

UG1

THE ACUTE EFFECTS OF STATIC STRETCHING ON ANAEROBIC PERFORMANCE DURING THE WINGATE ANAEROBIC TEST

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BACKGROUND: Several research articles conclude that acute bouts of static stretching may negatively impact an athlete's performance during anaerobic events. Any generalization of when to perform a static stretching protocol still remains unclear, possibly due in part to the mode of activity being performed. The purpose of this study was to investigate the acute effects of static stretching on anaerobic performance during the Wingate Anaerobic Test. The Wingate test is a 30-second cycle ergometer test that effectively measures a participant's relative peak power, mean power, and fatigue index. **METHODS:** Male MTSU club rugby players participated in this study. Each participant performed the Wingate test twice. One testing session involved a control warm-up (5-minute submaximal cycling) immediately followed by the Wingate test. For the other testing session, the subjects performed 5 minutes of submaximal cycling followed by 10 minutes of lower body static stretching and then the Wingate test. **RESULTS:** During this poster presentation, the relationship between acute static stretching and measurements for relative peak power, mean power, and fatigue index are reported.

UG2

NEANDERTAL MORTUARY PRACTICES FROM SHANIDAR CAVE

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One of the most famous examples of Neandertal (*Homo neanderthalensis*) mortuary practices comes from Shanidar Cave, in the Zagros Mountains of Iraq. Shanidar cave provided shelter for humans over for at least 80,000 years and offers insight into the origins of mortuary practices. My research compares Shanidar with other Neandertal and modern Homo sapiens burials of the Middle and Upper Paleolithic and examines how difficult it is to determine if a burial was intentional. It also addresses the various conclusions drawn by anthropologists regarding the burials and how inferring the beliefs of prehistoric cultures that last inhabited the earth over 30,000 years ago based on such sparse and subjective archaeological evidence is not a very reliable method. The specific topics addressed are body position, spirituality, symbolism, and medicinal knowledge.

UG3

THE RELATIONSHIP BETWEEN INTIMATE PARTNER VIOLENCE AND MENTAL HEALTH STATUS AMONG TENNESSEE HIGH SCHOOL STUDENTS

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Existing studies indicate that all forms of intimate partner violence (IPV) including physical forms causes mental distress. However, most research into IPV focus on adults. This study assessed the relationship between IPV and mental health status among high school students in Tennessee from years 2003-2011. Methods: Using data from the self-administered 2003-2011 Tennessee Youth Risk Behavior Surveys the selected independent variable was IPV victimization. The dependent variables were; signs of depression, suicide ideation, suicide planning and, suicide attempt. Results: Odds ratios were calculated for each variable examined. Significant results included experiencing; 2003 IPV and signs of depression, (OR= 2.50 [2.12-2.95]), IPV and suicide ideation, (OR= 2.28 [1.41-3.70]), IPV and suicide planning (OR= 2.54 [1.52-4.24]), IPV and suicide attempt (OR=5.55 [3.04-10.14]) 2005 IPV and signs of depression, (OR= 2.05 [.82-5.16]), IPV and suicide planning (OR= 2.18 [1.40-3.41]), IPV and suicide attempt (OR=2.85 [1.89-4.32])2007 IPV and suicide ideation, (OR= 2.30 [1.26-4.22]), IPV and suicide planning (OR= 2.09 [1.10-4.01]), IPV and suicide attempt (OR=3.44 [.58-20.57]) 2009 IPV and signs of depression, (OR= 3.28 [2.32-4.66]), IPV and suicide ideation, (OR= 3.17 [2.75-3.67]), IPV and suicide planning (OR= 3.52 [2.62-4.75]), IPV and suicide attempt (OR=4.42 [3.15-6.22]). 2011 IPV and signs of depression, (OR= 3.53 [2.69-4.69]), IPV and suicide ideation, (OR= 2.79 [2.21-3.53]), IPV and suicide planning (OR= 2.89 [1.90-4.43]), IPV and suicide attempt (OR=3.12 [2.22-4.45]) Conclusions: The noteworthy relation between high school students who report IPV victimization and the selected mental health variables over the years have continued to indicate a need for more prevention efforts, health promotion, and in-depth study to better understand the issue among this population.

UG4

SCHOOL-BASED VIOLENCE: THE RELATIONSHIP BETWEEN PHYSICAL FIGHTING AND CARRYING WEAPONS AMONGST HIGH SCHOOL STUDENTS IN TENNESSEE

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Purpose: School-based violence is a national problem often associated with significant physical and psychological consequences. This study examined associations between physical fighting and possession of various weapons among high school students in Tennessee. **Methods:** Data from the self-administered 2009 Tennessee Youth Risk Behavior Survey was examined using questions related to fighting and possession of weapons. Physical fighting and weapon carrying prevalence as well as odds ratios were calculated to describe the relationship. **Results:** Overall, 11.3% and 5.1% of students were involved in fighting or carried a weapon respectively on school property. Students involved in fighting on school property were 3.1 (CI, 1.37-7.2) times more likely to report carrying a weapon on school property compared to those who were not in a fight.

Conclusions: The association between physical fighting and weapon possession requires program planners to consider both issues when designing violence related interventions among this population.

UG5

SPECTRAL AND POLARIZATION ENTANGLEMENT SWAPPING IN TWO PAIRS OF TWIN PHOTONS

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Quantum entanglement is a property of a quantum mechanical state of a system of two or more objects in which the quantum states of the constituting objects are linked together so that one object can no longer be adequately described without a full description of its counterpart --- even though the individual objects may be spatially separated. Properties as such are fundamental to the realization of super fast quantum computing and completely secure quantum communication. In some specially designed systems it is possible to generate particles of light (photons) which reveal quantum entanglement. An optical system made of a nonlinear crystal known as barium borate crystal and laser beam of light is common source of twin photons with strong quantum entanglement under the process know as Spontaneous Parametric Down Conversion (SPDC). In SPDC a photon interacts with the BBO crystal and down converted into two twin photons. At a given instant of time these twin photons show different kinds of quantum entanglement, which could affect one another in a positive or negative way. In this study we have conducted analytical investigation in the effect of spectral entanglement on polarization entanglement in a particular physical scheme. The set-up in consideration consists of two polarization entangled photons, via spontaneous parametric down conversion, and two uncorrelated photons from two independent sources. For all possible two photon measurement outcomes, we will study the degree of the entanglement of the other two photons' collapsed state.

UG6

MEASURING THE CONTRIBUTIONS OF MORPHOLOGY AND PROSODY WORD READING AND COMPREHENSION

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Psychology

College students with no history of reading problems incorrectly chose that words like soggy contained two morphemes and words like bony had one morpheme. Scores on the morpheme awareness test, designed for elementary school age children, accounted for unique and significant variance in word reading ability and fluency after the effects of decoding and vocabulary were accounted for in regression analysis. Findings suggest that deficits in explicit morphological knowledge are not unique to individuals with language and reading disabilities and continue to explain differences in reading outcomes through adulthood.

