Mother/Feminine as failing in her role, depriving youth of the nourishment that they require to veer from delinquency and thrive as future adults. The feminine is portrayed through the mothers, prostitutes, and psychologist as frustrating and cruel. She will not fulfill her role but teases with insincere attempts at kindness. At the same time, she will not release him from her cold womb, as

symbolized by the ocean that foils his final escape. Beyond this layer, with a feminist methodology, the sympathy can be shifted from the obvious victim to the ones disguised as monsters.

The Use of Bibliotherapy in Today's Society

Stacey Hildebrandt
Chett Breed, Faculty Mentor

Introduced to the medical world not too long ago was a new concept called bibliotherapy. According to the *Dictionary of Education*, it is defined as "the use of books to influence the total development process of interaction between the reader and literature which is used for personality assessment, adjustment, growth, [and] clinical and mental hygiene purposes..." This presentation will demonstrate how the necessary steps that a authoritative figure must follow in order for bibliotherapy to be successful. This poster presentation will also show why psychologists, teachers, and parents are turning to literature to assist children with elements of society (divorce, death, child abuse, adoption, illness, and so on) that are difficult to comprehend.

Mandarin Morphology

Jennifer J. Hughes
Dr. Mary Shapiro, Faculty Mentor

This presentation will look at the morphology of the Chinese (Mandarin) language. Although morphology is but a segment of linguistics, it is an important aspect of linguistic universals. Mandarin contains very little morphology, which makes it a particularly intriguing language when considering it in the realm of the search for these universals. It is an extremely interesting test case because of the few examples of morphology in the language. L his presentation will focus on the compounding which occurs in the Mandarin language, and will provide examples for each of the morphological processes that occur in the language.

A Linguistic Analysis of the Coverage of Princess Diana's Death

Debbie Hunt
Dr. Cheryl Engber, Faculty Mentor

The media are an important part of American society today and can greatly impact a person's attitudes and perceptions. Magazines are designed for targeted audiences and use language to express their various opinions and attitudes, to appeal to their audiences and to achieve their different purposes. *Time*, *Newsweek*, *People* and *World* magazines were examined for their coverage of the death of

Princess Diana. First, the scope of coverage in the four weeks immediately following Diana's death was studied. Second, in the article initially announcing Diana's death in each publication, the use of language was studied in detail (vocabulary, syntax and register). Relationships between the language used and the magazines' intended audiences were examined.

Cultural Literacy: Educating A Literate America

Doug Jameson, Tara Ramsey, Suzie Wright
Dr. Patricia Smiser, Faculty Mentor

E.D. Hirsch, a leading educational theorist, has written several controversial books on cultural literacy. He argues that schools should focus on promoting a common curriculum consisting of extensive lists of facts that all Americans should know in order to function in society. Other educators and theorists accuse Hirsch of placing too much emphasis on content learning when many schools are focusing on combining content with process-based learning and assessment. According to Peter Elbow in *What is English?*, "learning involves the making of meaning and the reflecting back on this process of making meaning—not the ingestion of a list or a body of information" (18).

The presentation will include research on E.D. Hirsch's *Cultural Literacy*, opposing viewpoints, and an examination of how Hirsch's lists can be applied in the classroom using process-based learning techniques.

Motivations of Degeneration within Fragment A of The Canterbury Tales

E. Kyle Kelley
Dr. Adam Davis, Faculty Mentor

Fragment A of Chaucer's *The Canterbury Tales* introduces recurrent themes found throughout the work. The fragment also follows what Donald R. Howard described as a "degenerative movement" in regards to the genre, skill, and intention of each tale. By examining the interactions of the individual characters and the motivations of each tale, this "degenerative movement" becomes clearer. The characters of the Knight, Miller, Reeve, and Cook are using their respective tales to advance certain world views. The fragment degenerates from social and philosophical questions posed by the Knight and Miller to the Reeve and Cook's reliance on insult and vengeance. The tale-telling rapidly turns into a means for male competition in which class and character affect the quality of the tales.

“The Doing of it”: Inman’s Existential Choices in Charles Frazier’s *Cold Mountain*

Alex Moseley
Dr. Priscilla Riggle, Dr. Natalie Alexander, Faculty Mentors

Charles Frazier’s 1997 novel, *Cold Mountain*, chronicles the journey of Inman, a deserter from the Confederate Army at the end of the American Civil War, as he makes his way to his home on Cold Mountain—a story firmly positioned in the tradition of Homer’s *Odyssey*. Inman’s journey also represents a series of choices which place his desire to leave the fighting—to go home—in opposition to competing values, such as his regard for life and his reluctance to endanger the woman to whom he returns. This critical analysis, incorporating primary and secondary research of existentialism as envisioned by Jean-Paul Sartre, examines the development of the main character through the continuum of his choices. This analysis is based on the belief that Inman’s journey reflects his existential development as a “being-for-itself,” making choices that reflect his essential free will and an understanding and acceptance of that freedom.

The Modern Myth of Marilyn Monroe

Bonny Moseley
Dr. Jack Hart, Faculty Mentor

Marilyn Monroe is often considered the ultimate sex symbol, whereas Norma Jeane Baker was an actress who strove for knowledge and respect. Norma Jeane was forced to take on a sexy persona to gain the attention of the media, and consequently was never able to change it. Decades after her death, she has grown larger than life into a mythic figure, with the dominant image being the brainless sexpot. I will analyze this image by applying mythic criticism to two artifacts. This method allows the audience to identify what mythic elements are operating and what they communicate about values, beliefs and attitudes. The first is a publicity photo from one of Monroe’s most successful movies, “The Seven Year Itch.” The second is the tribute song by Elton John, “Candle in the Wind.” Through interpretation of these artifacts, I will explore the modern myth of Marilyn Monroe.

“Does the Lion Ever Kill the Mouse?” Story-Telling Among the Ewe People of West Africa

Matthew Nelson
Ed. Tyler, Faculty Mentor

The presentation describes the student’s experience collecting Ewe folktales, fables, and lore in rural Togo, near the village of Kpeletoutou. Supported by projected still photographs and a brief audio example, the oral presentation provides a performance context for the traditional beast fable “The Mouse and the Lion,” describes the Ewe customs surrounding the story-telling event, and narrates the negotiations undertaken by the student with the village elders in order to be permitted to collect these stories.

The Morality of the Franklin’s Tale

Aaron Nord
Dr. Adam Davis, Faculty Mentor

The Franklin’s Tale, one of Geoffrey Chaucer’s *Canterbury Tales* continues to provoke critical controversy more than half a millennium after it was written. This research project remains neutral in the current arguments surrounding the tale and instead proposes a complementary viewpoint. It proposes that the Franklin’s tale opposes the immorality of the genres of fabliaux and courtly romance already told in the *Canterbury Tales* and popular in Chaucer’s time. The Franklin accomplishes this by juxtaposing a conventional hero of these genres with a very unconventional marriage. This alerts his audience that his tale will not be a standard fabliau or courtly romance. He then uses the contrast between the protagonist and the married couple to expose the essential immorality of these genre’s values.

Adultery and fear of the woman in Chaucer’s *Canterbury Tales*

Nikolay Ouzounov
Dr. Adam Davis, Faculty Mentor

One of the major issues in Chaucer’s *Canterbury Tales* is the problem of adultery and the relationships in marriage. This theme is the main subject in the Miller’s, the Reeve’s and the Merchant’s Tales. A shared characteristic of these tales is the form of fabliau, and adultery as a basic conflict. Considering the cultural context, this so called marriage group of tales reveals the widespread pattern of representing women as deceiving and corrupting. Beyond the general frame of the narrative, we can see that Chaucer reveals women as energetic, healthy beings that follow their nature and instincts, as opposed to men who, in spite of their scientific

knowledge, are often deceived and humiliated by the female characters. Having in mind the male dominated social environment of the work, these trends reveal male insecurity and hidden, not fully realized, fear of the woman and her sexuality.

Abstract on “Life Worth Living”

John Pa
Dr. Xu, Faculty Mentor

In my presentation, I discuss Shen Congwen’s existentialist tones in his writings by utilizing the theory of existentialism, and, historically, its introduction to China. But my main focus is on textual analysis to critique the emergence of the Self in Shen’s writings.

Media Framing and Cloning

Angela Porter
Dr. Karon Speckman, Faculty Mentor

In February 1997, scientists announced that a sheep had been cloned in a Scottish laboratory. After the cloning was made public, the media spent a great deal of time covering this step in genetic research. My research studied the media’s coverage in five magazines for the first month after the cloning announcement. The researcher examined factors such as graphics that accompanied the articles, headlines, overall tone of each story, and which sources were used. Through the use of framing - or how they choose to tell the story – the media influenced the public’s perception of cloning by extensively speculating on this procedure’s possible use for cloning humans. The media played up this possibility, which led to a public mistrust of genetic research.

Langston Hughes—The Strength of His Poetry and His Survival as a Black Poet

Laurelyn Roberts
Dr. Martha Bartter, Faculty Mentor

During the modern era at the beginning of the twentieth century, black writers worked hard to excel at prose or poetry. They also strived to enhance the acknowledgement of the black race. Langston Hughes was one of these black writers. His strengths were prevalent in his poetry and in the influence he had over many Americans with his involvement in the Harlem Renaissance. However, unlike black writers at this time, his popularity did not stop when the Renaissance did. Langston continued his success and proved to be an excellent writer and amazing survivor during a time when black people were still not treated as equals.

What is Happening in the Brains of Children with Communication Disorders? A Look at Stuttering and Verbal Apraxia.

Aimee Senf and Liza Mendenhall
Dr. Cheryl Engber, Faculty Mentor

Communication disorders are found among children at the elementary level. There are countless types of disorders. Stuttering is one articulatory disorder in which speakers overcontract muscles of articulation. However, it goes beyond articulatory dysfunction and is hypothesized to be caused by improper synchronization of phonological production and assembly in the brain. Verbal apraxia is another articulatory disorder which involves difficulty in voluntary motor control. Individuals with apraxia are able to engage in casual conversation with little hesitation. Yet, when they are called on to speak, they have severe difficulty in moving their articulators. There are many different hypotheses about what causes these disorders on a neurological level. We will discuss the validity of the various hypotheses from a psycholinguistic standpoint.

Broadcast Debates and the Development of a New Legal Standard

Susan C. Senger
Dr. Karon Speckman, Faculty Mentor

This paper studies how a new interpretation of equal time is developing and how the laws will be changing as broadcasting time becomes more valuable to politicians and voters. The researcher examines primary sources such as current court cases, statutes, and federal regulations. All of these indicate a trend toward more governmental regulation. Ideally, all public office candidates in both national and local elections want to be included in broadcast debates. However, broadcasters are asking the courts to define which candidates must be admitted in debates under current election laws. With each moment being a commodity, broadcasters strive to meet the needs of the public, advertisers and programming. Debates are often the pivotal factor for undecided voters. The results of broadcast debate court cases will determine candidates’ exposure, and ultimately, the elections.

Regulating Indecency on the Internet: Finding the Medium Between Broadcast and Print

Karin Stoltenberg
Dr. Karon Speckman, Faculty Mentor

In February 1996, President Clinton signed into law the Telecommunications Act. A specific provision of the Telecom Act, the Communications Decency Act (CDA), attempted to regulate indecency on the Internet. In the following months, free speech activists challenged the constitutionality of the CDA through numerous lawsuits, and these lawsuits culminated in the U.S. Supreme Court case *Reno v. ACLU*. In *Reno v. ACLU*, the Supreme Court found the CDA violated the First Amendment, and the Internet remained free of content-based government regulation. However, even though the Supreme Court dissolved the authority of the CDA, the debate concerning indecency and minors' access to indecent materials via Internet heightened. This paper analyzes implications of the decision of *Reno v. ACLU* and pending legislation and argues that the government should write a new law falling within the parameters of *Reno v. ACLU* and create a new category of media strictly for cyberspace technology.

The Best That Earth Could Offer: A Feminist Criticism of *The Birthmark*

Jolynn Thomas
Patricia Montalbano, Faculty Mentor

The Birthmark by Nathaniel Hawthorne has much to say about relationships between men and women. Feminist Criticism seeks to examine these relationships and to identify various ways women are exploited and suppressed in literature. *The Birthmark* illustrates the dominance a man can have over a woman when he breaks down a woman's self worth. When this happens, her feelings and emotions become entirely dependent on his and because of this, the woman will do almost anything – including altering her appearance – to please the man. When a man's happiness is entirely dependent on a woman's appearance, he may become obsessed with making her perfect. In *The Birthmark*, Aylmer is willing to put his wife's life at risk in order to possess the perfect woman. This perfection that (Aylmer) is searching for does not exist. It is an illusion.

American Sign Language Acquisition

Billie Vargas and Amy Colston
Dr. Mary Shapiro, Faculty Mentor

Theorists have studied American Sign Language (ASL or Ameslan) acquisition in infants and children. This research is being used to develop better and more effective ways to teach a language, both spoken and sign, universally. We will be looking at research conducted on ASL by U. Bellugi and E. Klima as well as R. Hoffmeister and R. Wilbur. We will look at research focused on spoken language acquisition from V. Fromkin and R. Rodman. This research shows that in both ASL and spoken language, children of the same ages erroneously use deistic pronouns, nouns, and gestures.

We will be comparing and synthesizing the data of these theorists to determine the similarities between spoken language and ASL acquisition in children between the ages of three months and two years. Comparisons between the two will help in future research determining how language is acquired. This will help in teaching new languages to people of all ages.

Linguistic analysis of sports announcers

Emily Vogel
Dr. Cheryl Engber, Faculty Mentor

For sports fans, nothing compares to experiencing the thrill of a close, competitive game of their favorite team. Dedicated sports fans schedule their lives around game time, hosting parties, and tailgating. The unfortunate fans who are not able to absorb themselves in the live action depend on transferring the excitement to their homes, place of work, or cars via television or radio. This is why we depend on the talents of sports announcers to add the extra excitement and to educate us on the rules and strategies of the game. This is a linguistic study focused on finding patterns among sports announcers in the areas of vocabulary, slang, and expression. Segments from various professional football games were used to analyze sports announcers on television and radio. Patterns were found in specific football terms, metaphorical comparisons to war, and creative figurative expressions unique to each announcer.

American Foundations

Fantasy Images in the Work of T.S. Eliot and Elliott Daingerfield

Aimee B. Couste
Dr. Robert Mielke, Faculty Mentor

American society at the turn of the century was in a state of metamorphosis. Once a largely agrarian society, the country evolved into an industrial, economic, and political power. The disruption of the rural communities and the increasing concerns of an urban industrial society had many people longing for the past. Much of the art and literature of the early twentieth century reflected this reluctance to accept societal changes. Writers and artists such as T.S. Eliot and Elliott Daingerfield created images of fantasy worlds in which people could escape the everyday realities of a changing society. In "Love Song of J. Alfred Prufrock," by Eliot, and "Spirit of the Storm," by Daingerfield, these artists illustrate the importance of personal escape in early twentieth century American society.

Early Twentieth Century Class Consciousness as Reflected in the Works of John Sloan's "Roofs, Summer Night," Charles Ives' "Central Park in the Dark," and Upton Sinclair's The Jungle.

Amanda Crowell
Dr. Robert Mielke, Faculty Mentor

This paper discusses these three works, as well as the artists and their backgrounds and political affiliations, and demonstrates a correlation between the works and the class sensitivity prevalent in the early 20th century.