UG7

INATTENTIONAL DEAFNESS AND ATTENTIONAL ENGAGEMENT

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Psychology

Inattentional blindness is a term describing what happens when an individual fails to perceive what can be a seemingly distinctive stimulus when their attention is otherwise engaged. Inattentional blindness is germane to the study of attention and cognition, and the present experiment seeks to delineate it in audition, which has not yet received the same level of examination as vision. Forty-nine undergraduate students listened to the same clip of a family dinner, which contained a divergent obscenity embedded within it. One group heard more of the dinner scene that preceded the target word than the other. The group that listened to the shorter clip was 37.1% more likely to perceive the target than the former group. It was hypothesized that the group hearing the longer clip became more engaged in the semantic content of the scene, thus retaining fewer attentional resources with which to detect and remember the target word.

UG8

COMPARISON OF HEART RATE BETWEEN INDIVIDUAL PERSONAL TRAINING AND VIDEO GUIDED EXERCISE.

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Exercise Science

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Exercise Science

There is limited literature and research on the subject of the effects on heart rate when participating in one on one personal training and video guided exercise. The purpose of this study is to understand which type of training will illicit a higher heart rate. This knowledge may help to determine the effectiveness of these training styles within the fitness market.

Participants chosen were moderately sedentary males between 140-210lbs and between the ages of 18-25. The participants had no prior experience with personal training. The participants were randomly assigned to two separate groups. Group 1 was accompanied by a personal trainer performing various types of circuit style training including Squat jumps, rope jumping, jumping jacks, alternating Heisman's, and alternating lunges. There was a dynamic stretching warm-up phases that lasted approximately 10 minutes. It included walk out lunges with instep, knee to chest pulls, quad walkouts, alternating lateral lunges, high knees, crossovers and arm swings. Each exercise took 60 seconds and was followed by 30-45 seconds of rest and then repeated once. Each complete session lasted approximately 30 minutes. The actual workout phase was only 20 minutes. Each session was followed by a cool down phase. The second group did the exact same session but instead watched the same trainer on a pre recorded video. The groups alternated between one on one personal training and video guided training sessions every week.

UG9

USING MICROSCOPIC INVERTEBRATES AS INDICATORS OF ENVIRONMENTAL CHANGE IN LAKES IN TENNESSEE AND VIRGINIA

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Geosciences

The states of Tennessee and Virginia have few natural lakes, with most lakes in these states created by the impoundment of streams to create swimming holes, ponds for watering cattle or horses, drinking water reservoirs or for flood control. These lakes face a variety of pollution sources such as run-off from agricultural and urban sources and acid mine drainage.

Thecamoebians (testate amoebae) are microscopic, single-celled organisms that build a mineralized shell which is preserved in the fossil record. They are found in all freshwater environments, including those with sufficient moisture such as tree bark, wet moss, wet soil, and peatlands. In the last 35 years they have been used increasingly in paleoenvironmental studies to detect eutrophication, deforestation and land clearance, pH and salinity changes, and heavy metal and organic pollution. These studies have been mostly limited to Canada and Europe. We have sampled lakes in Tennessee and Virginia to determine the utility of thecamoebians as a cost-effective tool to assess water quality change in the southeast. Preliminary samples from an urban lake in Tennessee have identified species which are indicative of a stressed and eutrophic environment. Samples taken from the lakes in rural areas of Virginia have assemblages that are more diverse but still dominated by opportunistic species indicating impairment, possibly due to coal mining in the region. Sediment cores have been collected to analyze changes in thecamoebian populations in the decades since impoundment to determine if recent changes in land-use or pollution of the lakes can be distinguished in the fossil record.

UG10

LETHAL AND NONLETHAL SCALPING AT THE ARNOLD SITE: WHO LIVED AND DIED?

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Virginia Lucas Undergraduate
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The Arnold Site (A.D. 1200-1600) is a Mississippian Period village and cemetery in the Middle Cumberland region surrounding present-day Nashville, Tennessee. Among Mississippian sites in this area, the skeletal sample from Arnold exhibits an unusual frequency of scalping trauma, with several cases of lethal scalping and at least one case of nonlethal scalping. This research explores the demographic parameters of the entire Arnold sample, and then compares the general population to those who were scalped, and to the smaller subset of scalping survivors. In addition, we consider rates and types of trauma across this sample, and evaluate how well the subset of scalped individuals represents the entire sample.

UG11

MUSIC AND PERFORMANCE

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Taz Maston (Undergraduate)
Exercise Science

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Exercise Science

Background: Researchers have found that music effects heart rate and RPE (Rate of perceived exertion). However the level of this effect is unknown. The purpose of this study is to test if music can affect college students by increasing their performance physiologically and psychologically during a one-mile run/walk. Methods This study was submitted to the Middle Tennessee State University IRB and received approval. All participants were randomized and placed into 6 groups of 5. Participants completed two one-mile runs at different sessions while wearing a heart rate monitor. The sessions were counter balanced with participants listening to music either during the first or second trial. Although individuals in each randomization groups completed trials at the same session participants ran alone during both sessions. All sessions took place at the Middle Tennessee State University's track in the recreation center. Here, a mile on the track is approximately equal to 6.5 laps. The main outcome of our study was to compare participant's time to complete a one mile run (i.e. aerobic capacity).

Results/conclusion: During this poster presentation the relationship between music, heart rate and RPE will be discussed.

UG12

COUNTERBALANCING POLITICAL RHETORIC IN THE NEW SOUTH: THE INTERSECTION OF POLICY VERSES PERCEPTION IN MIDDLE TENNESSEE

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Traditionally, U.S. immigrants have concentrated in areas in the southwest regions of Texas, Arizona, Nevada, and California; however, “beginning in the late 1980s, a domestic migration of young mexicanos following the contours of economic growth from cities in Texas and California to locals across the South.” This migration to the southeast region of the country has led to an influx of not only immigrants, but also differing attitudes towards migrants and the ways in which they affect traditional American society. Tennessee is no exception. The Tennessee State Legislature, with its recent change in political party power, is now more focused on immigration issues than ever. This study aims to prove that an average college student in Middle Tennessee is more likely to agree with a particular piece of public policy when disadvantageous rhetoric is extracted in the framing of an issue in contrast to the use of traditional political dogma that is often associated with a controversial topic. The study draws upon a 20 question, 494 participant survey from the Middle Tennessee State University student population. The study uses the Development, Relief, and Education for Alien Minors Act as the policy of choice to gauge respondent’s empathies toward immigrant communities, as well as other questions that determine preconceived stereotypes and attitudes towards these groups with the use of “hot-button” words scattered throughout the survey.

UG13

AN ECO-FRIENDLY SOLAR-POWERED BOAT

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Energy conservation continues to be a primary concern throughout societies across the world. Increasing concerns about the longevity of a system that is so heavily dependent on fossil fuel consumption, as well as its impact on the environment, have stimulated the introduction and development of a multitude of alternative energy solutions. One of the premier sources of alternative energy under consideration today is solar power. The goal of the Solar Splash Competition, in which Middle Tennessee State University is an active participant, is to explore and develop mechanisms to maximize the efficiency of a solar powered electrical system with a predetermined and finite amount of power. This presentation will provide an overview and analysis of MTSU's 2012 solar boat and its systems, with an emphasis on our attempt to maximize electrical and mechanical efficiencies via drag reduction, the optimization of overall photovoltaic output, and, the minimization of electrical power losses. Our overall goal is to further develop these methods of increasing efficiency so that they may be applied to other systems, thus rendering photovoltaic power as an increasingly feasible solution to the global energy crisis.

UG14

TRICKING TASTE BUDS: EXAMINING TASTE CONFIRMATION BIAS ON NON-TASTERS AND SUPERTASTERS

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Psychology

Previous research by the present authors suggests product packaging information leads to a “taste confirmation bias” by guiding consumers’ search for and interpretation of flavors. The present study tests the effects of taste sensitivity on this bias. To assess taste sensitivity, participants tasted filter paper impregnated with 6-n propylthiouracil and rated the intensity of the flavor using a 10-point Likert type scale. Based on a median split, participants were divided into low and high taste sensitivity groups. Participants sampled either regular or salt chocolate wrapped in ingredient-deceptive packaging. Through the use of deceptive product packaging, half were exposed to ingredient information suggesting the chocolate was salty; the other half were led to believe (erroneously) the chocolate was regular dark chocolate. Specifically, the packaging prominently displayed sea salt as an added ingredient in the chocolate, or it did not. Thus, those who viewed the packaging describing chocolate with added sea salt sampled normal chocolate, whereas those who viewed normal chocolate packaging sampled chocolate with added sea salt. Participants rated the saltiness of this chocolate using a 10-point Likert type scale. As predicted, such packaging affected the taste perceptions of non-tasters more strongly than supertasters. A 2 (chocolate type) x 2 (taste sensitivity group) analysis of variance on saltiness ratings revealed the predicted interaction, $F(1,58) = 5.15, p < .05$. Among the low taste sensitivity group, those who sampled the regular chocolate (mis-labeled as salt chocolate) rated it as more salty than did those who sampled the salt chocolate (mis-labeled as regular chocolate). Thus, for this group, the chocolate’s packaging appeared to be the primary factor influencing its perceived flavor. In contrast, the high taste sensitivity group rated the two types of chocolate as comparably salty. Thus, in this group, ingredients and product packaging had an equal, diverging impact on perceived saltiness.

UG15

THE EFFECTS OF BLOOD PARASITE LOAD ON WBC COUNTS IN COTTONMOUTHS (*AGKISTRODON PISCIVORUS*)

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Biology

Hemogregarines are blood parasites that infect erythrocytes. They have been shown to cause liver damage in mammals and monocytosis in lizards and potentially may affect numbers of other leukocytes and cause stress to the animals. Leukocyte differentials have been used to measure stress in several types of vertebrates including reptiles. We hypothesized that numbers of different types of leukocytes would be correlated with parasite load. Cottonmouths were collected at Caddo Lake, TX in May 2011, blood samples were taken by tail clip and smears were made in the field on glass slides. Slides were fixed in ethanol and stained with Giemsa before examination by light microscope. Pictures were taken of each field of view to enable ease of counting and to keep a record of fields that were counted. Sufficient fields of view were photographed such that at least 150 leukocytes were counted and identified for each snake. RBCs and parasites were also counted in all fields. Correlations were run to examine relationships between different WBCs and parasite load as well as between different types of leukocytes. A relationship was found between heterophils and the parasites ($r= 0.5025$; $p=0.056$). A positive relationship was found between heterophils and lymphocytes and thrombocytes ($r=0.5724$, $p=0.026$; $r=0.6123$, $p=0.015$). A positive relationship was also found between lymphocytes and thrombocytes ($r=0.6484$; $p=0.009$).

UG16

THE ROLE OF PINNA FEATURES IN VERTICAL PLANE LOCALIZATION

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Psychology

The pinna plays a major role in vertical plane localization of sounds, but how much of a role does each individual feature contribute? We sought to replicate the Gardner & Gardner (1973) study and, by making use of the pinna model information from Shaw (1982), to more clearly explicate the role of individual parts of the pinna. We followed the previous protocol with progressive filling of pinna cavities. However, we expanded the vertical range (in the median sagittal plane) from the original $\pm 18^\circ$ to a more expansive region of $\pm 45^\circ$. The contribution of the individual features of the scapha, fossa, and upper and lower concha has been examined by using smaller molds than those utilized in the original study. This has allowed us to observe the effect of each feature, rather than using the subtraction method of Gardner & Gardner. We have observed major changes in the distribution pattern of the median sagittal plane responses, an aspect of the original experiment that was not reported, and perhaps not observed, due to the limited range of loudspeaker placement. The error index utilized by Gardner & Gardner did not allow for a determination of changes to patterns of responding. Our analysis of the data, from six of an expected ten subjects, demonstrates that errors in identifying broad band noise stimuli occur for higher placed (degree) loudspeakers when the fossa is occluded and even more so when the upper, lower, and complete concha are occluded. Occlusion of the upper, lower, and complete concha results in the compression of perceived location, as subjects identified the origin of the stimulus as originating closer to the 0° position. This compression is observed for the upper most loudspeaker locations and, to a lesser extent, the lower most locations.

UG17

CHILD LIFE SPECIALIST: PERCEPTIONS OF TRAINING PROGRAMS AND PRACTITIONERS

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Psychology

A certified child life specialist is a professional whose main focus is the psychosocial well-being of children and their families (Cole, Diener, Wright, & Gaynard, 2001). These professionals work mainly in hospitals and other healthcare facilities to provide support to children and their families through therapeutic play, preparation for medical procedures, education, and self-expression activities (Child Life Council & Committee on Hospital Care, 2006). They address the psychological, developmental, social, and physical health of children and places importance on each of these areas in order to achieve successful health outcomes (Gaynard, Hausslm, & DeMarsh, 1989). The child life specialists aid children and their families in coping with the stresses that accompany hospitalization and illness (Bandstra et al., 2008). There is very limited research concerning the academic training available to those seeking to become child life specialists. Between 1988 and 1992, undergraduate and graduate enrollment for child life programs increased by 31% (Snow & Triebenbacher, 1996). This same study found that of the 852 child life workers that participated, 57% had an undergraduate degree and 43% had a graduate degree. This study, however, is 16 years old. The purpose of the current study was to explore academic programs that are currently available in child life and to assess the range of course offerings available within these programs. An additional purpose of the study was to explore the experiences and perceptions of current child life specialists and compare those to the academic training that is currently offered. The findings from these surveys will be discussed.