"Conceptions of Women by Women of the 1970s"

Cheryl Hindrichs (Reynolda House Program)
Dr. Bob Mielke, Faculty Mentor

"Conceptions of Women by Women of the 1970s" explores the perceptions of women illustrated in the works of composer Elizabeth Vercoe's 1978 *Herstory II*, artist Mary Frank's 1976 *Seated Female*, and writer May Swenson's 1970 "Women." In her score *Herstory II*, Elizabeth Vercoe portrays the hysteric emotions women are driven to by romantic love and the duality of such love. Alternately, Mary Frank's sculpture *Seated Female* depicts woman as being one with the cycle of creation and her selfhood. And finally, May Swenson

illustrates women's denied selfhood as "the Other" of men in her poem "Women." Using a manipulation of space and movement as primary tools of depiction, these female artists responded to the cultural climate of the 1970s, worked apart from established artistic conventions, and integrated personal experiences into archetypes.

Communication Symposium

The Practicality and Ethicality of Ghostwritten Speeches

Shapath Bhatta* and John Sanders
Dr. Barry C. Poyner, Faculty Mentor

Logography or speechwriting dates from the birth of rhetoric. From its beginning, the practice has been questioned on ethical grounds. The researchers particularly explore the implications of United States Presidential speechwriting for rhetorical critics.

Bathing Suits, Ballgowns... And benefits?

Debbie Blackwell
Susan Kirk, Faculty Mentor

Since 1990, the popularity of pageants has decreased significantly while being subject to excessive scrutiny. However, contrary to popular opinion, the benefits of participating in the Miss America Pageant Program far outweigh any disadvantages one might find in pageant competition. Competition guidelines for scholarship pageants are often unstated and grossly misrepresented. The purpose of scholarship pageants is to promote professional and personal development through scholarship grants. Physical 'beauty' is not one of the criterion for which a contestant is judged. The Miss America organization has helped to fund the education of thousands of young women. According to the 1997 Miss America board of directors, since 1945 more than \$29 million in scholarship assistance was available to participants at all levels of competition. The philosophy behind the pageantry of the Miss America program is of making a lifetime investment in yourself and your future.

Communication Audit of Kirlin's Hallmark

Jim Cain*, Melody Jennings, Amy Lessmann, and Sara Loveless*
Dr. Dale Keller, Faculty Mentor

Hallmark Cards has been consistently awarded for being one of the best companies to work for by journals like *Personnel Journal* and *Working Mother*. It has placed twice in the top ten in The 100 Best

Companies to Work for in America. Upon research of the Kirksville Hallmark store through interviews, surveys, and observation, it was discovered that Kirlin's Hallmark has a traditional and hierarchical chain-of-command which allows for only one-sided communication. Company slogans and both internal and external communication were examined. Suggested solutions were to allow sales associates more freedom in the work environment and to encourage bottom-up evaluation.

Ebonics: Is There A Useful Potential

Robert DeGraffenreid
Dr. Christopher Gregory, Faculty Mentor

The poster presentation is a collection of data and interviews from both sides of the Ebonics issue. The display is to involve and educate the viewers, so that the viewers may reach their own decision on the usefulness of Ebonics. The scope I chose was that of early America against the British. The creation of the American English was in some ways exactly like the creation of Ebonics. The differences between the two creations are:

- 1) American English was an integrated part of our culture and spoken by the majority of the settlers, Ebonics is spoken by a specific minority.
- 2) The distance from England also allowed the development of the American English to succeed, Ebonics is trying to develop within America.
- 3) As the American settlers spoke French as the lingua franca, the African-Americans should know English, as a language of business and intercommunication with other races.

Transforming the Distorted Image of Women in the Media

Erin Hutchinson
Dr. Mary Triece, Faculty Mentor

The media's often disconcerting image of women is clearly reflected in both men's and women's view of females in our society. Despite the strides towards equality concerning gender, research shows strong negative stereotypes still prevail and are reinforced through the media. This study of women's images in mass mediated messages suggests that children are taught through media suggestion that the male gender is superior. All aspects of the media (i.e. sitcoms, advertisements, news articles) promote the stereotypes that teach impressionable young children it is acceptable to exploit women for their sexuality and take a subservient role to the male gender. The great lack of role models is hindering our young girls from recognizing and refusing to put up with the current stereotypes that resist progression towards equal treatment and consideration to the female gender.

Shielding Journalists: Laws Would Prevent Subpoenas

Elizabeth Kelly
Dr. Karon Speckman, Faculty Mentor

News outlets often are served with more than 3,000 subpoenas in one year. The courts ask reporters to share the material they gained in the news gathering and writing process. No federal law exists that protects journalists in all 50 states, but there are state statutes called shield laws protecting journalists in 29 states. However, many statutes lack definitive clauses or phrases that would protect journalists from court or grand jury demands for unpublished information. This paper explores the need for states to implement and revise shield laws. The researcher analyzes and compares existing state shield laws, presents court cases, and discusses the ethics behind shield laws.

"One Over the Cuckoo's Nest" A Social-Psychological Criticism based on Cognitive Dissonance Theory.

Gonzalo Martin
Dr. John Hart, Faculty Mentor

The clash between social requirements on one side and the individual's inherent needs as a human being is a major issue in modern society. This Social Psychological criticism, based on Cognitive Dissonance Theory, interprets the movie "One Flew Over the Cuckoo's Nest", to conclude that the author presents us an analogy of the formerly cited issue. He criticizes the contradictions of society which appraises freedom as a value to pursuit and, at the same time, limits our self-expression. He also offers a solution, which is the spontaneous expression of one's self, the return of modern humans to nature and the achieving of one's dreams.

Geodemographics: A Modern Marketing Tool with the Potential for Danger

Teresa McAlpine
Dr. Gary Jones, Faculty Mentor

Geodemographics is a marketing tool used to segment advertising audiences into neighborhoods with similar characteristics. The information used to divide the nation is gathered through a variety of methods, some of which engender suspicion. Issues of whether the current information gathering techniques are ethical or not are discussed as are examples of products that utilize geodemographics in their marketing.

The Panther's Tale: A Creative Short Story

Amanda Mincemeyer
Dr. Martha Bartter, Faculty Mentor

"The Panther's Tale" is a creative short story by the presenter that details a Transylvanian legend. The ethnographer who tells the tale is xenophobic and ethnocentric, but does not realize that she reveals these qualities in her writings or that even exist within her. Instead, she projects these qualities onto the villagers she studied. For example, she writes of the villagers' physical condition, which is disgusting to her, then later writes of the villagers' ignorant fear of people different than themselves.

Socratic Analysis of Richard Nixon's Speech to the Nation on November 17, 1973

Brian Moline
Dr. Barry Poyner, Faculty Mentor

Socrates and Richard Nixon were separated by over 2000 years. However, it is interesting to speculate how Plato's mouthpiece would have reacted to Richard Nixon's ethos (ethics) in general, and ethical appeals in this speech in particular. The analysis provided occasion to explore the concept of ethos and how various rhetoricians have viewed this concept throughout the ages. Some rhetoricians view ethos broadly, including the person as well as particular speech; while others interpret it more narrowly, limiting it to each individual speech. Socrates looks at Nixon's speech from his point of view and issues his judgment that Nixon was not an ethical speaker, not only because he lied, but also because he used national security as an excuse to lie. Because Socrates would not even escape from prison to save his own life after being sentenced to die, he would not likely agree with Nixon's use of the national security excuse to break the law.

Medical Marijuana and the First Amendment

Mike Novak
Dr. Karen Speckman, Faculty Mentor

This paper shows that the government has violated the First Amendment rights of the citizens of the United States of America by not allowing them an opportunity to petition the government for rescheduling and legalizing marijuana and the First Amendment rights of doctors by threatening them if they give their honest opinion on medical marijuana. The researcher examined the National Organization for the Reformation of Marijuana Law's attempt to reschedule marijuana, current law, bills on the floor in the House of Representatives, and state court cases. The First Amendment guarantees individuals the right to speak openly and

the right for citizens to petition the government where they see a grievance. The federal government violated these two aspects of the First Amendment by attempting to silence doctors and not allowing for the rescheduling of marijuana.

Jon Benet and Girl X: A Comparison of Media Coverage

Tom Osgood
Dr. Mike Chanslor, Faculty Mentor

The extent of media coverage around certain events in the last few years has, ironically, generated much debate over how much bias exists within the mass media. This study attempts to shed some light on the controversy by comparing the coverage of two similar incidents: the Jon Benet Ramsey murder in Colorado in December 1996, and the January 1997 Girl X physical and sexual assault in Chicago. Newspaper articles about the cases in the *Denver Post*, *Chicago Tribune* and *Chicago Sun-Times* within one week are examined in regard to tone, content and extent of coverage. The study also suggests reasons for possible disparities in media attention.

You're Wasting Your Time and the Environment: A Persuasive Speech

David Rogers
Dr. Martha Bartter, Faculty Mentor

This persuasive speech urges one to save time, energy, money, and the environment. Stop post-consumer recycling! There are numerous alternatives to current recycling practices that are being ignored. For several years now we have spent countless hours sifting, sorting, and cleaning our trash. This process is far less valuable than we have been told. We are not in danger of depleting resources: we are not running out of landfill space; we are wasting hundreds of millions of dollars. Recycling in the future should involve less waste and fewer wasted resources. It is time for people to reevaluate their environment-saving techniques to reduce, reuse, and re-think.

Intercultural Sensitivity as seen in A Lesson Before Dying

Julie Rupp

Dr. Closepet ramesh, Faculty Mentor

Intercultural sensitivity describes the activity to recognize and accept differences in people from different cultures. Milton J. Bennett's model of intercultural sensitivity is applied to Ernest J. Ganyes' book, *A Lesson Before Dying*. It will be used to see how Grant Wiggins, the main character, grows and changes his feelings towards members of other cultures and races, mainly Caucasian.

Oral Interpretation of "Bullet in the Brain" by Tobias Wolff

Sarah Shmigelsky

Kirsten Olesen, Faculty Mentor

We have all had our patience tested in life. It is easy to become easy to become extremely irritated by those around us. As consumers we must stand in line and wait our turn. The day to day routines can wear our nerves thin. As you wait, do the words and thoughts fill your head, do the words and thoughts fill your head, does the voice of sarcasm ring in your hears? For the character this story, this voice of sarcasm explodes in his face and turns his life into a face fading memory. "Bullet in the Brain," a short story by Tobias Wolff, appeared in the September issue of the *New Yorker*.

Disclosure of Private Facts and the Newsworthy Defense

Missy Sieren

Neil Ralston, Faculty Mentor

This paper discusses the use of the newsworthy defense in invasion-of-privacy lawsuits. This defense allows a reporter to reveal private facts about an individual if he or she is considered a "newsworthy" person. This paper will try to prove that the newsworthy defense protects reporters and individuals not in the public eye. This paper will attempt to prove this by citing examples in which the newsworthy defense was used. There are three legal theories of newsworthiness that help one understand the newsworthy defense better. The Black-Douglas Doctrine supports full protection for the press. Emerson's Definitional Approach favors a full protection of an individual's right to privacy. The Meiklejohnian Standard favors full protection of the First Amendment, the public's right to know.

Hot Air Rises, Especially Below the Mason-Dixon Line

Willie Smith

Dr. Michael Chanslor & Dr. Keith Doubt, Faculty Mentors

This analysis of several magazines and twelve articles from magazines spans variety of audiences. The topic of the research was the media's coverage of the southern church fires through 1996. The sources were *The Wall Street Journal*, *Jet*, *Editor and Publisher*, *Christian Century*, *Columbia Journalism Review*, *U. S. News and World Report*, *Newsweek*, *Village Voice*, and *Commentary*. The paper documents how the coverage of the fires metamorphosed from concerned interest to a live-feed trial by media. It documents the shift in coverage from reporting the occurrences of the fires to investigative reporting and examines the varying perspectives of the periodicals. Finally the paper looks at other factors outside of the ones covered in the popular press that may have contributed to the incidents.

Titanic: The Myths of 1912

Keri Watson

Dr. Jack Hart, Faculty Mentor

Walter Lord's *A Night To Remember* (1955), gives a detailed description of the Titanic disaster, and the emotions and feelings of the people involved. 1912 was not only a different era, but a different world. The Titanic affirmed a much older myth in that people commit folly when they view themselves superior to God and nature. I looked at the reactions of the people involved through mythic criticism. Great transportation disasters have gone as far as to change our entire outlook on life. Because emotion plays such an important role in forming myth, the tragedy of such a disaster has a very powerful effect. In a time in which hopes soared and confidence flourished, it is an excellent example of a previous myth that our society once held.

Television Coverage in the Courtrooms

Christiana Yiangou

Dr. Karon Speckman, Faculty Mentor

Media coverage of high profile trials (e.g. Timothy McVeigh, O.J. Simpson, Joel Steinberg, and William Kennedy Smith) has been severely criticized. Critics maintain that the images linger with the viewers and that opinions change because of these coverages. Television coverage may be robbing the accused of a fair and impartial trial. Research reveals that the effects of television coverage are different when the coverage is continuous as contrasted with partial newscast reporting.

Campus Crosswalks

Angela York,* Jennifer Sigman and Ben Douglas
Gary Jones, Faculty Mentor

An awareness campaign concerning the need for more campus crosswalks was conducted in the spring of 1996. This need for the campaign was determined by the results of a survey that showed 80 percent of students never used crosswalks. The goals of the campaign were to add eight crosswalks to campus and change the two existing campus crosswalk lights to flashing yellow signals. The latter goal was made because pedestrians are at fault if a car hits them and the crosswalk button is not activated. The campaign generated coverage in the *Index*, *The Kirksville Daily Express*, KTUF, KRXL and KNEW. We met with Scot Wrighton, city manager, who approved all eight sites, plus an additional five. The plan for thirteen new crosswalks and two flashing yellow signals was proposed to the City of Kirksville and approved.

Education and Traditions: Classical Learning and the Liberal Arts

Erasmus, Cicero, Quintilian, and the Value of Classical Literature

James A Gioia
Dr. Kreps, Faculty Mentor

The project to be undertaken shall explore the extent to which Erasmus, Cicero, and Quintilian relied upon classical literature in their educational systems. Special attention shall be given to their primary works on education: *De Ratione Studii*, *De Oratore*, and *Institutio Oratoria* respectively. Within the tradition of liberal arts education, Erasmus, Cicero, and Quintilian have contributed a great deal. Each held firmly to the notion that the liberal arts education contributed significantly to the formation of sound character in the students. Furthermore, each argued that the study of classical literature was one of the main sources for developing that soundness of character. Thus they all professed a similar goal and method with regards to the liberal arts education. An examination of these authors and texts will present clear evidence for a continuation of the classical liberal arts into the Renaissance.

Classics in Twentieth-Century America

Michael Johnson
Clifton Kreps, Faculty Mentor

Historically, American higher education has professed two main goals. One aims at the acquisition of job skills, the other seeks to form competent citizens through exposure to the Liberal Arts. Recently, the former, more modern goal has increased in importance at the expense of the latter, more traditional one. This trend especially affects Classics. In the early 20th century, Classics was required of nearly every student. In the latter half, however, Classics has lost its importance, for many see it as unessential for education and in direct competition with the occupational view of education. I will analyze the deemphasis of Classics in the past century and question the assumptions responsible for this phenomena. I will argue that from either the occupational or liberal arts perspective Classics can play a vital role in American higher education.