UG18

INDIVIDUAL DIFFERENCES IN EMBODIMENT

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A review of the embodiment literature suggests that there are at least two types of embodiment tasks. For input embodiment tasks, participants' movements and perceptual simulations are influenced by environmental events (e.g., a sentence like "open the drawer" makes it more difficult for a participant to move their hands away from their body). For output embodiment tasks, the way that participants are holding their bodies affects perception of environmental events (e.g., smiling makes cartoons look funnier). The purpose of the research reported here was to evaluate whether or not the two types of embodiment tasks are supported by different types of processing while simultaneously investigating possible individual differences in embodiment (e.g., are some people more influenced by input or output embodiment tasks). Participants completed prototypical input and output embodiment tasks along with tasks measuring ideomotor susceptibility and facial feedback susceptibility. Relationships between embodiment tasks and individual differences are reported.

UG19

THE EFFECTS OF MEDICINE BALL TRAINING ON THROWING VELOCITY

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Exercise Science

Josh Teeters, Britani Taylor (Undergraduates)
Exercise Science

Vaughn Barry (Faculty)
Exercise Science

Background: Research articles show mixed data on whether medicine ball training increases throwing velocity. The purpose of this study is to determine the effects of upper body medicine ball training on a person's throwing velocity. Methods: This was a six-week study training two days a week for approximately 30 minutes each day. Upper body plyometric medicine ball training was performed with slight progression in intensity. After the first three weeks of training two repetitions were added to each set and weight was increased by 1 kg. Exercises included triceps extension, chest press, standing over-head throws, sitting double arm throws, and slams. A proper warm-up and cool down was supervised during testing and training. Throwing velocity testing was done prior to and following the study. This testing consisted of 15 warm-up throws and 5 throws using maximum force. Testing and training took place in the AMG. A short survey about personal health and conditioning was completed by each participant prior to testing and training. Testers and trainers include Alanna Kirkpatrick, Britani Taylor, Melissa Hall, Josh Teeters, and Travis Byous. Results/Conclusion: During this poster presentation the relationship between medicine ball training and throwing velocity will be discussed.

UG20

THE EFFECT OF ORDER WITH AGILITY, SPEED AND ACCELERATION ON PERFORMANCE

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Health and Human Performance

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Previous research has concluded that the components of athlete's fitness such as agility, speed and acceleration can be affected by the order in which they occur. This is an important concept due to the competitive arena in sport when each athlete has to perform at his/her best to be considered in a certain position or to be competitive amongst other elite athletes. The purpose of our study is to further conclude if the effect of order of a testing sequence significantly affects performance outcome. Participants completed a testing sequence where the two tests, the arrow agility and the 30 meter sprint test, were rotated and data was recorded to determine if there is a significant difference in there times. Out of the 30 meter sprint test we observed their acceleration rate from the start to the 10 meter mark. Statistical methods were completed to determine if there were significant differences between the testing sequences.

UG21

A COMPARISON OF THE EFFECTIVENESS OF TWO TRAINING METHODS ON VERTICAL JUMP PERFORMANCE.

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Health and Human Performance/ Exercise Science

Vaughn Barry (Faculty Sponsor)
Health and Human Performance/ Exercise Science

Background: Multiple studies show that both Plyometric depth jump training and the traditional weight lifting method called the back squat produce an increased vertical jump. Few studies have compared the two methods within the same study, and more specifically, on the same population. The purpose of this study was to determine if one method was superior at improving vertical jump. Methods: This study was submitted and approved by the Middle Tennessee State University (MTSU) Institutional Review Board. The subjects participating in this study were the female MTSU cheerleaders. The cheerleaders were randomized into the two groups by drawing 14 names out of a hat and placing them into 2 equal groups. Group 1 performed five weeks of Plyometric depth jump training twice a week at the Elite Energy facility. Their sessions consisted of 3 sets of 10 repetitions. Group 2 performed five weeks of back squat training twice a week at the MTSU Recreational Center. Their training sessions consisted of 5 sets of 3 repetitions. All sessions were supervised by trained personal and study researchers. Pre- and post training vertical jump tests were performed to assess group vertical jump improvements. These tests were completed using the Vertec measurement tool. Each participant performed the jump without stepping or running into the jump. Results/Conclusion: The poster presentation will provide insight on the relationship between the Plyometric depth jump and back squat training methods.

UG22

SYNTHESIS OF CYCLOPROPYL PEPTIDOMIMETICS AS POTENTIAL BACE AND HCV NS3-4A PROTEASE INHIBITORS

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The utility of peptidomimetics as enzyme inhibitors is well documented in the pharmaceutical field. HIV protease inhibitors have been particularly successful, with ten marketed peptidomimetics. Their success has led to activity in other areas, including inhibition of other viral enzymes such as the Hepatitis C protease HCV NS3-4a. Peptidomimetics are also in development as inhibitors of beta-secretase (BACE) for the treatment of Alzheimer's disease. However, relatively few syntheses of semi-rigid cyclopropyl analogs have been reported. A three-step synthesis of a core cyclopropyl-containing peptidomimetic has been developed in our laboratory: Grignard addition to amino acid Weinreb amides provides enones that are substrates for the cyclopropanation. Extension of the core cyclopropyl products to provide compounds that may be expected to have activity as either BACE inhibitors or HCV NS3-4a protease inhibitors will be presented here.

UG23

THE ACUTE EFFECTS OF VISUAL STIMULATION ON HEART RATE DURING EXERCISE

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Health and Human Performance / Exercise Science

Jared Ashworth (Undergraduate)
Health and Human Performance / Exercise Science

Aaron Scott (Undergraduate)
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Lori Gessell (Undergraduate)
Health and Human Performance / Exercise Science

John Coons (Faculty Sponsor)
Health and Human Performance / Exercise Science

While many studies have been done on the effects of auditory stimulation on heart rate during exercise, there is a limited amount of data on visual stimuli. The purpose of this study is to examine the effect of different visual stimuli on heart rate during exercise. Participants will be males ranging in age from 18 to 24 years old. Participants will be fitted with heart rate monitors and tested while riding a cycle ergometer at 50 revolutions per minute. After reaching steady state the participants will be shown either an action or drama video montage or will have no stimulation. The hypothesis is that drama and action movie clips will effect the heart rate in inverse directions, with the action clips elevating the heart rate and the drama clips slightly decreasing it. All data will be analyzed through analysis of variance using the statistical computer software program Statistical Packages for the Social Sciences (SPSS). Relationships between heart rate and visual stimulation will be reported.

UG24

MUSIC'S EFFECT ON HEART RATE DURING EXERCISE

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Exercise Science

Josh Benson (Undergraduate)
Exercise Science

Vaughn Barry (Faculty Sponsor)
Exercise Science

Background: There are several studies that look at the effects of music on heart rate during exercise. However, there is varying results among these studies. The purpose of this study is to compare the effects of music on exercise heart rate and perceived exertion.

Methods: After completing the informed consent, participant completed baseline measurement including heart rate, blood pressure, height, weight, and BMI. Once all the baseline measures were taken participants mounted a cycle ergometer and pedaled at a low resistance of .5 kiloponds for 3-5 minutes. Once in steady state a heart rate was recorded using the polar heart rate monitor. Once this was achieved, participants listened to music while pedaling for 10 minutes. The heart rate and rating of perceived exertion were recorded every minute. After the 10 minute period, participants pedaled for another 3-5 minutes at a low resistance of .5 kiloponds. The participant then rested for 20 minutes and repeated the test two more times with a different variation of music: fast, slow, and no music.. The order of music was counter balanced throughout the study.

Results/Conclusion: During the poster presentation, the relationship between the three music types compared to heart rate and perceived exertion will be discussed. Further questions about the procedures will also so be discussed upon request.

UG25

FROM THE MIDDLE EAST TO THE SOUTHEAST: HOW UNIVERSITIES SET THE AGENDA

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Mass Communications

Emma Egli (Undergraduate)
Mass Communications

Ken Blake (Faculty Sponsor)
Mass Communications

Bernard C. Cohen wrote, “The media doesn’t tell us what to think; it tells us what to think about.” Through their day-to-day selection and display of the news, journalists focus our attention and influence our perceptions of the most important issues. While traditional journalism norms emphasize that the media are simply trying to inform and not persuade, today we have come to terms with the fact that the media can’t help but exert significant influence on our perceptions. As journalists, we are intrigued as to how and why the media holds this type of power. Based on newspaper archives spanning from 2000 to 2011 from two Tennessee universities--Middle Tennessee State University and the University of Memphis--this study looks for, and finds, evidence of second-level agenda setting in the attributes each university gives to news stories pertaining to the Middle East. The study found that the attribute agenda for each university was different. The findings suggest that based on the demographics of the learning institution, attributions about the Middle East will be different from publication to publication.

UG26

STRIDE LENGTH COMPARISON OF SHOD VS. BAREFOOT RUNNING

Robert Morgan, Heather Davisson, Dishonique Brooks (Undergraduate)
Exercise Science

Leigh Washington (Undergraduate)
Exercise Science

Garrick Hock (Undergraduate)
Exercise Science

Vaughn Barry (Faculty)
Exercise Science

Background: Several research articles have concluded that minimizing stride length is beneficial for runners for various reasons. Barefoot and mock barefoot running has been said to decrease the stride of a runner. The purpose of this study is to evaluate the immediate differences in stride length of a runner who is shod or barefoot. Methods: Participants were active male and female Middle Tennessee State University students younger than 30 year old. Participants were excluded if they had a BMI over 30. Runners were asked to participate in approximately one hour of data collection. Following a proper 10 minute warm up supervised by study staff, runners stood on soaked towels and asked to run until six to eight strides could be measured. Upon finishing the run, researchers followed behind and marked the toe of each right foot. The difference between each mark was considered the stride length. Results/Conclusion: During this study runners showed a decrease in barefoot stride length. This shows a significant relationship between barefoot running and decreasing stride length. Therefore, barefoot running when compared to shod running may reduce the risk of common running injuries.

UG27

THE ACUTE EFFECTS OF STATIC STRETCHING ON BALANCE

Jordan Stumph (Undergraduate)
Exercise Science

KaDarra McKissack (Undergraduate)
Exercise Science

Mark Chambers (Undergraduate)
Exercise Science

Stephen Henry (Undergraduate)
Exercise Science

John Coons (Faculty Sponsor)
Exercise Science

Balance has been found to be a significant component in everyday life as well as an imperative component of fitness. An important aspect in reducing injury in both athletes and non-athletes is balance training. Benefits that come with balance training include stability, the strengthening of muscles, increasing the rate of force development, and improving muscular power. Stretching is also just as important. It has been found that stretching helps the sports performance of athletes as well as increasing range of motion. The different types of stretching have different effects and benefits on the body. It is unknown though, if static stretching has any effect on balance abilities. The purpose of this research is to assess the whether static stretching has any effect on balance performance. Participants completed a warm up and static stretching routine as well as just a warm up routine and then had their balance tested on two separate occasions. The effects of static stretching on balance are reported.

UG28

APPLYING RESEARCH PROTOCOLS TO A DESIGN PROPOSAL FOR COMMUNITY CARE OF RUTHERFORD COUNTY

Bridgette Schwarz, Melissa Mills, Erica Jenne, Megan Richter, Emily Allman, Ana Maria Cortes-Poveda, Amanda Gentry (Undergraduate)
Human Sciences/Interior Design

Sara Gibson, Arielle Vogel, Kimberly Willis
Human Sciences/Interior Design

Janis Brickey (Faculty Sponsor)
Human Sciences/Interior Design

Students enrolled in Human Sciences Advanced Problem Solving 4054 Fall 2011 developed a design proposal for Community Care of Rutherford County. Students applied a problem solving method known as design programming developed from qualitative research methodologies. Community Care is a senior living facility focused on multigenerational opportunities such as the onsite daycare for young children. The problem area is the main Activities Room where residents are monitored while watching television, engaging in crafts, and visiting with family members. Students followed Human Subjects protocols and met with the Activities Director to inspect the space and collect measurements. Information on the use of the room and perceptions was collected through observations of the users in the space during key times of the day during major activities, extensive interviews with staff, and telephone interviews with family members of residents. Themes or design problems were generated with the analysis of the data. Students developed a preliminary plan using existing furniture to divide the room for television viewing and opportunities to sit in more residential groupings with visitors. The room was re-arranged and window film was installed over one section of windows to provide more natural daylight in the area. The next week, staff reported that residents enjoyed the layout and the floor plan was repeated in a smaller activities room. Students developed a presentation including a budget and additional recommendations that are under consideration. The proposal was submitted to the IDEC (Interior Design Educator Council) Social Responsibility Network Make a Difference Project2.

UG29

WHAT LIES BENEATH: PRELIMINARY ARCHAEOLOGICAL INVESTIGATIONS OF A MIDDLE TENNESSEE CAVE

Joey Keasler (Undergraduate)
Anthropology

Tanya Peres (Faculty Sponsor)
Anthropology

In a small grove of trees, less than fifty yards from a busy highway, is a shallow sinkhole with a very interesting past. The sinkhole is the midpoint entrance to a small cave. The history of the cave ranges from a hiding place for livestock during the Civil War, a speakeasy during the 20's, and a restaurant/dance hall in the late 30's. These may have been the only stories that would ever be told about this cave until 2004, when the local Sheriff's Department received a call concerning human remains inside the cave. It was determined that the remains were those of Native Americans based on skeletal traits and dentition. This poster chronicles the initial survey of the cave and what was found.