A Protagorean Analysis of “Protagoras”

Jonathan Morris
Dr. Clifton Kreps, Faculty Mentor

In my paper, I analyze the Platonic dialogue “Protagoras” in order to study Plato’s view on education. The method is twofold. First, through a study of surviving fragments of Protagoras and contemporary or near contemporary writers who wrote of Protagoras, I find the background necessary to consider Plato’s comparison of didactic and dialectical education. Secondly, I look for evidence for Plato’s awareness of problems in the philosophy of language, including the difficulties inherent in written communication. I argue that in this dialogue Plato proposes a solution, the dialogue, as a maximally perfect form of education.

The Acceptance of the Classical Tradition within the Medieval Monastic Institutions

Christopher J. Palo
Dr. Clifton Kreps, Faculty Mentor

The early apologists and fathers of the Christian religion were very openly critical of the culture of antiquity. Many of the works of such apologists as Tertullian contain anti-references, indicating that Greco-Roman civilization was inherently incompatible with Christianity and Christian Doctrine. More notable examples of such hostility are found in St. Jerome and St. Augustine. However, these last two, especially Augustine, would make appeals to use and incorporate the pagan culture of Greece and Rome for the betterment of Christianity and its followers. This turn about did not

take place quickly, but over a period of time Classical Culture found its way into the Medieval education system, which, at the beginning of the Middle Ages, was centered at the monasteries. It is the intention of this research to examine how and why such an openly hostile attitude towards GrecoRoman society would eventually move to one of greater acceptance. The role Classical Culture played in early monastic education will also be examined, with particular emphasis on the rise of the Benedictine Monasteries from the sixth to the early eighth centuries. With this in mind, it is possible to conclude that the early Middle Ages were a time of learning and scholarship which did indeed preserve, though selectively, Classical Culture; a view which the Renaissance humanists and thinkers of the Enlightenment did not hold.

Alexandrian Apex: The Great Library and the Greco-Roman Literary Tradition

Heather Tylock
Dr. Clifton Kreps, Faculty Mentor

This paper investigates the transfer of literary thought and culture from Greece to Rome during the Hellenistic era, with particular focus upon the Library at Alexandria. The Mouseion, also known as the Great Library, was founded by Ptolemy I Soter, who reigned in Egypt from 323-285 B.C. The library, located within the confines of the royal palace, provided a forum for the expansion of thought through the study of mathematics, science, history, philosophy, geography, art, astronomy, medicine, and literature. The Mouseion at Alexandria housed some five hundred thousand scrolls, as well as lecture halls, laboratories, and observatories. This study examines the intellectual transmission of literary thought by examining certain Roman authors, such as Virgil and Catullus, and their reliance upon the efforts of the Alexandrian scholarly community.

Millennium Panel

American Foundations Panel:

For the last 12 years, a select group of Truman students in the humanities have gone down to North Carolina every summer and attended American Foundations, an intensive course in American Studies team-taught by scholars in literature, music, history and art history at the Reynolda House Museum of American Art (affiliated with Wake Forest University). The kind of interdisciplinary scholarship we are groping for at Truman with the LSP (and which some faculty believe is in fact impossible) is a realized tradition at Reynolda. These papers will show you how it's done!

The Millennium Panel:

These papers, resulting from a Comp II Special Topics class, should help the audience get ready for media hype that will transcend any Washington sex scandal: the coming millennial shift. Will it arrive on January 1, 2000 or January 1, 2001? Since Herod died in 4 B.C., according to Biblical scholars, and there was no year zero on the calendar, did it arrive this new year's day? All this and much more: we'll touch almost every discipline, and discuss everything from Mad Cow Disease through the Book Of Revelations to the Protocols of the Elders of Zion and militia conspiracies. Be prepared for what lies ahead in all its glory/banality....?

The Protocols of the Elders of Zion: The Propagation of a Lie

Matthew J. Goyer, Matt Rizzo
Dr. Robert Mielke, Faculty Mentor

At the turn of the century, The Protocols of the Elders of Zion were used by antisemites as evidence of a global Jewish conspiracy to dominate the world. This document was used by French officials as evidence of guilt during the Dreyfus Affair, and was also used by Russian Secret Police to convince Czar Nicholas II to resist democratic reforms. In 1920, the Protocols were published publicly for the first time in English, Russian, French, German, Swedish, and Finnish. As early as 1921 the Protocols were proven to be a forgery by Herman Bernstein, yet eighty years later conspiracy groups continue to cite them as doctrine. This will continue as a good conspiracy will never die, no matter the circumstances.

Beyond Faith

Jeff Sahaida
Dr. Robert Mielke, Faculty Mentor

Perhaps the most important and vital element to anyone of religious faith is their Holy Scripture. However, can one take their sacred words and place them in a literal context, or must one only live by the overall moral and ethical message. In Christianity, The Book of Revelation, by St. John the Divine, presents its readers with an interesting dilemma for it is an account of how our earthly world will come to its end. For centuries, since the Book was written, people have been awaiting the end of life and looking to signs of war and plague as indicators of John's written end. There is, however, much evidence that the Book of Revelation is not a literal source or a check-off list of apocalyptic signs. Based on a wide range of historical facts, St. John's Book of Revelation can be best understood as a historic document in which people today can find meaning and relevance.

P-Eye

Leah S. Dudley
Dr. Robert Mielke, Faculty Mentor

As the millennium approaches, many humans are beginning to wonder what it will hold. Carl Sagan explores one possibility in *Contact*. Ellie Arroway, a dedicated physicist, discovers an anomaly in a radio frequency coming from a star system known as Vega. This leads to an eventual meeting between humans and another sentient race. In the book and movie, there is an underlying conflict between science and religion. I argue by interpreting Sagan's work and correlating this with the images of Jeanne d'Arc and the religion of Pythagoras that science will dominate and improve upon the traditional Judeo-Christian religion.

Better Save than Sorry: Preventing the Spread of "Mad Cow Disease" in America

Jennifer Bell
Dr. Robert Mielke, Faculty Mentor

The recent, startling outbreak of "mad cow disease" among British cattle has resulted in strict regulation from the United States Food and Drug Administration regarding the processing of ruminant feed. These regulations simply don't go far enough. Ruminants, such as cattle and sheep, have, in the past, been fed protein-meal composed of the parts of other grazing animals. This dangerous practice, which is thought to be capable of passing on diseases known as transmissible spongiform encephalopathies, is currently tightly controlled. Unfortunately, lack of sufficient research has prevented additional, necessary precautions from becoming policy. These essential procedures include eliminating swine, poultry, and equine products from the feed, as well as ending the practice of feeding possibly contaminated meal to these non-ruminant species.

Mythology

Creation Myths

Liz Amann, Buddy Entwistle, Kim Mannion, Robin McKee, Ben Swoboda, Jason Thompson, Angie Zahner
Betsy Otten Delmonico, Faculty Mentor

Myths encode core values of the cultures which produce them in language which can be read as sustained symbolism. After analyzing myth structures and metaphors from a wide range of cultures, students in Mythology used the vocabulary of myth to construct creation stories which reflect some of their own culture's core values. Students will read and discuss portions of the myths they created.

The Beginnings of the World

Jason Thompson
Dr. Elizabeth Delmonico, Faculty Mentor

Over the centuries, mankind has universally sought to explain its existence and origins. Many different methods are used to this end, but the most common and basic form is the cosmology. With this "creation myth" a given society can comfortably live with the ideas which have always plagued the minds of thinkers; things which cannot be explained. This paper is an original cosmology drawn from the imagination of the author, and some of the more prominent creation myth archetypes. Set in the form of a father teaching his son the ways of a spirit leader, this paper relates the origins of man, the world, and some of the more prominent aspects of human life.

Math & Computer Science

Groups of Order Less than or Equal to 12: Their Properties, Representations, and Character Tables

Amy Berg
Dr. Deborah Denvir, Faculty Mentor

When studying groups in mathematics, it is helpful to have a way of organizing the information into a complete picture. The character table is useful in that it gives the generators, elements of a conjugacy class, and all of the irreducible representations of the group in one complete table. In this presentation we will look at the dihedral groups of orders eight, ten, and twelve and their character tables. The other groups of finite order discussed in my paper include some of the cyclic groups, the cross products of the cyclic groups, the quaternion group, the alternating group, and a group W of order 12.

The Finite Subgroups of SO_3

Jill Ralph
Dr. Deborah Denvir, Faculty Mentor

This research project focuses on various aspects of the finite subgroups of SO_3 . These finite subgroups, namely the cyclic, dihedral, tetrahedral, octahedral, and icosahedral, are subgroups which have much to offer in the study of algebraic structures. SO_3 is itself a subgroup of an orthogonal group O_3 . SO_3 only contains orientation-preserving orthogonal matrices. By using the counting formula, these finite subgroups can be classified and several can be shown to correspond to the platonic solids: the tetrahedron, cube, octahedron, dodecahedron, and the icosahedron. In this presentation, the formula will be applied to a couple of these figures to understand the structures of the groups. The presentation will also include a short sketch of the classification theorem of these finite subgroups of SO_3 .

Investigation of the Near Geometric Property of Bifurcation Cascades in Final State Feigenbaum Diagrams.

James Riley
Dr. James Denvir, Faculty Mentor

The dynamics of chaotic systems depends highly on the equation that is iterated to produce it. There exists a variety of equations that will produce chaos if iterated with the right parameters. Small initial parameters produce a single attracting point. As the initial parameter is increased this period 1 orbit splits and produces an orbit with the cycle being the next power of 2, and this series of bifurcations continues until at a certain parameter total chaos has set in. The initial parameters that indicate bifurcation points follow a near geometric series based on the Feigenbaum constant. It is the relation of these bifurcation points and the actual points of the geometric series for several different iterating equations that has been numerically investigated with computer programs that will be discussed.

Science

A Study of the Formation of Fluorescent Dimers in Aluminum Chloride/1-Ethyl-3-Methylimidazolium Chloride Room Temperature Molten Salts.

Amy Abbott* and Eric Schreiter*
Dr. Griff Freeman, Faculty Mentor

Room temperature molten salts are interesting chemical systems because they have a viscosity that is intermediate between the solid state and normal aqueous solutions and the acidity/basicity of the 1-ethyl-3-methylimidazolium chloride (MEICl)/AlCl₃ salts can be altered by changing the mole ratio of MEICl to AlCl₃. As such, room temperature molten salts are a class of potentially unique solvents for a variety of chemical reactions. Fluorescence is a widely used and sensitive spectroscopic technique that can be used to provide both qualitative and quantitative information about chemical systems. This technique makes it possible to examine certain characteristics of salt systems. We will present fluorescence excitation spectra and fluorescence emission spectra of molten salts that demonstrate the formation of dimers at the concentrations used to form the salts. In addition, spectra of MEICl in acetonitrile also indicate that dimers of the MEICl are responsible for the observed fluorescence features.

Quantitative Determination of Ethanol Levels in Serum Samples by High Performance Capillary Electrophoresis

Stacy D. Arnett
Dr. Yinfa Ma, Faculty Mentor

The need for analyzing ethanol content in blood for health reasons and for enforcing safety in driving provides demand for automation in ethanol determination. Although other instrumental methods have been developed, the complicated pre-treatment of samples involved in these methods may cause problems for analysis. Therefore, a simple and sensitive method has been developed for automatic determination of ethanol levels in human blood using high performance capillary electrophoresis (HPCE). HPCE provides advantages over other separation techniques because of its high speed, efficiency, and simple automation. The pre-treatment of serum sample conditions affecting the separation and quantitation will be presented

SCIENCE

Effects of Yeast inclusion in ad libitum Trace Mineralized Salt on Cow and Calf Performance

Wehner, G.R.1, Brokaw, L.*1, J.E. Garrett2, J. Zidon2
Dr. Glenn Wehner, Faculty Mentor

Eighteen Gelbvieh cow-calf pairs and twelve non-lactating Gelbvieh cows (all purebreds) were assigned to yeast (Diamond V XP, Diamond V Mills) or control treatments by initial cow weight (COWW). Cow and calf weights were obtained every 28 days for 84 days. Cow body condition scores (BCS) were evaluated at the start and end of the trial. Yeast was included in ad libitum trace mineralized salt to deliver an average of 28.3 g/hd/day of yeast and controls received only Vigortone 32-S mineral mix. Pairs were rotationally grazed (moved every seven days) on mixed pastures within treatment groups for the duration of the trial. Calves were creep fed a pelleted supplement (12%CP-68%TDN) starting fourteen days into the second period until the end of the trial. Yeast cows gained 15.0 kg. (p<.08) more weight than controls in Period 1 but lost 17.6 kg. more weight (p<.02) in Period 2. Weight loss (average 5.4 kg.) was not different (p>.36) for Period 3. Weight loss in treatment cows was probably due to greater milk production (MP) as compared to controls. Yeast group calves gained 3.2 kg. more than controls (p>.3) during the trial. Control calves compensated for lower cow MP by consuming 40% more creep feed than yeast group calves. Treatment cows maintained higher BCS (p<.05) than control cows. Yeast inclusion tended to increase MP and maintain calf gains while sparing creep feed.

Placebo Treatments and Musculo-skeletal Pain: A Historical Overview

Eric Chatt
Dr. Philip Wilson, Faculty Mentor

Research in mind-body medicine has provided myriad examples as to how the nervous and immune systems are intricately interwoven. Significant effort has been expended in attempt to analyze both the mental and physical components of pain. This project focuses on the historical development of different therapeutic modalities used to treat musculo-skeletal pain. Particular emphasis is placed upon the efficacy of various placebo treatments and relatedly, the extent to which a patient's belief, anxiety, hope, and physician perception affect the outcome of the treatment. The integration of various physical treatments for pain (e.g. Osteopathic Manipulation) are discussed as well as the interdisciplinary approaches that are currently being used in pain clinics. Scientific research is being conducted to help better understand the mechanisms of placebo analgesia. This presentation will address the use of placebos in research, and the inherent difficulties that arise in effort to quantify the placebo response.

A New Modular Laboratory Format for Introductory Biology

Kelly Donovan and Karen Roberts
Dr. Nancy Sanders, Faculty Mentor

Biology 107 provides a general overview of many key concepts in the biological sciences. Previously, the laboratory component of the course did not correlate well with the lectures, and there was little continuity from week to week amongst the labs themselves. In an attempt to create a more meaningful laboratory experience for the students, a new, more cohesive format is being developed. This new lab format is comprised of four modular style labs each focusing on a different major concept in biology. Through field observations and experimentation, we are testing and revising a four week lab series for the “pond module,” focusing on diversity and adaptation. We are also beginning to develop other modules using exploratory and investigative techniques to avoid making these experiments “cookbook.” These modules will provide the beginnings of a framework which the students can build upon and then carry with them throughout their biological careers.

An Efficient Method for Measuring the Modal Frequencies of a Clarinet Reed

Paul R. Downing
Ian M. Lindevald, Faculty Mentor

A new method for measuring modal frequencies of clarinet reeds was developed. Its enhanced efficiency allows us to compare the modal characteristics of many reeds. In this method a laser beam is dispersed by a small piece of reflecting tape attached to a vibrating reed. A sensor detects the fluctuations in the reflected light which are displayed on a spectrum analyzer. Spectral peaks identify modal frequencies. By driving the reed with white noise, all of the reed modes can be detected in one shot. Three reeds studied with a prior inefficient method have been remeasured using the new protocol. The new method is successful in finding all of the modes previously discovered, but modal frequencies obtained with the new method are lower due to the mass loading of the reed by the reflective tape. Typical reed characteristics based on these and more recent data will be presented.