UG30

"WAY TOO MUSIC" - AN ART ORGANIZATION PLAN

Wei Xu (Undergraduate)
Speech and Theatre

Virginia Donnell (Faculty Sponsor)
Speech and Theatre

This presentation will feature a hypothetical plan for a non-profit arts organization created for THEA 3800: Introduction to Arts Management. The presenter will illustrate the organizational plan and operations for "Way Too Music" -a music touring company in Nashville, Knoxville, Chattanooga and Murfreesboro area. The company is dedicating to make students interested in music by exploring, experiencing and creating classical music via classroom, music concerts and other vehicles. For example, the company will provide four major events at different schools during a school year. These events will be helping students get to know their new schoolmates –instrument competition, at the beginning of fall semester; playing a song on a selected instrument for family before Thanksgiving Day; learning worldwide music on St. Patrick's Day as well as writing a song for Father's Day. The organization consists of 38 administrative employees, 7 street members, and 13 artists. The company expects the leader to be a monitor, spokesperson, entrepreneur and a negotiator at the same time; Way Too Music also likes to combine analytical, organic and system management styles together.

UG31

CONSUMER'S ATTITUDES ON CELEBRITY ENDORSEMENTS AND FASHION BRAND IMAGE

Elizabeth Beasley (Undergraduate)
Human Sciences

Jasmin Hyunju Kwon (Faculty Sponsor)
Human Sciences

Celebrity endorsements for brands have been increasing over the years. Consumers will purchase an item with a celebrity endorsement attached to it if the celebrity means something to them or has a good reputation. If a celebrity does not mean anything to them or has a bad reputation they will be less likely to purchase the endorsed item. The pairing of the celebrity along with the fashion brand is crucial in determining whether or not consumers will respond to the products. Fashion marketers hope to transfer consumer's positive feelings toward the celebrity to the product the celebrity endorses. Consumers respond well when the celebrity image matches the brand's image; they do not respond to pairings where the celebrity image doesn't seem relevant to the brand's image. The purpose of this study was to examine consumer attitudes toward celebrity endorsement and to show how a celebrity's image can affect the brands that are endorsed by them. Out of 150 questionnaires distributed to college students, ninety-three were usable for research. The questionnaire consisted of 6 yes/ no questions regarding celebrity endorsements and brand image and 2 questions requesting the respondents to pick a product from a set. Findings suggest that females are more likely than males to purchase a product based on a celebrity endorsement. However when price is taken into consideration, both females and males will choose the cheaper product over the celebrity endorsed product. Age of the consumer also impacts the effectiveness of this; the younger the consumer the more likely they are to purchase a celebrity endorsed product. Recommendations for further research are suggested.

UG32

HUMANS IN CRISIS ASSISTS ABUSED WOMEN AT THE WOMEN'S FOUNDATION IN NEPAL

Mark Bowman (Undergraduate)
Geosciences

Hari Garbharran (Faculty)
Geosciences

Faculty Sponsor: Hari Garbharran, Geosciences

Humans in Crisis is a grassroots United States charity and non-governmental organization whose mission is empowering communities in need through education and innovation. *Humans in Crisis* of Middle Tennessee State University is a student organization that is a chapter of HIC International. The Women's Foundation in Nepal started in 1988 and today has thousands of members, 12 district offices all over Nepal, two child care centers, several shelters for survivors of abuse, a working organic farm, an onsite textile production center, and many educational services. One of the 2012 projects *Humans in Crisis* is assisting the Women's Foundation with the abused women's shelter. *Humans in Crisis* has been raising money for the abused women at the Women's Shelter by selling hand-made silk scarves and generating US markets for their products. The goal is to help our partners to generate sufficient revenue allowing the Women's Foundation to have 100% self-sustainable programs and services. Maheela (the word for woman) produce woven textiles, largely shawls and scarves using cotton, pashmina, silk and wool fabrics. Students at MTSU help in advertising and selling these Maheela scarves since the revenue also provide a percentage of profits and above-average pay for it's members. In 2010 and 2011 *Humans in Crisis* helped raise \$6250 for the Women's Foundation through the sale of the scarves. To assist with capacity building and sustainability, Humans in Crisis will assist the Women's Foundation in putting together a business framework to assist the women from the shelter who are ready to become entrepreneurs and break out on their own. Training will be centered around putting together a business plan and accessing microloans to get their small business set up and moving.

UG33

SCHOOL 2 SCHOOL PROGRAM

Mark Bowman, Antonio Bastian (Undergraduate)
Geosciences

Hari Garbharran (Faculty Sponsor)
Geosciences

The School 2 School project has been instituted by HIC, whose mission is to empower communities through education and innovation. One of its 2012 projects is to link schools in Middle Tennessee, South Florida and Los Angeles with partnership schools in Nepal. Initially, schools in the US will be matched with similar grade level schools located in our partnership Nepal schools. The plan is to get teachers and students connected across continents and cultural divides. During Phase 1 of the project, Humans in Crisis will begin with target schools in Middle Tennessee from February through March, 2012 and set up links with Nepali schools. The School2School initiative promotes cultural exchange through literacy and linking classrooms in the United States and Nepal. The School2School program envisions a pen-pal project that will connect US students with Nepali students and this will be facilitated by teachers in respective schools. Nepali partnership schools will include the Community School that educates orphans from the Women's Shelter and the children from the surrounding areas in Katmandu. The school, according to Renu Sharma, President of the Women's Foundation, has an enrollment of about 450 students and is staffed by 32 teachers, some in a voluntary capacity. US schools will also work with our partnership schools in Buddhanilkantha, Katmandu. These include Panchakanya Secondary School (Grades 1 through 12), Shree Ram Lower Secondary School (Grades 1 through 10), and Buddhanilkantha Higher Secondary School (Grades 1 through 12). This will be a good experience for our students since they will have an opportunity to communicate with students who have basic needs like winter clothes to allow them to attend school during the cold season. The School2School program will also include the Shree Antyodaya Janajati Awasiya Vidyalaya (henceforth 'Chepang school'). A total of 178 children having Chepang ethnicity are educated and boarded approximately 46 weeks per year at; of this total, 100 students are male and 78 female. Level of instruction ranges from Grades 1 through

UG34

SEX DETERMINATION: A STUDY OF SEXUAL DIMORPHISM IN COMPLETE AND FRAGMENTARY CUNEIFORM BONES

Amber Schmuhl (Undergraduate)
Anthropology

Hugh Berryman (Faculty)
Anthropology

Accurate sex estimation is a necessary step in the identification process. In 1976, Steele was one of the first researchers to examine sexual dimorphism among the talus and calcaneus. Since then, other researchers have repeated Steele's research and confirmed that these bones are useful in determining sex. These researchers have verified that the talus and calcaneus are sexually dimorphic and that the accuracy rates are repeatable. Other than the talus and calcaneus, little research has investigated the other tarsal bones for their potential in estimating sex and most of these studies require the tarsals to be in good condition. In 2009, Harris used The William M. Bass Skeletal Collection, to examine the maximum measurements of all seven tarsal bones. However, her study required the bones to be complete. The present study examines cuneiform bones from 100 adult individuals from the William M. Bass Skeletal Collection for their potential in sex estimation. This study not only includes the maximum measurements from complete cuneiform bones, but also devises eight new measurements dividing the bones into smaller segments. All data in this study was analyzed by applying discriminant function analysis through the use of FORDISC 3.0 (Jantz and Ousley, 2005). The results showed that not only were Harris' maximum measurements repeatable, but that the smaller dimensions of the bones can be equally useful. When all measurements are included, the medial cuneiform exhibited the most dimorphism of the three cuneiform bones. While some accuracies fell below 80% when taken individually, the rate raised above 80% if they were combined with at least one other measurement. This study has shown that even though the cuneiform bones are smaller than other bones, they can be equally useful in the estimation of sex whether they are complete or fragmented.