The Space Distribution of Nearby Galaxies

James Duran
Dr. Mohammad Samiullah, Faculty Mentor

Einstein’s bold idea that the universe is homogeneous in the large-scale average is termed the “cosmological principle”. An understanding of the clustering of nearby galaxies is an important

measure of how closely the large-scale mean distribution can approach the homogeneity postulated in the cosmological principle. As a test of the homogeneity of the space distribution surrounding our own galaxy, we are trying to input previously mapped coordinates of nearby galaxies into a computer program developed to convert the data into three-dimensional plots. Examination of these plots gives a better understanding of the homogeneity of surrounding galaxies and the universe.

Determination of the Chloroplast *rbcl* Gene Sequence in *Pleopeltis polypodioides* in Order to evaluate its Position in the Genus *Pleopeltis*

Amv B. Foraker
Dr. Elisabeth A. Hooper, Faculty Mentor

Much controversy has resulted from the recent transfer of the scaly-leaved resurrection fern from the genus *Polypodium* to the related genus *Pleopeltis*. This transfer was based on morphological data as well as preliminary evidence for genetic similarities between several scaly-leaved *Polypodium* species and *Pleopeltis*. In my study, I tested the hypothesis that the resurrection fern (*Pleopeltis polypodioides*) is genetically more similar to *Pleopeltis* than to non-scaly-leaved species of *Polypodium*. By sequencing the chloroplast *rbcl* gene of this fern, and comparing the sequences to other members of *Polypodium* and *Pleopeltis*, I was able to support the theory that the resurrection fern truly belongs in *Pleopeltis*. (Clarion University, Clarion, PA; Participant in Truman’s summer NSF-REU program)

Quantitative Analysis of Cations in Soil Samples by HPCE

Jason Gruenhagen
Dr Yinfa Ma, Faculty Mentor

The concentration of many different cations in soil is of vital importance not only in agriculture, but also in many other fields, including botany and pollution control. Thus, a quick and accurate technique for measuring these cation concentrations is needed. One such technique has been developed using high performance capillary electrophoresis (HPCE). HPCE has many advantages when compared with other techniques, such as HPLC, ICP, and AA, which have traditionally been used. HPCE uses very small sample sizes, allows for quick and easy detection, and has a very low limit of detection. The detailed separation which allow for cation analysis will be presented

Attack Behaviors of Arrowworms

Gwen Habel and Sakima Smith
George Shinn, Faculty Mentor

Chaetognaths are planktonic marine worms that eat small crustaceans. They detect waterborn disturbances created by prey movements and capture prey using movable chitinous grasping spines located on the head. *Parasagitta elegans* in a 5 liter aquarium were fed brine shrimp nauplii or mixed plankton; prey capture was recorded using videography. In all cases (n=100) arrowworms were motionless just prior to attacks. These occurred after prospective prey became positioned alongside the arrowworms. Attacks involved rapid flexing of the body. Chaetognaths employed several distinct types of flexures, depending on the location of the prey around the body. These observations provide new insights into the functional design of the chaetognath body. Contrary to expectations, chaetognaths did not actively pursue prey by forward swimming and encounters with potential prey during swimming did not lead to attacks.

Copepod Behaviors Leading to Predation by Arrowworms

Gwen Habel
Dr. George Shinn, Faculty Mentor

Arrowworms (Phylum Chaetognatha) are planktonic, predators that capture copepod prey. These are detected by ciliary mechanoreceptors scattered over the body surface. The worms hang motionless in the water, and attack by rapidly flexing the body. Videography and frame-by-frame analysis reveals that chaetognaths attack copepods performing various behaviors including rapid hopping (24-134.4 mm/sec), slow swimming (1.2-9.9 mm/sec), and hovering. Attacks almost always occur as copepods approach the worms (n=26, 96%). These observations suggest that the mechanoreceptors detecting prey are sensitive to several types of water-born disturbances and that the disturbances are propagated in front of the swimming prey.

Gadolinium-Induced Inhibition of Calcium Channels in Apoptotic B16-F1 Melanoma Cells

Christopher M. Hanff and Dr. James Cox
Dr. James Cox, Kirksville College of Osteopathic Medicine, Faculty Mentor

Recent investigations into the role of intracellular calcium ($[Ca^{2+}]_i$) suggest a causal relationship between an increase in $[Ca^{2+}]_i$ and subsequent induction of apoptosis. It is not clear whether apoptosis-related $[Ca^{2+}]_i$ increases are solely mediated from intracellular stores, such as from the endoplasmic reticulum, or whether influx of extracellular calcium is involved. Early events in the pathway of apoptosis are poorly understood as of yet, especially concerning calcium's role throughout this process.

This author's research was aimed at investigating the induction and suppression of apoptosis under conditions of calcium channel inhibition by gadolinium. Two different treatments that induce apoptosis, in potencies low enough so as not to cause necrosis, were implemented on B16-F1 cells. Twenty minutes of UV-irradiation at 254nm yielded 50% apoptotic cells. $3\mu M$ of sphingosine produced 80% apoptotic cells. Results of the above treatments, both with and without gadolinium will be reported.

Comparison of Small Quantity Plant DNA Extraction Techniques

Steven E. Hanson
Dr. Stephanie A Foré, Faculty Mentor

The extraction of DNA from the leaf tissue of plants is very useful in determining the genetic variance among a population. Obtaining a high yield from a small quantity of leaf tissue is very important because often we do not have very much tissue to work with, and we need a method for extraction that will be extremely efficient. Using three versions of the Doyle and Doyle CTAB method of plant DNA isolation, we attempted to discern which version was most efficient at isolating DNA from small quantities of leaf tissue. The efficiency was based on the quantity of DNA isolated and the amount of time to complete the procedure. The CTAB extraction procedure currently used in our lab had the highest yield of the three. Despite being the longest procedure, it consistently had significantly better yields. The other methods, although faster, did not have good reproducibility and yielded much smaller amounts of DNA.

Amino Nitrile - From a Batch to a Continuous Reaction

Jay Hendren
Dr. Dana Delaware, Faculty Mentor

Converting a batch reaction into a continuous reaction can have great industrial significance. It could increase the amount of product made in the same amount of time. A continuous reaction could also be put at the start of another reaction train eliminating several steps in the process. The project for the third and final co-op with American Cyanamid Co. was to study the production of amino nitrile. The existent batch reaction had to be completely understood before it could be switched to a continuous reaction. This involved developing a safe and efficient way to produce hydrogen cyanide. It also involved an extensive kinetic study of the batch reaction.

Establishing an Ethical Construct in College Chemistry Majors. V. Reciprocal Development of Chemistry Professors.

Aaron J. Huckstep*, Brian T. Alferman, and Shane W. Lager
Dr. Roger R. Festa, Faculty Mentor

The college chemistry professor becomes an effective advisor of chemistry majors through conscientious application of student development theory in his or her interactions with students. These interactions occur on both the professor's "turf" (i.e., the culture of North American academic chemistry as preserved and practiced in the chemistry department) and the students' "turf" (i.e., the campus community and the student culture, including co-curricular activities of the students). This paper proposes several methods, grounded in adult development theory and professional development standards, which enable chemistry professors to enhance their professional development through their interactions with chemistry majors on the students' "turf" in various campus sectors and through cooperative participation with chemistry majors in programs both within the chemistry department and in other sectors of campus life.

Separation of DNA Restriction Fragments Using Capillary Electrophoresis in Entangled Polymer Solutions

Bryan Huynh
Dr Yinfa Ma, Faculty Mentor

The separation of DNA fragments has great significance in many chemical and biological studies. One method to separate DNA fragments is through the use of capillary electrophoresis (CE) in entangled polymer solutions, a technique that provides a fast and efficient way to separate DNA restriction fragments of up to 12 000 bp. However, intercapillary DNA sieving matrices are being actively sought to improve CE analysis. In this study, electrophoresis experiments employing different polymer solutions of varying polymer lengths are used for the optimum resolution, reproducibility, cost effectiveness, and ease of DNA fragment separation. The findings and results will be presented.

Construction of a Thermospray Nebulizer for Sample Introduction for the Direct Current Plasma

Tracy Kelly
Dr. David McCurdy, Faculty Mentor

Sample introduction has remained an impasse that must be overcome in atomic emission spectroscopy, in particular with the Direct Current Plasma (DCP). The purpose of this project was to construct a high efficiency thermospray nebulizer (TSP) for sample introduction of liquid microliter sized samples into the pop. The second goal was to optimize the operating conditions for both the TSP and the pop. For the operation of the TSP, the optimum TSP probe temperature, flow rate of liquid, flow of nebulizing gas, and its potential for flow injection analysis will be discussed. The conditions for the pop that are important involve plasma conditions, position of the thermospray tip relative to the pop, and the necessity of a desolvation system.

Genetic Variation in Patches of *Vaccinium stamineum* L.

Scott Kreher
Dr. Stephanie Foré, Faculty Mentor

Vaccinium stamineum L. is a shrub of rocky or sandy, xeric woodlands. In the Sandhills habitats of the Carolinas, this species grows in distinct patches. As this species reproduces both sexually and asexually, it is unknown if a patch represents a single clone or multiple genets. We collected genetic data from patches and

conducted random amplification of polymorphic DNA (RAPD). RAPD is a Polymerase Chain Reaction based technique in which arbitrary nucleotide primers anneal to and amplify regions of DNA. Genetic variation can be inferred from the presence or absence of the amplified DNA product among individuals. Preliminary data analysis of eight polymorphic loci resolved from one nucleotide primer indicated that over half of the patches sampled had more than one genes. From this data we suggest that multiple seedlings have established in these patches.

A Developmental Study of Pollen and Anther Morphology in the American Lotus (*Nelumbo lutea*, Nelumbonaceae)

Sarah S. Kreunen
Dr. Jeffrey M. Osborn, Faculty Mentor

Nelumbonaceae is a small family of aquatic flowering plants, comprised of two species, *Nelumbo nucifera*, the Indian or sacred lotus and *N. lutea*, the American lotus or water chinquapin. *Nelumbo* and closely related waterlilies are believed to be among the most primitive angiosperms. Evolutionary relationships among plants can be assessed through studies of pollen and anther development, however, little has been known about these important biological aspects in *Nelumbo*. The focus of this presentation will be these events which have now been morphologically documented utilizing scanning electron microscopy, transmission electron microscopy, and light microscopy. A complete developmental sequence has been documented that includes anthers at the sporogenous tissue, microspore mother cells, tetrads, free spores, and mature pollen grain stages. Additionally, ultrastructural details of the development of the exine and intine layers of the pollen wall will be shown. This is the first study to utilize electron microscopy to examine these reproductive events in *Nelumbo*.

Computational Studies of Theoretical Reactions of Alkyl Halides with Oxygen

Jason B. Lindley
Jonathan E. Stevens, Faculty Mentor

Recent experiments have shown that the O (3P) atom reacts with certain alkyl halides to produce products which may play a role in stratospheric ozone depletion. Such reactions may take place via a "spin-forbidden" intersystem crossing mechanism in which the spin of an electron changes direction. This phenomenon will be explored for the reaction between O (3P) and 1,2-dibromo-ethane. The *ab initio* molecular orbital theory of electrons in molecules will be used to determine the relative energies of reactants and products barriers to reaction pathways and the probability of a "spin-forbidden"

intersystem crossing. From this information the researchers will determine the probability that the reactions investigated will occur.

Phenotypic Analysis of a mutation that affects Embryonic Development in *Drosophila melanogaster*

Jennifer Littig
Dr. Janna McLean, Faculty Mentor

We have been studying a mutation in the wildtype *Segregation distorter* (Sd+) locus of *Drosophila melanogaster*. Female flies that are hemizygous for this mutation lay eggs that are fertilized, but never fully develop. Using DAPI, a DNA specific fluorescent stain we observed that the nuclei of embryos from the hemizygous mothers did not show a synchronous pattern of division like control embryos. The nuclei were also extremely disorganized. Our observations also showed that the embryos die within the first hour after fertilization. Those embryos laid by wildtype females crossed to the males for this mutation are completely normal.

Henry VIII: Examining a Royal Death Bead

Erin M. Loos
Dr. Philip Wilson, Faculty Mentor

In Sixteenth Century England, Henry VIII was known for his desires of the flesh and feast. Over the past few centuries, historians have speculated which one, if either, caused the King's demise. His wide array of physical ailments, stigmatic signs and psychological instability have been diagnosed as manifestations of a myriad of maladies ranging from scurvy to syphilis. My research examines and attempts to interpret the medical information surrounding King Henry's undetermined ailment. In a time of absolute monarchy, it is questionable whether the King's poor health status affected either his separation from the Church or his marital misgivings.

Effects of flock composition on foraging behavior of American Tree Sparrows, *Spizella arharea*

Brady Mattsson
Dr. Peter Goldman, Faculty Mentor

Animals foraging in groups may have decreased risk of predation and increased feeding efficiency compared to animals foraging alone. Foraging behavior in mixed-species groups has been investigated in shorebirds, seabirds, insectivorous birds and captive seed-eating birds. To study the consequences of mixed flocking, we

observed American Tree Sparrows at seed-baited sites at the Truman State University farm during winter months. We videotaped tree sparrows in flocks composed of only their species and in flocks containing both tree sparrows and Dark-eyed *Junco hyemalis*. Juncos displaced tree sparrows more frequently than tree sparrows displaced juncos, indicating that juncos are dominant to tree sparrows. If mixed-species flocking imposes a cost to tree sparrows, then their pecking rates may be lower in the presence of juncos. Preliminary data analysis shows significant differences in pecking rates for tree sparrows foraging with and without juncos, indicating that tree sparrows may endure some cost from mixed-species flocking.

Study of the Relationship of Frictional Surfaces

Kelly McGuire and Skylar Martin
Dr. Mohammad Samiullah, Faculty Mentor

The coefficient of static friction is the ratio of the maximum static friction force to the normal force, and depends upon the physical properties of the interface of the two surfaces. The value for any two given surfaces interacting must be determined by experiment. We studied how the coefficient is related to a theoretical model of two surfaces. Using sandpaper to control the uniformity of both surfaces, we determined the coefficient of static friction for varying grades of sandpaper and found a trend which can be understood with our model.

Analysis of Potential P Element Induced Suppressors of Segregation Distortion in Male *Drosophila Melanogaster*

Nathan J. McNcil
Dr. Janna McLean, Faculty Mentor

P-element induced suppressor mutations of Segregation Distortion have been propagated in 41 strains of flies. Our goal is to determine if the mutation is causing the observed phenotype. The P-element is equipped with the *Lac-Z* gene. Testes (where Segregation Distortion can be morphologically observed) of all 41 strains have been stained with X-Gal assuming that testis expressions would be necessary for a suppressor mutation. Genomic Southern blots of all fly strains are also being performed, using a portion of the P-element as a probe. Two other probes, corresponding to genetic elements include in Segregation Distortion, are also being used.

Aerodynamic Features of Saccate Pollen: Evolutionary Implications for Wind-Pollinated Plants

Ryan T. McWilliams
Jeffrey M. Osborn [Biology] and Ian M. Lindevald [Physics], Faculty Mentors

Pollen grains of many wind-pollinated plants have one to three air-filled sacs; these add considerable surface area, but minimal weight. However, there is no available research on how well the sacs of different species actually assist in flight. Using light and electron microscopy, I have examined saccate pollen of three conifers (*Pinus*, *Falcatifolium*, and *Dacrydium*) and documented multiple morphological characters. These include overall size, main body size, sac size, surface ornamentation pattern, wall thickness, wall infrastructure, sac infrastructure, overall mass, and wall mass. Some of these characters have been incorporated into a custom computer model, using the programming language C and *Mathematica*, that calculates flight properties for the theoretical grains. The model is being tested by stroboscopic photography of actual pollen. This is the first study to correlate structural and aerodynamic features of pollen, providing the opportunity to evaluate the adaptive significance of saccate pollen from both extant and extinct wind-pollinated plants.

Effects of Diet and Shearing on Growth Rate of Lambs

Tracey S. Mertens
Dr. Thomas E. Marshall, Faculty Mentor

Twenty-two Suffolk x Dorset crossbred lambs were assigned by sex and weight to one of two diets and one of two shearing treatments within each diet. Diets consisted of an 18.25% protein commercial feed (KENT) and a 13.02% protein by-product feed (MARI). The by-product diet consisted of 25% Marigold feed, 25% corn gluten feed, 25% soy hulls and 25% corn by weight. Shearing treatments consisted of a sheared (SHEAR) group and a non-sheared (WOOLED) group. Lambs were fed 86 days and were weighed weekly. Diet did not have a significant effect ($p > .05$) on the lambs gain. Kent fed lambs gained 38.6 lbs., and by-product fed lambs gained 34.1 lbs.. Shearing had a significant effect ($p < .05$) on lamb gain. Sheared lambs gained 39.1 lbs., while woolled lambs gained 33.1 lbs..

Meta-Analysis of Body Weight Dynamics in Small Mammals

Eric Meyer

Dr. Michael Tannenbaum, Faculty Mentor

A common response of small mammals to short photoperiod is a reduction in body mass, presumably with a concomitant reduction in metabolic cost to the animal. Results from our lab and the literature suggest that this is not the trend in the white-footed mouse, *Peromyscus leucopus*. A meta-analysis was performed on data from lab-born *P. leucopus* in controlled short photoperiod vs. long photoperiod conditions from six previously published papers. Similar analysis will be performed on data for *Peromyscus maniculatus* derived from the literature. The test statistics gathered from these analysis support the hypothesis that mice do not significantly lose mass in response to short photoperiod. Implications for overwintering success will be discussed.

A New Method for the Determination of Zinc in Blood Serum

Sheila Meyer* and Aaron Cassely

Dr. Yinfa Ma, Faculty Mentor

Zinc has undeniable importance in the human body, from its involvement in cell differentiation and replication to its interaction with hormones. Because zinc plays such an important role in human growth and development, methods to accurately measure zinc in small amounts of blood serum are needed. Currently, spectrophotometric analysis is used to determine zinc quantities in samples. However, interferences from copper and iron, plus a large sample size, limit the quantification reliability. These problems can be solved by high performance capillary electrophoresis (HPCE). This promising technique utilizes a small sample size (60 μ L for a single analysis) and eliminates interferences from other metals through separation. Since zinc does not absorb light, 4(2pyridylazo) resorcinol is complexed with zinc to fulfill the absorption capabilities.

Using Photomicrography to Monitor Growth of PC12 Cells

Heather Morgan

Dr. Cynthia Cooper, Faculty Mentor

The purpose of the study was to simplify monitoring the population growth of PC12 cells throughout exponential growth. Growth was measured by removing cells from their growth wells and counting them on a daily basis for six days. Using a camera to photograph the growth wells on each day will eliminate the need to culture each

day's cells in separate wells. Also, there will be no need to count cells immediately after removal from the well. Photos in this experiment were compared to find camera settings that would allow the most accurate counting of cells in the well. Results show that photos taken at 50X magnification may not be as accurate as the traditional counting method. Future experiments will alter the power of magnification, and therefore the field of view, in an attempt to increase accuracy.

Two Polyamine Inhibitors Alter Adenine Nucleotide Levels Differentially in PC 12 Cells

Hemal Patel

Dr. Cynthia Cooper, Faculty Mentor

Methylglyoxal bis(guanylhydrazone) (MGBG) and α -difluoromethylornithine (DFMO) are routinely studied for their anti-tumor effects. The impact of varying doses of MGBG and DFMO on energy metabolism was investigated in PC 12 cells. High Performance Liquid Chromatography (HPLC) was used to quantify the levels of adenine nucleotides in cells treated with one drug or a combination of drugs. During normal exponential growth specific adenine nucleotide (ATP and ADP) levels decreased while the energy charge did not change. However, exposure to varying drug doses revealed increasing nucleotide levels. MGBG increased the adenine nucleotide pool 2.9-fold, though it inhibited the growth rate 47%. The effects of combined drug treatment were driven by MGBG rather than DFMO (ATP pool increased 2.5-fold and growth rate decreased 70%). Current studies include a time course with a fixed drug dose and a recovery experiment to see if the effects of drugs on adenine nucleotides are reversible. Funded by National Institutes of Health and Truman Undergraduate Summer Research Stipend.

Laser Cooling and Trapping of Rubidium Atoms

Kevin Koch and Mark Pecaut

Dr. Maria Di Stefano, Faculty Mentor

Laser cooling and trapping is one of the cutting-edge areas in atomic physics where laser diodes have proven useful. Directing laser light at a gas, such as rubidium, that is tuned down from the gas' natural resonance produces a velocity-dependent force on the atoms and thus, contrary to intuition, cooling the atoms. If the atoms are placed in the presence of a non-uniform magnetic field, in turn they will experience a non-uniform force from the laser light that will trap them. We have constructed a trap which is inexpensive, small, and relatively easy to use. The physics of cooling and trapping will be discussed, as well as the experimental setup that we have built.

Quantitative Detection of Adenosine 5'-Triphosphate (ATP) by CE-IFD

Molly Roos
Dr. Yinfa Ma, Faculty Mentor

The quantitative detection of adenosine 5'-triphosphate (ATP) within a cancerous cell is important in many fields including oncology and biochemistry. The detection of ATP is necessary for upon the addition of experimental oncology drugs, the level of ATP within the cancerous cell has mysteriously increased. One such method used to calculate this increase of ATP is capillary electrophoresis with indirect fluorometric detection (CE-IFD). This study of CE-IFD utilizes a helium-cadmium laser and a fluorescent buffer to detect the non-fluorescent characteristics of ATP. The detailed method of detection and separation as well as results from ATP analysis will be presented.

Isolation of *Dictyostelium discoideum* Genes through Restriction Enzyme Mediated Integration

Bryan J. Schwent
Dr. Michael L. Lockhart, Faculty Mentor

The cellular slime mold *Dictyostelium discoideum* can be used as a model system for studying DNA repair because of its resistance to DNA damaging agents and its small genome. I attempted to isolate DNA repair genes from *D. discoideum* to help give a better understanding of its DNA repair processes. Restriction enzyme mediated integration (REMI) was used to insert the plasmid pDNeoll into the genome of the NC4 (wild type) strain of *D. discoideum*. These plasmid insertions acted as markers, tagging those genes that they interrupted. Transformant colonies were selected on the basis of G418 resistance. These transformant colonies were then screened for DNA repair mutant phenotypes based on increased ultra-violet radiation sensitivity. In addition, two transformant colonies displayed obvious developmental mutant phenotypes.

Analysis of the Expression of a Maternal Effect Mutation in *Drosophila melanogaster*

Laura Shady
Dr. Janna McLean, Faculty Mentor

We are studying a maternal effect lethal mutation in *Drosophila melanogaster*. The mothers lay eggs that are lacking some protein necessary for normal development. The mutation was caused by an imprecise excision of a P-element which left a 50bp insertion and is shown phenotypically when paired with a chromosome with this

gene deleted. There are two genes that would be affected by this mutation. To determine which is affected, I performed RT-PCR for one of the genes. Both mutant and control ovaries and carcasses were assayed. The transcript of the gene would be in the ovaries if the protein is involved in embryonic development. Southern blot hybridization shows that the gene is expressed in control carcasses and ovaries and in mutant carcasses. We have not yet seen the gene expressed in mutant ovaries. These results support our hypothesis that this gene is the one affected by the mutation.

The Effect of Ethanol on Glutamate Uptake is Time Dependent

Laura Shady
Dr. Susan O. McGuire and Dr. Grace Y. Sun (University of Missouri-Columbia), Faculty Mentor

Astrocytes are star-shaped, nonexcitable cells which make up ~50% of the brain's volume. They provide structural support and nutrient supply to neurons and are capable of modulating neuronal function by altering the synaptic environment. Glutamate is the main excitatory neurotransmitter in the brain. Its action is rapidly attenuated postsynaptically by removal of glutamate from the synaptic cleft by astrocytes. Glutamate uptake is essential to terminate neurotransmission and to prevent extracellular glutamate levels from reaching toxic levels. Since alcoholics show permanent cognitive damage and modulation of neurotransmission, we tested the hypothesis that alcohol depresses glutamate uptake into astrocytes. Immortalized astrocytes were incubated with and without ethanol for 24 and 72 hours. After 72 hours, 50mM ethanol was found to decrease membrane integrity and increase glutamate uptake. Cell protein did not change. The data suggest that glutamate uptake by astrocytes was significantly increased by exposure to physiologically relevant levels of ethanol.

Small-scale genetic diversity in *Trillium cuneatum*

Matthew Shivelbine
Dr. Stephanie Foré, Faculty Mentor

This study examined the distribution of genetic diversity and reproductive mode in a forest population of *Trillium cuneatum*, a wildflower known to reproduce clonally. Five patches of *T. cuneatum* growing in a bottomland hardwood forest on the Savannah River Site, South Carolina were sampled. Patches consisted of ten clusters and each cluster contained a central stem and the four nearest stems. Leaf samples were collected from each stem and genetic data were collected with allozyme electrophoresis. Preliminary data of four polymorphic loci suggest that in 28-70% of the clusters sampled all stems had unique genotypes. These data

indicate that in the small clusters, stems result from both clonal and sexual reproduction.

Voltammetric Detection of Lead Leaching in Lead Crystal Glassware: Development of an Undergraduate Laboratory Procedure

Garrett Slaton* and Theresa Eggleston
Dr. Brian Lamp, Faculty Mentor

The leaching of lead from domestic sources has long been studied because of the hazards associated with lead ingestion. Lead slowly leaches from crystal glassware due to the action of solvent molecules such as water. Trace levels of lead, which may be difficult to detect, can still pose a threat to the health of those using the utensils. Standard methods of trace lead analysis used in teaching laboratories are forms of atomic spectroscopy or stripping voltammetry with mercury electrodes. While metals analysis by atomic spectroscopy is a widespread technique in many undergraduate laboratories, stripping voltammetry with mercury electrodes is not because of mercury disposal problems. Voltammetric detection of lead using solid metal electrodes provides the necessary sensitivity but does not pose such problems. Here we present a method for trace lead analysis of real-world and relevant samples by stripping voltammetry at solid metal electrodes.

Could a Planet Have Two Suns?

Daniel Smith
Dr. Michael Ottinger, Faculty Mentor

Recent observations with the Hubble Telescope have shown the existence of planetary systems other than our own solar system. The concept of a planet orbiting twin suns has been a long favorite subject of science fiction authors. I was interested in computationally analyzing the stability of planetary orbits within a binary star system. To accomplish this study, I wrote a computer algorithm to track planetary trajectories under the influence of twin, orbiting stars. Using this code, I have determined the regions of equilibrium and stable orbits. I will present my findings along with a discussion of the feasibility of life, as we know it, existing on planets within these regions.

A Companion to Biology 108: The Diversity Series

Jennifer Smith
Dr. Nancy Sanders, Faculty Mentor

Biology 108 is the second semester course of the two semester introduction to biology for majors at Truman State University. The first eight weeks of laboratories conducted in biology 108 address biodiversity of multicellular organisms. Students observe and are asked to answer many questions regarding live and preserved specimens. Currently there is not a sole source of reference to aid in answering the more difficult and open ended questions. The focus of this project is to author a companion and self paced teaching tool for the Biology 108 Laboratory Manual. Currently the companion is in hard copy state. Ultimately the hope is that this companion manual will be accessible via computer disk or CD-ROM.

The Effect of Seed Weight on Emergence and Seedling Growth in a Variety of Commercial Species

Kristen Sorensen
Dr. Steven Carroll, Faculty Mentor

Variation in commercial seeds has been reduced in comparison to their native ancestors as a result of breeding. However, some variation in seed size and quality still remains. To determine whether remaining variation in seed mass affects seedling emergence and growth, seeds from a number commercial species were weighed and planted. Time required for emergence and weekly height of seedlings were determined over a three to four week period. Preliminary data suggest that variation in seed size is not significantly correlated with time required for emergence or seedling growth rate. However, a tendency toward significance was observed and additional plantings are underway.

Effects of Litter on Post-Burn Grassland Productivity

Amy M. Teachman
Dr. José Herrera, Faculty Mentor

Many pathogens and herbivores cause plants to reallocate energy towards defense. Since many of these pathogens and herbivores reside in litter, I hypothesize that burning the litter decreases the number of pathogens and small herbivores, and so, allows the grasses to allocate more energy towards photosynthesis. In addition, litter removal may increase incident sunlight, increasing soil temperature, and so increasing nitrogen-fixing bacterial populations

that may make nitrogen more available to grass roots. Our results using computer image analysis software and soil dilutions suggested that post-burn grassland growth is primarily caused by increased microbial activity, not an increase in the number of pathogens as measured by number of pathogenic lesions.

Nocturnal foraging behavior of the southern flying squirrel, *Glaucomys volans*

Michael J. Tucker, Jr.
Dr. L. Scott Ellis, Faculty Mentor

Foraging behavior is an important component of the ecology of small mammals, because they must locate food sources and avoid predation. Little is known about foraging of southern flying squirrels, *Glaucomys volans*, due to their nocturnal and arboreal nature. This study represents a test of a method to watch these nocturnal rodents at night using Cyalume glow sticks attached to their bodies. Foraging behavior was quantified by noting at thirty second intervals the location of squirrels in the forest strata. It appears that most foraging occurred from the lower third of the trunk of large canopy trees. These trees provided the elevation necessary to glide to new locations. Problems and limitations of this method of observing nocturnal small mammals are described.

Calcium-dependent Flagellar Dominance in *Chlamydomonas* is Apparently Not Regulated by Phosphorylation

Michael E. Watson, Jr.
Dr. David Howard, Faculty Mentor

The unicellular green alga *Chlamydomonas* possess two flagella which respond differently to changes in intracellular $[Ca^{2+}]$ to coordinate phototactic turning. The exact mechanism by which calcium ions regulate flagellar beating is still unknown. Results from several labs have led us to hypothesize that the phosphorylation state of axonemal dynein modulates the effects of Ca^{2+} to coordinate flagellar dominance and phototaxis. To investigate this hypothesis, cells were demembrated, treated with specific kinase or phosphatase inhibitors, and reactivated with ATP over a range of Ca^{2+} concentrations. Ca^{2+} -induced changes in flagellar dominance were determined by microscopic observation. Neither kinase nor phosphatase inhibitors significantly changed the Ca^{2+} effect on flagellar dominance from that in control cells. Therefore, it appears that the ability to coordinate phototaxis through differential activation of flagella, probably involves a mechanism other than phosphorylation.

Energy Needed for Various Amounts of Time Travel

James White
Dr. Peter Rolnick, Faculty Mentor

If you travel from earth to a faraway star and back, the theory of relativity says that time slows down for you relative to time on earth. In other words, over the course of the trip, you've time traveled into the future. However, for a given period of time as measured on earth there are many ways to make such a trip because you can accelerate in different ways. For instance, you could accelerate gradually during most of the trip or you could instead accelerate quickly and coast at constant speed for most of the trip. Your method of acceleration then determines the amount of energy needed. For a particular trip then, you use energy and experience some amount of time travel. I will examine the relationship between energy expenditure and amount of time travel for a few scenarios of such a trip.