UG35

AFRICAN-AMERICAN STUDENTS' PARTICIPATION IN STEM MAJORS: FACTORING OUT FAILURE, STRIVING FOR SUCCESS

Paige Stubbs (Undergraduate)
McNair, Mathematics Education

Dr. Michaele Chappell (Faculty Sponsor)
Mathematics Education

Over the years, African-American students have been identified in the education arena as an underrepresented group in STEM (science, technology, engineering, and mathematics) disciplines. Researchers and advocates have sought reasons why so few African-American students make up the STEM graduate population. Many findings suggest overwhelming disparities are attributed largely to economic factors and academic preparation. However, a need remains to understand how to increase the graduation rate for African Americans in STEM disciplines. Explored in this research proposal are different factors that contribute to the successes and challenges of African American students in STEM disciplines. Focus is given to specific factors such as: parental involvement, socioeconomic status, neighborhood context, human and material resources, academic preparation, and student self-motivation. This study aims to identify whether or not these factors actually contribute to the success or deficiency of African-American students in STEM disciplines. Findings from this study will help advance opportunities for African-American students and the STEM fields overall. Afterall, STEM fields are critical to America's future success.

UG36

RESPONSE TO OPTICAL TRAPPING BY RED BLOOD CELLS FROM A TRANSFUSED SICKLE CELL PATIENT

Aline Pellizzaro (Undergraduate)
URECA, Biology

Anthony Farone, Mary Farone (Faculty)
Biology

Maria del Pilar Aguinaga (Faculty)
Meharry Medical College

Daniel Erenso (Faculty Sponsor)
Physics and Astronomy

Red Blood Cells (RBC) are responsible for delivering oxygen to body tissues by squeezing through capillaries narrower than the normal diameter of a RBC. However, this deformability of RBCs is drastically diminished in Sickle Cell Anemia (SCA), where the RBC's change their shape under deoxygenating conditions and lose deformability, occluding the blood vessels in the microcirculation. Blood transfusion is commonly used to treat SCA. We have studied the efficacy of this treatment by measuring the response of RBCs from a transfused SCA patient directly trapped by an optical trap, in comparison to RBCs from a person with normal hemoglobin. Blood from a transfused SCA patient was obtained from the Meharry Sickle Cell Center. The hemoglobin type assessment was done using Ultra2-High Performance Liquid Chromatography. The sample contained Hb (hemoglobin) S (53.68%), Hb A (39.72%), Hb A2 (3.60%) and Hb F (3.0%). We then conducted analysis in the RBC size distribution of both, the transfused SCA patient blood and normal hemoglobin blood from healthy donor. The size of RBCs from the transfused SCA patient blood has a wider range (~4mm-9mm) as compared to those from the normal hemoglobin blood sample (~4.8mm-7.2mm). We targeted those cells that have size range in the overlapping interval to determine whether transfused RBCs behave the same or differently in a foreign environment than those RBC's in their native environment. For a significantly large number of these cells, we have investigated the responses when they are trapped, released, and relaxed for a wide range of laser power that did not compromise the integrity of the cell. These responses are investigated by analyzing the relative change in deformation and the relaxation-time in comparison with RBC's from the normal blood sample.

UG37

GIS MAPPING OF FORAGE MICRONUTRIENTS

Michael Roberts (Undergraduate)
Agribusiness and Agriscience

Justin Gardner (Faculty Sponsor)
Agribusiness and Agriscience

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Agribusiness and Agriscience

A forage mineral survey was conducted by UT extension from 2001-2004 throughout Tennessee. Forage samples were taken from across the state and categorized by zip codes. The purpose of the survey was to evaluate forage nutrients in an attempt to explain widespread animal health issues in Tennessee's cow-calf herd. Micronutrients found in forage can have dramatic impact on animal health. Of specific concern are copper and sulfur. A copper deficiency can impair immune system function and sulfur binds with copper, thus decreasing the availability of copper in the forage. This survey was originally intended to assess forage quality so that animal nutritionists could develop supplements. During the course of the study researchers hypothesized that low levels of copper and high levels of sulfur were concentrated downwind from coal burning power plants. This project explores that hypothesis by geocoding the data and generating maps using Geographical Information Software (GIS). In addition we calculate the correlation coefficient between copper and sulfur and compute Moran's I in order to test for spatial correlation.

UG38

A COMPUTATIONAL INVESTIGATION OF THE GENERALIZED ANOMERIC EFFECT

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Honors College, Chemistry

Preston MacDougall (Faculty Sponsor)
Chemistry

The anomeric effect is a key factor determining the shapes of sugar molecules, such as ribose, and larger biomolecules containing sugar moieties, such as DNA and RNA. Despite its importance and usefulness in the area of molecular structure, scientists have struggled to determine the precise physical origin(s) of the phenomenon. The anomeric effect was studied through the topology of the Laplacian of the electron density. The associated Laplacian complementarity principle was applied intramolecularly to the compounds in this investigation. Ultimately, a strong positive correlation was found between the total energy of compounds exhibiting the gauche effect and the dihedral angle between key critical points (CPs) in the Laplacian. This trend was demonstrated across several very distinct species. The critical points under consideration were the non-bonding (3,+3) CPs around a heteroatom and the appropriate (3,-1) CPs around a central carbon. In addition to effects on energy, it was found that the alignment of certain CPs could result in a significant amount of charge displacement within a molecule (i.e. some CPs vanished depending on alignment). Financial support is acknowledged from the Honors College and from Office of Science, U.S. Department of Energy.

UG39

HUMAN IN CRISIS UPDATES SCHOOL LIBRARY FOR ORPHANS IN NEPAL

Antonio Bastian
Geosciences/Geography

Hari Garbharran (Faculty Sponsor)
Geosciences/Geography

Humans in Crisis International is a U.S. charity and non-governmental organization whose mission is empowering communities in need through education and innovation. One of its 2012 projects is to upgrade the library facilities at the Lalit Kaylan Kendra School in Nepal. The proposal is to upgrade school library facilities with new educational materials, including E-programs (DVDs) relating to various subjects apart from the books matching national curriculum for the students. The books and education materials will help the teachers in improving their teaching-learning activities and this will enhance education at the school catering for orphans. *Humans in Crisis* will work hand in hand with the Rotary Club of Yala (Annex-A) who will supervise and monitor all purchases and implementation activities. The club members will be actively involved in monitoring and implementation of this upgrade. The effectiveness of the outcome will be assessed on the basis of the comparison between the records maintained before the upgrading of the library and the end of the academic session relating to (i) students' involvement in library use facilities and borrowing books, (ii) achievement in their final exams in major subjects like Language, Math, Science and Social Studies, and (iii) teachers' use of reference books. All materials will be purchased on a competitive basis supervised by the Yala Rotary Club with maximum possible discounts on the published prices. Necessary arrangements will be made in keeping record of students' interaction and teachers' involvement in the library intact. In consent with the teachers, a library schedule will be made assigning teachers to take care of their students' interaction in the library and *Human in Crisis* will be fully involved throughout the process.