Did Drugs Destroy Descartes?: Shifting Perspectives in 20th-Century American Psychiatry

David F. Widitz
Dr. Philip Wilson, Faculty Mentor

Psychoanalysis developed in the early twentieth century as an attempt to transfer subconscious thought to the realm of the conscious mind. The theoretical underpinning of this practice developed, in part, from the Cartesian belief in the separation of mind and body. However, not all twentieth-century psychiatric techniques so wholeheartedly embraced this philosophy. For example, more recent trends in prescribing drugs for mental illness imply that psychiatry is no longer so entrenched in Cartesian dualism. This project analyzes American psychiatry's shift from an adherence to psychoanalytic mind/body separation toward a practice focused upon biomedical mind/body unity.

Involvement of *Chlamydomonas* inner arm dynein 11 in differential flagellar response to calcium

Greg Williams
Dr. David Howard, Faculty Mentor

Previous research indicates the two flagella of the unicellular green alga *Chlamydomonas* respond differently to calcium in vitro. Calcium has also been implicated in regulating phototaxis, a behavioral response of *Chlamydomonas* that results in the cell swimming towards or away from light. Other research demonstrates that gene-

tic mutants that either lack axonemal inner arm dynein I1 or contain overphosphorylated I1s cannot perform phototaxis. I used the mutants *pf9-3* and *ida3*, which lack I1 dynein, and mutants *mia1* and *mia2*, which contain overphosphorylated I1, to determine if I1 is necessary for a flagellar response to calcium. Cells were lysed with detergent and reactivated with ATP over a range of calcium concentrations. Data was then collected by counting cells displaying distinctive patterns of motility.

Determination of Vitamin A by High Performance Liquid Chromatography

Ryan Wilson
Dr. Yinfa Ma, Faculty Mentor

A nutrition study was done on a group of gerbils to relate the carotenoid concentration in their diet to that of the total Vitamin A levels in their liver. To find the Vitamin A in liver, the samples were ground to a powder with sodium sulfate and then saponified with potassium hydroxide to convert retinol esters to the Vitamin A form. The Vitamin A was extracted out of the samples with hexanes containing butylated hydroxy toluene to prevent oxidation. The extract is evaporated, the residue is dissolved in methanol, and total Vitamin A concentration is determined by high performance liquid chromatography.

Women in Science

Erika Woehlke
Dr. Michael Nelson, Faculty Mentor

Women have played a very important role in the sciences throughout recorded history. However, because of social discrimination they have been forced to struggle for respect in the Academy. Moreover, many scientific contributions by women remain relatively unknown. A chronological examination of this struggle provides evidence that women indeed have contributed to our understanding of scientific principles and have made critical discoveries in the scientific world. These achievements will be illustrated on an interactive web site.

Synthesis and Characterization of (1-ethyl-3-methylimidazolium)₂PdCl₄

Michael J. Wyzlic
Dr. Michael F. Ortwerth, Faculty Mentor

Two methods were used to synthesize (1-ethyl-3-methylimidazolium)₂PdCl₄. The first was a solution reaction using an acidic (60:40) 1-ethyl-3-methylimidazolium chloride/aluminum chloride molten salt as the solvent with Pd(acetylacetonate)₂ as the solute at room temperature in an inert atmosphere glove box. The second was a solid state reaction using PdCl₂ and 1-ethyl-3-methylimidazolium chloride at 190-200°C on a Shlenk line. Both techniques used a dry nitrogen atmosphere. Crystals were obtained by solvating the compound in methanol and keeping the solution at 12 to -15°C until crystals were formed. This compound has been analyzed and characterized by melting point, NMR, IR, and x-ray diffraction. A solid state structure has been determined.

The assessment of genotypic differences between early and late resprouts of *Vaccinium stamineum*

Joshua Vest, David Ernst
Dr. Stephanie Foré, Faculty Mentor

The purpose of this experiment was to determine if there are genotypic differences between the early and late resprouts of the species *Vaccinium stamineum*. *Vaccinium stamineum* is a clonal plant of the fire driven communities of the Carolinas and Georgia. Leaf samples for this study were collected from a site where a fire in the spring of 1997 incinerated all above ground biomass. Samples of both the early and late resprouts were collected from random quadrats within patches. To evaluate the genotypic differences in the early and late sprouts, DNA was extracted from each leaf sample and assessed using randomly amplified polymorphic DNA markers. Data indicate that, in some quadrats, the early and late sprouts are genotypically different and are not replicates of the same clone.

Nondestructive Amylose Determination In Corn by NITS.

Jerry Yoakum* and Jennifer Top
Dr. Mark Campbell, Faculty Mentor

Although breeders of specialty starch hybrids currently screen for many starch properties, a bulk of the effort continues in developing starch with high amylose levels. Applications of high amylose starches include use in candies, biodegradable polymers, barriers in fried food and nutraceuticals. Traditional laboratory techniques for

determining starch-amylose levels are time consuming, which greatly limit the amount of germplasm that can be screened in a breeding program. We are currently investigating the use of Near-infrared Transmittance Spectroscopy (NITS) as a nondestructive and rapid alternative. Previous studies with NITS have indicated good predicative power however improvements are needed with respect to overall precision. In this study we investigated preliminary calibrations based on using different sets of germplasm. Use of calibrations based on multivariate statistical analysis vs. neural networking will also be discussed.

Photoeimerization of 2-Methoxy-1,4-Naphthoquinone

Mike Zahra
Dr. Anne Moody, Faculty Mentor

2-Methoxy-1,4naphthoquinone has been synthesized and exposed to incandescent light to induce an expected dimerization. ¹H NMR spectroscopic investigations imply a 2+2 cycloaddition, similar to related compounds in the literature. Scale-up for further spectroscopic and X-ray crystallographic characterization are in progress. The mechanistic implications of this dimer's stereochemistry will be discussed.

Eugenics and Race in the Tuskegee Syphilis Study

Sarah Zapf
Dr. Philip Wilson, Faculty Mentor

In the 1930s the United States Public Health Department began to study the effects of untreated syphilis in several hundred African-American men in Tuskegee, Alabama. Scientific study of select groups of Americans had also occurred within the eugenics movement of the Progressive Era, during which observations were made about factors that might improve or impair the racial qualities of future generations. This project examines the extent to which eugenics was incorporated as part of the rationale underpinning the Tuskegee Syphilis Study. Research for this undertaking is based upon a review of eugenic manuscript material and secondary literature analyzing the Tuskegee study.

Social Science

Retention Rates at Truman State University

Tracie Lynn Adams
Dr. Candy Young, Faculty Member

The retention of students from the freshman to sophomore year in college is of high concern for universities throughout the country. Retention rates are a reflection of a university's culture and mission and affect a university's academic credibility and funding. This research is based on an interview study of 89 freshman at Truman State University. The study examines the relationship of grade point average, quality of advising, distance from home and entering test scores to retention.

Assessment of Reward, Competence, and Likability as a Function of Prosecutor Characteristics

Paula Aguilar, Kathleen Cook

Dr. Judi Misale, Faculty Mentor

In this replication and extension of a previous study, participants read scenarios describing either an experienced female or male prosecuting attorney's behavior in a first-degree murder trial. In this between-subjects experiment, the prosecutor in the scenario employed either an aggressive or non-aggressive strategy during the trial. Aggressive behaviors included interrupting and being short with the witnesses and objecting to questions and motions presented by the defense. One hundred and five participants subsequently estimated the salary of the prosecutor, and assessed the prosecutor's competence, the effectiveness of the strategy he or she used, the likelihood the prosecutor would be promoted to District Attorney, their personal liking for the protagonist, and their desire to be represented by this attorney. Results showed participants generally favored the aggressive strategy for trial-relevant and promotional issues, but they personally liked the aggressive prosecutor less. Prosecutor gender qualified perceptions of success and liking.

Lottery Receipts and Education Funding: Do Schools Win When You Play?

Carrie Auer

Dr. Terry Olson and Charles Murray, Faculty Mentors

State-run lotteries have become an increasingly popular way for states to generate revenue. It is widely believed that school funding directly (through the earmarking of state lottery receipts) or indirectly increases as money from the games fills state coffers. The purpose of this study is to examine the relationship between lottery receipts and expenditure on education at the elementary and secondary levels for the thirty-six states operating lotteries in 1994, controlling for the number of students per state, the political affiliation of the state's governor, state tax revenue, and whether or not states earmark lottery monies for education. The data suggest that lottery receipts merely substitute for general revenue funds previously targeted for education, as opposed to bolstering existing funding, even if states earmark.

The Influence of "Goodness of School" on Salaries of Economics Faculty in 4 Missouri State Universities

Carrie Auer, Stephanie Saltzman, Beth Siemer

Dr. Jane Sung, Faculty Mentor

Many factors determine the salary of university professors. This study attempts to determine the extent which "goodness of a school" contributes to salary of state university professors, specifically economics faculty. Because of the similarities in size of the Economics departments we chose four Missouri state schools: Truman State University (formerly Northeast Missouri State University), Southeast Missouri State University, Central Missouri State University, and Southwest Missouri State University. The study is a linear regression analysis for Ph.D. professors, which accounts for several other variables included in salary. The variable we examine is the rank of the school, which has a bearing on the perceived "goodness of the school".

The Effect of Alliteration, Imagery, Concreteness, Meaningfulness, and Rating on Brand Name

Recall

Daniel Baack

Dr. Mark Hatala, Faculty Mentor

One of the most important components of brand name marketability is the ability of a consumer to remember it. This study examines the effects of alliteration, imagery, concreteness, meaningfulness, and positive or negative ratings on the participants' ability to remember a brand name. Free and cued recalls were used to measure memory. A linear regression statistical analysis found that imagery, concreteness, and rating affected both free and cued recall and that imagery and concreteness affected rating.

The Effects of Education on Gender Differences in Undergraduate Student Essays

Daniel Baack, Brad Niebling, Joshua Lenon, and Joshua Chewing

Dr. Mark Hatala, Faculty Mentor

Past linguistics research has shown a clear difference in language usage between males and female, but the effect that education level has on this difference has not been thoroughly researched. This study hypothesized that the difference in language usage between male and female written language would be less prevalent in academic writing. To examine this claim, the linguistics features of academic essays written by male and female students were examined. Results show an effect for education level

The Effects of Gender on University Professors' Ratings of Undergraduate Student Essays

Daniel Baack, Kathy Milewski

Dr. Mark Hatala, Faculty Mentor

The idea that there is a difference between male and female writing has been strongly supported by past linguistics and communication research, but the effect that this difference has on evaluation of gender specific writing is still questionable. This study hypothesized that since female writing has been shown to be perceived as more pleasant, polite, and educated, that female writing would be preferred for academic writing. To examine this claim, scores on typed or handwritten essays written by male and female students and rated by university professors were examined. Statistical

analysis of these scores revealed a significant main effect for gender with females scoring higher than males, supporting the hypothesis.

Export-Generated Growth through Devaluation: Peso Panacea or Placebo?

James T. Bang, Primary Author
Amy McDonald and Nathan Minnis, Co-Authors
Dr. Jane Sung, Faculty Mentor/Research Advisor

The present-day vogue for developing nations is to generate income growth through free trade and increased net exports. Many have tried to implement this policy via currency devaluation. Mexico faces similar problems and possibilities. Through the NAFTA trade agreement, Mexico's export market has been opened to the largest consumption market in the world—the U. S. In 1995 Mexican monetary authorities elected to devalue the peso, to remedy a severe balance of payments deficit problem. It appears to have worked, and the Mexican economy is grudgingly recovering from deep monetary crisis. The object of this research is to determine if peso devaluations do indeed significantly affect the Mexican trade balance.

End-Tidal CO₂ is the Best Indicator of Breathing Effort

Shawn Bergman, Joseph Dougherty
Fred Shaffer, Ph.D., Faculty Mentor

This study evaluated six indicators of breathing effort during low and high breathing effort conditions. Fifty undergraduates were taught diaphragmatic breathing and randomly assigned to either: low effort, rest, high effort; or high effort, rest, low effort. Each condition lasted 3 minutes. A one-tailed *t*-test showed that ETCO₂ decreased 14%, accessory sEMG increased 39%, frontales sEMG increased 120%, SCL increased 13%, and heart rate increased 4% from low to high breathing effort conditions. Blood volume pulse did not change. ETCO₂ was the best overall effort indicator, followed by accessory sEMG. Clinicians should use both indicators to warn of excessive breathing effort.

Breathing Effort Depresses End-Tidal CO₂

Shawn Bergman, Linda Gannon
Fred Shaffer, Ph.D., Faculty Mentor

This study examined the effects of low and high breathing effort on respiration to test Peper and Holt's thesis that diaphragmatic breathing should be effortless. Fifty undergraduates were taught diaphragmatic breathing and randomly assigned to either: low

effort, rest, high effort; or high effort, rest, low effort. Each condition lasted 3 minutes. A one-tailed *t*-test showed that ETCO₂ decreased 14% ($t[49] = 9.10, p < .0001$) and ETCO₂ variability increased 74% ($t[49] = -5.38, p < .0001$) from low to high breathing effort conditions. These results replicated our previous findings and confirmed the importance of effortlessness and ETCO₂ monitoring during diaphragmatic training.

Description of the Truman Breathing Assessment Protocol

Shawn Bergman, Matt Henson
Fred Shaffer, Ph.D., Faculty Mentor

This study standardized a 25-minute breathing assessment protocol on 45 undergraduates. The profile measured abdominal excursion, abdominal strain gauge tension, accessory sEMG, ETCO₂, inhalation volume, peak flow, respiration rate, and SpO₂. Participants were screened for reverse breathing. Peak flow and inhalation volume were then measured. Participants were examined during 3-minute serial-7s and visualization stressors, each followed by a 3-minute recovery period. Finally, a 3-minute spirometer challenge evaluated accessory muscle overuse. A representative data record was examined to show how this protocol could help identify dysfunctional breathing behaviors and develop quantifiable training goals.

Subjective indicators Warn Against Excessive Breathing Effort

Shawn Bergman, Brian Yochim
Fred Shaffer, Ph.D., Faculty Mentor

This study evaluated three subjective indicators of breathing effort. Forty undergraduates were taught diaphragmatic breathing and randomly assigned to either: low effort, rest, high effort; or high effort, rest, low effort. Each condition lasted 3 minutes. Regression analysis showed that ratings of accessory muscle use and breathing loudness predicted 25% of the variance in ETCO₂ in the high breathing effort condition ($F[2, 37] = 7.65, p = .0017$). Ratings of abdominal excursion force were unrelated to ETCO₂. Patients should use self-monitoring of accessory muscle use and breathing loudness to warn against excessive breathing effort.

“From the Heart of All Fathers”: Saint Augustine and His Son

Christopher R. Brink
Dr. Thomas Zoumaras, Faculty Mentor

Though there have been literally hundreds of monographs written on Saint Augustine and his impact upon philosophy, religion, literature and political thought, there has been little interest in one of Augustine’s most intimate personal relationships, his relationship with his son, Adeodatus. A careful examination of Augustine’s writings in regard to his son, *The Confessions*, *On the Teacher*, and *On the Happy Life*, demonstrates that while the birth and death his son had a great impact upon Augustine, they did not affect him nearly as profoundly as one might have expected. A wide variety of secondary sources were used in concert with the primary sources, both as a basis for interpretation and as support for my own arguments.

The United Methodist Church: Pretending Equality?

Kimberly Bechtel
Dr. Paul Parker, Faculty Mentor

The unequal roles of women in Catholicism and Islam are well-documented. Less understood is the unequal position of women in the perhaps nominally equal United Methodist Church. Though women have been ordained for many years in the church, there are indications that women are disadvantaged in UMC ministry careers. Church documents have shown a high number of sexual harassment reports, considerable differences in the characteristics of female and male clergy, and a high rate of attrition for females.

The project utilizes available church documents, secondary studies, and personal interviews to present discrepancies between the genders and analyze two competing theories which seek to explain the inequalities—organizational structure and individual self-selection. This study explores both the organizational structure and the characteristics of ministers to attempt to determine which of these theories is supported by the data.

Bosnia and the Defense of Susan Sontag

Heather Burgess
Dr. Keith Doubt, Faculty Mentor

Susan Sontag, author, most recently, of the novel *The Volcano Lovers*, made several trips to Sarajevo in the early 1990s in the midst of a war to which much of the world responded with indifference.

Sontag claimed that she, and indeed all who considered themselves intellectuals, had a moral obligation to encourage intervention in the war in Bosnia. Her critics, most of whom opposed intervention by the United States or other countries, claimed that she was exploiting the victims of the war for publicity and personal gain. This presentation will address both Sontag and her critics’ perspectives in order to construct a meaningful account of Sontag’s trips to Sarajevo and develop a sociological understanding of her actions.

A Preliminary Study of the Effects of Colonization in Bolivia’s Amazon

Brian C. Campbell
Dr. Michael Davis, Faculty Mentor

The Amazon region of Bolivia has experienced a significant influx of emigrants during the 20th century, most of them from the Andean sector of western Bolivia. The Bolivian government promoted the “colonization” for a variety of stated reasons, ranging from the alleviation of demographic pressure in the urban highlands to the integration of remote national territory. Because the majority migrated from the highlands, they were unfamiliar with the environmental conditions and appropriate agricultural methods of the Amazon. The immediate consequence was the destruction of surrounding areas in order to create a more familiar atmosphere, which generated repercussions of its own. Besides the environmental effects of the colonization, the introduction of foreign ethnic groups with a much longer history of Spanish contact created a previously unexperienced social situation. Field research was conducted in the summer of 1997 in the colony of San Julian in the Bolivian Amazon.

Racism and Negative Stereotyping of Minorities in Advertising

Patrick Cross
Dr. Keith Doubt, Faculty Mentor

In the United States, minorities have made significant political and economical advancements over the last twenty years. Research has shown that the commercial marketing of minorities now exceeds 500 billion dollars a year. The problem that continues to exist is the use of negative ethnic stereotyping in advertising. In conjunction with other presentations in this mini-series, racism and negative stereotyping in American society will be highlighted and examined. Three common stereotypes often found include: if you are black, then you are an athlete; the majority of black teenage females get pregnant; and blacks are like animals that need to be in cages. Today, minorities want advertisers to use portraits of healthy, positive individuals in integrated setting with an upscale lifestyle. Some sociologists feel this can be achieved through the use of ethnic

specialists, surveys, focus groups, and tailored advertising approaches.

Race Matters in Advertising

Nikita Noel Dixon
Dr. Keith Doubt, Faculty Mentor

Marketers regularly attempt to sell products through both implicit and explicit use of race in advertisements. In analyzing this topic, a common cosmetics advertisement was chosen. The relationship between choice of model and environment was thoroughly examined. The apparent significance of skin color in society was investigated as well. This idea is supported by information from Cornel West's *Race Matters* and feminist essays included in Macionis and Benokraitis' *Seeing Ourselves*. Comments made by minority women in the video *Skin Deep* serve to supplement the argument. In addition, perspectives on effective ways of representing target audiences are explored.

Transplanting the Tradition: The Development of Yoga in America

Mark Dodds
Dr. Mike Ashcraft, Faculty Mentor

The growing trend towards globalization is creating an inevitable gray area between cultures. Through this area of melded cultures, societies (America in particular), are able to appropriate other cultural systems without full understanding of the traditions roots and presuppositions. In this study, I explore how Yoga was introduced to America, focusing on the influences of Swami Vivekananda and the comparisons made between Yoga and Western science. I discuss how yogis of the twentieth century have since made appeals to Western science for validation of their techniques, and I examine how the spiritual aspects of Yoga can be stripped from the tradition because of the nature of the relationship between science and Yoga. Furthermore, to enrich the study of Yoga, I have created two new classifications. Both "Contemporary Yoga" and "Secularized Yoga" are products of a dynamic tradition that is once again changing in light of novel interpretations and challenges.

Visual Attention Guidance

Joseph D. Dougherty and Philip M. Jorn
Dr. Terry Palmer, Faculty Mentor

Research suggests that observers can unconsciously learn to guide eye movements based on complex sequential patterns that contain information concerning a target's upcoming location. The present

study tested whether visual attention can be guided in a similar manner. Though participants were able to recognize elements of a preceding seven element sequence of shapes and colors, reaction time and error rate measures for the target identification task indicated that they were not using this information to guide attention. This result challenges recent theories suggesting an interdependence between attention and eye movements.

A Comparative Case Study of Grameen Bank and World Bank Development Programs in Bangladesh: Theory, Evidence, and Limitations

Lisa Eaton
Dr. Marijke Breuning, Faculty Mentor

The challenge of poverty in South Asia is quite serious. The region contains about one-fifth of the total population of the world, of which about forty percent is below the poverty line. The purpose of this study is to find a possible answer to the running debate on poverty alleviation: What type of development assistance is most successful in alleviating poverty in developing countries? Developmental success is defined in accordance with Qizilbash's (1996) list of prudential values. Microloans given to the rural poor in Bangladesh by the Grameen Bank and the more traditional multilateral aid given to Bangladesh by the World Bank were analyzed to determine the benefits and types of development these two contrasting forms of assistance exemplify. The study revealed that as a nongovernmental organization, the Grameen Bank is in a unique position to contribute to equitable growth and development in Bangladesh.

Navajo-Hopi Rehabilitation Act (1950)

Jerritt Farrar
Dr. Candy Young, Faculty Mentor

The Navajo and Hopi Reservations were created by a treaty with the federal government in 1868. They encompassed over 25,000 acres of land in Arizona, New Mexico, and Utah. Over the years the living conditions of the two tribes had steadily decreased. Erosion and overgrazing had stripped their land of its usefulness. Likewise, the government had not provided the schools and roads that it had promised in the original treaty. This paper will explore the push in the mid-to-late 1940s for a long range rehabilitation bill to appropriate \$88,750,000 for improvements on the reservations. It will also survey the conflict that took place between the various groups supporting the legislation and their vision of how it ultimately should look. Finally, it will look particularly at the impact of this bill in the area of education on the reservations.

Racism in Advertising

Emily Fiftal

Dr. Keith Doubt, Faculty Mentor

Through a focused examination of a Halston clothing line advertisement featured in the September 1997 issue of *Glamour* magazine, the researcher demonstrates the continued presence of racism in advertising. Analysis of the non-verbal messages of the ad, such as clothing, posture, and eye contact, shows how white interests and standards of beauty are preserved in the advertising industry while ethnic minorities are presented in a lesser position. References are made to the research of sociologists Jean Kilbourne, Cornel West, and Marty Westerman

Personalities of Male and Female Leaders

Linda Gannon*

Dr. Teresa Heckert, Faculty Mentor

The leadership motive profile (-LMP) as described by McClelland (1975) defines a successful leader as possessing a high need for power, a strong ability to control the impulse to express power, and a high need for affiliation. A low need for achievement has also been included as a successful leadership characteristic. However, in creating the leadership motive profile, researchers used only males. Cornelius and Lane (1984) found evidence that the LMP may operate differently in females than in males. This study investigated the application of the LMP to female leaders. Type A personality was also measured for possible sex differences. College student leaders (36 males and 66 females) completed measures of social motives, action inhibition, and Type A personality. Females scored significantly higher on Type A personality than males. There were no significant sex differences in the needs for power, achievement, affiliation, or impulse control.

Relations Among Faculty Age and Various Student Behaviors Toward Them

Linda Gannon*, Sandra Schneider*, Kayla White, and Rebecca Schnarre

Dr. Teresa Heckert, Faculty Mentor

This study focused on the possibility of age of faculty affecting student behavior toward them, an area in which little research has been done. Of the 305 surveys distributed to instructors at Truman State University, 204 were returned. Of the participants, 39% were female, 90% were Caucasian, and 75% had completed a doctoral degree. Age was significantly related to frequency with which advisees visited the professor's office, called them at home, joked with them, addressed them as doctor when first meeting them,

shared sexual habits with them, and displayed inappropriate sexual behaviors toward them. The nature of these relationships will be discussed.

What at Predicts Political Support at the Local Level?: A Case Study of Quincy, Ill.

Kent Haroz

Dr. John Ishiyama, Faculty Mentor

The factors that affect support of local officials are often neglected. Most leadership support studies examine support at the national level. They conclude that partisanship identification is a better determinant of voting habits than issue-driven models. The few studies at the local level, however, contend that positions on issues weigh more heavily for voters than a candidate's partisan affiliation. This study will seek to examine the relationship between leadership support, partisanship, and issues at the local level. To that end, a public opinion telephone poll was taken in Quincy, Ill., during December 1997, involving 307 participants. That poll assessed people's positions about local issues candidates, and partisan and issue congruence between local leaders and voters. The study demonstrates that partisanship plays little role in voter assessment of local political leaders.

Druidic Resistance to Romanization in Gaul

Dustin Havens

Dr. Martha Edwards, Faculty Mentor

This paper will examine the role of Druids in opposing Roman rule in Gaul. The territorial expansion of ancient Rome brought it into contact with many foreign cultures. This expansion generally began with a military conquest and was followed by a process of settlement and Romanization. With the contact between Roman civilization and native society came many problems. The political institutions, economic infrastructures, and cultural ideas of the conquered peoples were dealt with by Rome each in their own way. As to the religion of the native inhabitants, Rome was generally tolerant. In Celtic Gaul the Druids administered the religion. At their peak of power just prior to the arrival of Romans in Gaul, the Druids held very high status in society and garnered much political power. They were judges, educators, priests, and political advisors, therefore they had the most to lose from an incursion from a foreign power. The Druids played a part in the revolts, which resisted Roman domination.

Demographic Characteristics and Moral Development

Philip Jorn
Dr. Terry Palmer, Faculty Mentor

The moral attitudes of college students raised in small rural vs. urban communities were examined. 70 students from Truman State University participated in the study. Moral attributes were assessed using a 19-item scale, consisting of two parts- a set of multiple choice questions and a set of open-ended questions. For the multiple choice scale, the size of the town in which an individual was raised was positively correlated with moral attitude ($r = 0.36, p = .05$). In general, individuals from small towns held a more conservative attitude while individuals from large towns held a more liberal attitude. Interestingly, for the open-ended scale, this same correlation did not reach significance. Results suggest that, in interpreting the categories in the multiple choice assessment, subjects were using mental prototypes as a reference point.

Genocidal Rape in Bosnia-Herzegovina

Anne Lacey
Dr. Keith Doubt, Faculty Mentor

In the early 1990s war broke out between the three major ethnic groups of Yugoslavia (Orthodox Serbians, Catholic Croats, and Bosnian Muslims). Serbians, as the main aggressors, pursued a genocidal agenda, obscured by the title of "ethnic cleansing." Soon after the Serbians entered Bosnia-Herzegovina reports of mass rapes surfaced. The number of reported rapes is now approaching 50,000. This study analyzes the role rape played in the Serbian's policy of genocide, the different ways rape was used, and personal accounts of victims.

The Relevance of Stereotyped Occupations and Gender to Estimates of Wage and Competence

Jamie Morgan
Dr. Judi Misale, Faculty Mentor

In this between-subjects replication and extension of a previous study, male and female participants read scenarios describing the work activities and personal characteristics of either a nurse specialist (a female sex-typed occupation) or a systems analyst (a male sex-typed occupation), jobs with equivalent real-world market value. Further, participants read the person employed in the position was either a female or a male. One hundred forty-nine male and female participants subsequently estimated both fair and actual

annual incomes for the described position, their own likelihood of accepting this job, their expected salary in such a contingency, and how competent they felt they would be in that position. Results indicated participants devalued the female employee in both occupations, but they were likely to take, and felt more confident about, the female sex-typed position. Participants' gender further qualified these findings.

The Effects of Gender And Performance on Estimates of Control and Attributions for Performance

Jamie Morgan and Kathleen Cook
Dr. Judi Misale, Faculty Mentor

When people experience loss of control, such as a failure situation, they often ask "why" questions, because they want to understand and to regain control. Research demonstrates differing attributions for success, depending on the target person's gender. Attributions of ability follow success by males, while success by females elicits attributions to luck or hard work. Participants in this study read a scenario in which either a male or female target won or lost at Trivial Pursuit. Participants then answered questions assessing how successful the target was, how much control the target had, the target's mood, and the attributional sources of success or failure. Results showed participants indicated a significant loss of control with failure, but more so when the female target lost. Likewise, the female target was rated as less successful when she lost than the male target when he lost. Outcome and gender qualified other effects, and demonstrated results contrary to previous research.

Alexander and the Amazons

Mark Munson
Martha Edwards, Faculty Mentor

Throughout the course of history scholars have debated the existence of the group of women warriors known as the Amazons without reaching a definite conclusion. Embedded in this debate is the question of where these alleged women lived. The ancient sources available each have their own opinions about where these women lived and about their possible encounter with Alexander the Great. Gender relations and biases in the ancient world play a major part in this argument. The key to defining the potential existence of the Amazon warriors lies in their depictions in literature and sculpture.

The Lost Sepulcher: A Study of the Burial and Tomb of Alexander the Great

Mike Murawski

Dr. Martha Edwards, Faculty Mentor

One of the mysteries remaining about Alexander the Great surrounds his burial and tomb. Ancient Greek and Roman sources have written several contradicting accounts of Alexander's burial and the location of his tomb. The nineteenth-century scholar Edward Carke also presents a significant amount of information on the possible site of Alexander's tomb, hypothesizing its existence in Alexandria, Egypt. Several recent archaeological projects in Egypt also claim to have found evidence of Alexander's tomb, particularly at Siwa and Alexandria, Egypt. After reviewing the reliability of the ancient sources and modern archaeological work, correlations will be made as to how Alexander may have been buried. Information about Macedonian and Egyptian burial customs during Alexander's time period will be examined including the Macedonian royal tombs at Vergina and Ptolemaic burials in Egypt. This information, when collated with earlier accounts, indicates that mainly Macedonian and Egyptian burial customs were employed to place Alexander the Great in his final resting place.

Alexander's Manipulation of Mythology

Beth A. Nelson

Dr. Martha Edwards, Faculty Mentor

Alexander the Great inspired his army to go farther in the pursuit of impossible dreams than any other man in history. Alexander's leadership skills over his troops accomplished a great empire, and necessitated the creation of a god-like persona to lead his invincible army. Alexander used court historians to create a persona that mirrored the life of the great Greek heroes, from Homer and beyond, and these stories survived in the writings of Plutarch, Arrian, and Curtius Rufus. Comparing these accounts of Alexander's life to the guidelines of David Adams Leeming and Joseph Campbell, concerning the journal of the hero and his life, it can be shown that the historical accounts of Alexander follow these guidelines and create a persona worthy of inspiring men to great feats. These histories of Alexander's life were designed to prove his right to conquer the world.

Evaluating the Effectiveness of Stress Management Techniques Among College Students

Bradley Niebling* and Shannon Ross

Dr. Teresa Heckert, Faculty Mentor

The effectiveness of a stress management workshop for college students was investigated in relation to level in school, Type A personality, and whether students lived on campus. The participants for the study were 53 undergraduate students (93% Caucasian, 90% female, 80% lived on campus, and 43% first year students) at Truman State University in Fall 1997. Participants completed a Student Life Inventory and a Type A scale. The experimental group participated in a typical stress management workshop, consisting of time management, nutrition and exercise, assertiveness training, cognitive restructuring, and relaxation training. The content of the workshop was based on a needs assessment survey given to 100 other students in Spring 1997. The control group participated in passive stress management, specifically they watched a movie. Preliminary findings suggest that participants in both groups found the experience beneficial in reducing stress. Additional analysis are being done currently.

Theoretical and Empirical Analysis of Parent-Child Interactions

Carrie Plocher, Kelli Williams, and Samantha Wilson

Dr. David Conner, Faculty Mentor

Beginning with Bandura's theory of social learning and Vygotsky's theory of cognitive development, the goal of this multi-year project is to test specific theories of parent-child interaction (i.e., scaffolding and distancing theories). Parent and child pairs were used as participants in the study where mothers and children rated four videotaped interactions each illustrating a different level of responsiveness to the child. Participants were also videotaped in free play and structured tasks which are presently being scored using Sigel's distancing strategies. The distancing strategies and results of the current phase of data analysis will be discussed during the presentation.

Words of Power: A Rhetorical Examination of Four Black Nationalists Movements

Robert N. Ralston
Dr. John Quinn, Faculty Mentor

Although the existing literature in political science has produced important work on nationalism in other countries, it has all but ignored the development of Black Nationalism in the 20th century. There have been some studies which have described individual leaders of Black Nationalist movements but rarely do these adopt a comparative perspective. This paper proposes to employ existing theoretical literature and extend it to the study of Black Nationalism. Using Simons' (1970) work on the rhetoric of social movements, this paper content analyzes the programs and leadership speeches of four twentieth century Black Nationalist movements: The Nation of Islam, the Moorish Christian Science Temple, the Nations of Gods and Earths, and the Black Panther Party. Using computer assisted word and theme codings, this paper establishes differences between "radical" and "moderate" rhetorical strategies and tests the effects of several factors which might explain the degree of radicalism of Black Nationalist movements.

The Effect of Height on Female Dating Preferences

Amy Ringwald and Jamie Schmersahl
Dr. Michele Y. Breault, Faculty Mentor

This study examines the role that differences in male height have on female evaluations of dates. Although older research supports the male taller norm which states that females prefer to date males who are taller than themselves, there is little recent data to support this. Female subjects were classified as short (5'3" or under), average (5'4"-5'7"), or tall (5'8" or taller). They evaluated several potential dates on a 6-point willingness to date scale. The three target dates were described as four inches taller, as the same height, and as four inches shorter than the female. The order of presentation was varied to control for order effect. Results indicated a significant main effect of target height. Subjects rated shorter males as less desirable than same size or taller males which supports our hypothesis.

Personality Similarity and Interpersonal Conflict among College Roommates

Lisa Roberts*, Michael Mueller, Matt Jones, and Shawn Bergman*
Dr. Teresa Heckert, Faculty Mentor

Interpersonal conflict among college roommates can have serious effects on academic and social life (Pace, 1970) and psychological well-being (Lepore, 1972). The purpose of this study was to extend prior research on personality similarity and compatibility. Participants were 104 undergraduate roommate pairs. They were asked questions assessing personality, morningness, conflict, and liking. Results indicated that neuroticism similarity was significantly related to frequency of conflict ($r=.21$) and need for achievement similarity was significantly related to variety of conflict ($r=.25$). Similarity in conscientiousness and the need for autonomy were significantly related to liking ($r=-.39$ and $r=-.33$, respectively). Very limited support was found for the prediction that personality similarity would be related to conflict and liking. Overall, it would appear that certain personality traits may be more important than others in predicting conflict and liking among roommates.

Disability and the Emmett Till Lynching: Media Portrayal of the Disabled

Michael Roth
Dr. Jerrold Hirsch, Faculty Mentor

Many historians place the beginnings of the modern civil rights movement with the lynching of Emmett Till in 1955 Mississippi. Although this case has garnered much attention for its role in race relations, its ties to the field of disability history have been overlooked. Till had a speech impediment and also had a bout with polio as a child. These "afflictions" were reported in passing in both major and local newspapers, newsmagazines and histories of the civil rights movement, and reveal attitudes to disability as well as race. This paper will focus on Till's race and disability and their relationship in the media of the era. By viewing Till's portrayal, much can be learned about 1950's cultural views of race and disability.

An Investigation into New Diagnostic Tools for Children with ADHD

Chris Smith, Heather Droste, Michelle Pattavina, Sarah Miller, Jed Carleton
Dr. Robert Tigner, Faculty Mentor

Few reliable and valid tests for Attention Deficit Hyperactivity Disorder (ADHD) currently exist. The present research involves merging the attention research of cognitive psychologists with the work of clinical psychologists who diagnose ADHD. Two attention tasks, the negative priming task and the change paradigm, were both given to a sample of college students. The negative priming task offers a measure of a person's attentional inhibition, while the change paradigm is commonly used to measure behavioral inhibition. The combination of the two tasks reveals an attentional profile for each participant. Results from the first phase of this research will be presented. The second phase of the research will involve presenting these same tasks to groups of children with and without the ADHD diagnosis. It is hoped that an attention-deficit profile will be revealed that can then be used to better diagnose this disorder.

Prostitution in Classical Athens

Emily Steffans
Dr. Martha Edwards, Faculty Mentor

The institution of prostitution in Classical Athens provides a window into Classical Athenian society. This institution reflects the economic, social and political aspects of society. My research focuses on female prostitution beginning with Solon in the Archaic Age; centering on his political actions that helped to make prostitution an economically viable institution. It then discusses the four groups of female prostitutes in Classical Athens: concubines, *dicterides*, *auletrides* and the *hetairae*. Finally, the representation of prostitution in art in Classical Athens will be discussed, as artistic representation of prostitution is our main source of information.

Dispelling the Notions of Macedonian Barbarianism: An Examination of the Education of Alexander, Aristotle, and Athens

Heather Tylock
Dr. Martha Edwards, Mentor

Demosthenes, an Athenian statesman often enjoyed referring to Philip, Alexander's father, as a "barbarian." And it was not uncommon for the Greek city-states to refer to their Macedonian neighbors as "backward tribal states unworthy of the Greek name."

There is even a remark made by Aristotle, Alexander's tutor, in which he regards a monarchy as "a mark of people too stupid to govern themselves." Comments such as these have made it the tendency to present the Macedonians in a less than cultural light. Giving us the illusion of a society backwards in its mindset and policy. This backward image of Macedonia and its northern tribes can be dispelled with an examination of its educational customs. Thus essential is an examination of the political atmosphere, Athenian and Macedonian education, the private education of Alexander, and the role of Aristotle with respect to the entire issue.

Luce Irigaray and the Subject of Schizophrenic Language

Aaron Vacin
Keith Doubt, Faculty Mentor

Keith Doubt and I are interested in studying Luce Irigaray's writing on psychotic language and examining how Irigaray, as a postmodern feminist, theorizes the subject. To do so we are studying articles from 1966 to 1969 that are contained in the book "N'est Jarnais Neutre". These works have remained for the most part untranslated and unstudied. Scholars instead focus exclusively on her later and better known work on feminism and gender. In studying these earlier works we hope to accomplish a few things. First, we want to understand how Irigaray tackles and formulates the subject of schizophrenic language. Secondly, we want to compare her formulations to other formulations in the field. Comparing closely against Lev Vygotsky and M. M. Bakhtin's work. And lastly, but less importantly at this time, we want to see how it helps form her later work on feminism and gender.

Courtship in Twentieth Century America

Maureen Welch
Dr. Vanessa Davis, Dr. Jerry Hirsh, Faculty Mentors

At one point or another in nearly everyone's life, men and women go through the process called courtship. This process of wooing and impressing to either get the attention of the opposite sex, or to engage in the first steps of a relationship, have taken some drastic turns throughout the twentieth century. At the turn of the century, men and women had very specific roles, separate jobs, and strict rules to adhere to. However, as the next century, and indeed the next millennium approaches, these rules have changed, and in some cases disappeared. Through ethnographic observation of a local cultural scene and historical research, this project traces these changes in attitudes and customs, as well as the reaction from older generations.

The Cartel Party System and Two Party Democracies

Bryan Westhoff
Dr. John Ishiyama, Faculty Mentor

In 1995 two political scientists, Richard Katz and Peter Mair, introduced what they believed to be the next political party system, to replace the “catchall” parties, in multiparty democracies. In their Cartel party system, the parties utilized the resources of the state and held controlled and managed elections. Rather than compete, they colluded with the other parties to limit the voters to a fixed number of choices and assure themselves a continued place in the government. Katz and Mair however did not devise a means by which to measure the crucial dependent variable; “cartelization”. The researcher has devised a way to test for cartelization and hypothesized that, not only does a cartel party system exist in multiparty democracies with a history of interparty collusion, as Katz and Mair suggested, but also exists in the two party democracies which have no need for interparty collusion.

The Philosophical Writings of Augustine

The Mechanical Mind: Augustine, Artificial Intelligence, and Androids

James Bopp
Dr. Patricia Burton, Faculty Mentor

In Augustinian thought, to have a mind is to possess memory, reason, and will. Recent developments in computer science and neuroscience suggest that there is a possibility that these three attributes can be mechanized and therefore it is possible that mechanical minds will come into existence. Will humans give way to machines, or is there something inherent in human nature that makes it unique from anything that ever has or ever will be created? We are fortunate that Augustine has developed an open theological system that will allow us to discuss such an occurrence within the appropriate context. Augustine’s work regarding memory, reason, and will may allow us to better define what it is to be human in light of non-human intelligence.

Destined to Fall: Satan’s Role in the Writings of St. Augustine of Hippo

Kevin Martin
Dr. Patricia Burton, Faculty Mentor

The character of Satan plays a significant part in the development of any sort of Christian tradition. The more common Medieval theories on Satan’s physical/spiritual form, purpose in God’s Creation, and tactics for attacking Christians are perhaps most clearly defined and explained in the writings of St. Augustine. Specifically, St. Augustine expounds upon Satan’s signature perversion of the Truth by making evil appear to be good and desirable in the Christian life. This causes individuals to believe themselves to be in the right while they commit sin. In looking at this topic, it will be as necessary to investigate why Satan is allowed to do this in God’s Creation as it will be to understand Augustine’s views of how the corruption actually occurs. A brief look at Satan’s form will round out Augustine’s character sketch.

Prudent Love of Mothers: Monica and the Church

Sarah Ledgerwood
Dr. Patricia Burton, Faculty Mentor

In the *Confessions*, St. Augustine stresses that we cannot blindly devote ourselves and our spiritual development to anything temporal. My paper is a philosophical journey aimed at understanding how we can and should love our mother, love the Church, or love any other temporal entity. St. Augustine explores the character of Monica, his own mother, as a symbol of the visible church, and in this way underscores a recognition of the fallibility, the persistence, and the unconditional outpouring of nurturing care common to both of these temporal mothers. St. Augustine uses the example Monica to teach us the limitations of any temporal creature but also to teach us the importance of loving the eternal through our love for flawed temporal creatures and institutions.

Excelsior!: Saint Augustine and Ordinate Self Love

Christopher R. Brink
Dr. Patricia Burton, Faculty Mentor

Saint Augustine is commonly regarded as one of the most acerbic and pessimistic Fathers of the Church, and understandably so if only his Confessions are taken into consideration. This common misconception can be dispelled, however, when one considers Augustine’s writings on the necessity of love (*caritas*). After careful consid-

eration and analysis of *On Christian Doctrine* and the “Homilies on the First Epistle of John,” the primacy of the love of men for God is firmly established, as is the importance of the love of man for his neighbor. The most exciting discovery, however, is the significance Augustine attributes to ordinate self love and its importance in confirming and utilizing the other two.

Give Me Freedom or Give Me Death: Augustine ‘s Anti-Pelagian Writings.

Christopher J. Palo-Graduating Senior, Classics Major
Dr. Patricia Burton, Faculty Mentor

In the year A.D. 409, a certain monk, by the name of Pelagius, came to Carthage in North Africa, fleeing the invading Goths under Alaric. Along with his arrival came his teachings that man had the capability to fulfill all of the commands God had placed on him since the beginning of time. To Pelagius, man’s free will was sufficient to lead a life of piety and that no outside help, i.e. grace, was needed to fulfill that task. Such a belief was not simply heretical to the Christians, but was fundamentally anti-Christian, since such a belief claims that man does not need God and hence Christ’s crucifixion was in vain. St. Augustine, bishop of Hippo Regius, was one of many who were abhorred at such a doctrine. Augustine would spend the rest of his life to actively write against this heresy and to reaffirm the Orthodox Christian position, that man cannot live rightly by himself and needs the grace of God acting on his free will in order to do so. The literature that Augustine produced to state the Church’s position is immense. Some of the more frequently examined works of this sort are *On the Grace of Christ*, *On Forgiveness of Sins and Baptism*, *On the Spirit and the Letter*, *On the Predestination of the Saints*, *On Rebuke and Grace*, all of which are strictly anti-Pelagian writings. Other works from which these inferences can be drawn are *Retractions*, *Confessions*, *On Free Choice of the Will*, *Questions for Simplicianus*, *On Christian Doctrine* and *On Admonition and Grace*. The Pelagian heresy was condemned in 431, one year after Augustine’s death, but the debate of how free man is in determining his salvation, is still relevant to this day.

The Uti and the Frui

Alexandra Glynias
Dr. Patricia Burton, Faculty Mentor

In Augustine’s text *On Christian Doctrine*, he identifies three categories of “things” Christians need for attaining salvation: things to be 1) enjoyed, 2) used, and 3) both enjoyed and used (1.iii.3). Augustine discusses these first two categories, but leaves category three undefined. Thus, understanding the first two categories will render the third clearer.

Augustine explains that the first category includes that which makes us blessed (e.g. the Trinity) and that the second category includes that which sustains us in the quest for blessedness (e.g. free will) (1.iii.3, 1. iv.4). Having identified these two categories, one can speculate about category three. I offer Holy Scripture as a candidate for this third category because it can be used for sustenance and guidance while having its own blessed intrinsic value. Hence Scripture could be both used and enjoyed and the identity of the third category is rendered clearer for the Christian’s spiritual quest.

Because I Said So: Present Day Metaphors and Augustine’s Method of Interpreting the Bible

Adam Potthast
Dr. Patricia Burton, Faculty Mentor

My research into Augustine culminated in this paper which investigates Augustine’s method of reading and interpreting the Bible. Augustine believes in a somewhat systematic method of interpretation of the Bible which preserves the notions of “truth of faith” and “virtuous behavior.” In this paper, I investigate whether such a method is still applicable in modern times. Whereas in Augustine’s time, a metaphor could be interpreted as representing one of a set number of things, present day semiotics have expanded to allow a potentially boundless number of interpretations. Umberto Eco’s *Limits of Interpretation* challenges this idea by submitting new standards for interpretations of texts. Eco’s consideration still puts considerable strain on Augustine’s method of interpretation, though, because of the much larger field of representation. In the end, Augustine’s method is saved by its rationale—the stress on “truth of faith” and “virtuous behavior” which allows us to work in this new system of metaphor while maintaining a correct interpretation.