UG40

APPROACH TO THE SYNTHESIS OF BELACTOSIN A

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Honors College, Chemistry

Doleshwar Niroula (Graduate)
Chemistry

Norma Dunlap (Faculty)
Chemistry

Belactosin A is an anti-tumor proteasome inhibitor isolated from *Streptomyces*, which has promising activity against colon cancer and pancreatic cancer. The novel mechanism of action makes this an interesting target, and several approaches have been reported. A key structural feature is an aminocyclopropyl amino acid. A general approach has been developed in our laboratory toward the synthesis of cyclopropyl peptidomimetics from various protected amino acids. Addition of ethyldimethylsulfuranylidene to enones derived from amino acids affords cyclopropyl ketones. Reported here is the conversion of Cbz-L-serine to an cyclopropyl intermediate that is suitable for further elaboration to belactosin A.

UG41

OPTIMIZATION OF A GENOMIC DNA EXTRACTION PROTOCOL FOR DEVELOPMENT AND CHARACTERIZATION OF MOLECULAR MARKERS FOR THE SCLERACTINIAN CORAL, PORITES LICHEN

Mike O'Connell (Undergraduate)
McNair, URECA, Biology

Sarah Bergemann (Faculty Sponsor)
Biology

Genetic research has advanced our understanding of ecological and environmental factors that affect the genetic diversity in corals. However, the development, isolation, and characterization of molecular markers unique to coral DNA is confounded by the difficulty of obtaining pure coral DNA in the presence of symbiotic dinoflagellates (zooxanthellae). The objectives of this project are to determine the most efficient technique for separating zooxanthellae from the tissues of a scleractinian coral, *Porites lichen*, while maximizing the yield of high quality genomic DNA for isolation, characterization and enrichment of highly variable molecular markers. We found that the best technique involves scraping the tissue from the skeleton and separating symbiotic dinoflagellates from coral tissue through centrifugation. This was followed by an overnight incubation on a shaker in a solution containing a buffering agent, detergents and enzymes that dissolve proteins. Genomic DNA was further purified and isolated using a phenol-chloroform, binding DNA to GeneClean Turbo columns and further purification with ethanol washes.

UG42

COMPARATIVE STATISTICAL STUDY IN THE PHYSICAL PROPERTIES OF DIFFERENT HEMOGLOBIN VARIANT IN SICKLE CELL ANEMIA

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Chemistry

Anthony Farone, Mary Farone (Faculty)
Biology

Maria del Pilar Aguinaga (Faculty)
Meharry Obstetrics and Gynecology

Daniel Erenso (Faculty Sponsor)
Physics and Astronomy

Hemoglobin (Hb) is the iron-containing oxygen-transport metalloprotein in the red blood cells (RBCs) of almost all vertebrates as well as the tissues of some invertebrates. Hb in the blood carries oxygen from the respiratory organs to the periphery where it is released to facilitate the breakdown of nutrients that provide the necessary energy to maintain cell viability and for collecting the resultant carbon dioxide, which is subsequently brought back to the lungs to be dispensed from the organism. There are different types of normal and abnormal hemoglobin types, some of which are pathological variants while others are non-pathological variants. Normal hemoglobin types include Hemoglobin A (HbA), Hemoglobin A2 (HbA2), and Fetal hemoglobin (HbF). HbA makes up about 95%-98% of Hb found in adults. HbA2 makes up about 2%-3% of Hb. HbF makes up to 2% of Hb found in adults. HbF is the primary hemoglobin produced by the fetus during pregnancy and its production usually falls to a low level shortly after birth. The abnormal hemoglobin types in sickle-cell anemia (SCA) include hemoglobin C (HbC) and hemoglobin S (HbS). Both HbC and HbS are mutated Hemoglobin A resulting from substitution of a lysine residue (HbC) or valine residue (HbS) for a glutamic acid residue in the sixth position of the β globin chain. Three blood samples (HbASF, HbSC, and HbSF) from SCA patients were obtained from the Meharry Sickle Cell Center, Nashville, TN. The hemoglobin type assessment was done using a Ultra2-High Performance Liquid Chromatography. For each blood sample we took images of thousands of RBCs. By analyzing these images using image processing software (ImagePro 6.2), we have conducted comparative statistical study on several physical properties including diameter, area, and perimeter of the RBCs.

UG43

FDCA SYNTHESIS: AN ENVIRONMENTALLY FRIENDLY ALTERNATIVE TO PRODUCING POLYMERS

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Chemistry

Dwight Patterson (Faculty Sponsor)
Chemistry

Terephthalic acid (TA) is a common reactant in the industrial manufacturing of PET plastic which is commonly used for making plastic bottles and clothing. Though it is highly efficient in producing PET plastics, the production of TA presents a variety of issues for the environment in the form of both water and gas emissions. Some of these emissions include: p-xylene, methyl acetate, formaldehyde, and CO. Also, use of TA in PET production requires extremely high temperatures to react thus requiring large energy consumption. FDCA is a green alternative to TA for PET production. It is synthesized from the oxidation of HMF using a catalyst composed of hydrotalcite (HT) clay with gold nanoparticles suspended in the clay mixture under oxygen gas flow and in water at 368K (95 degrees Celsius). HMF, the main reactant in FDCA synthesis, can be synthesized from natural sugars: cellulose, fructose, and glucose which can all be found in the form of biomass. Unlike TA, HMF reaction with the gold catalyst has resulted in little to no byproducts, requiring a temperature that is relatively low, especially for industrial standards, and in a base-free aqueous medium. The conversion from HMF to FDCA using Au/HT catalyst has yielded an average of around 99% conversion making it highly efficient and a very good process to minimize byproducts.

UG44

NATURAL GAS FUELING CHANGE NOW

Justin Threlkeld (Undergraduate)
Journalism

Ian Weir, Kristen Walters, Brynne Henderson, Emilie Maple (Undergraduates)
Journalism

Tricia Farwell (Faculty Sponsor)
Journalism

MTSU Journalism students in an Advertising/Public Relations Campaign class are working with America's Natural Gas Alliance to generate a fact-based discussion about the benefits of natural gas as a domestic energy source. Research and campus-wide surveys have been conducting to generate a direction for the campaign. The students are required to maintain a budget as well as promote and advertise to the community. An event will be held on campus to promote natural gas and generate a buzz among the students. After the event, post-research will be conducted to analyze the effectiveness and execution of our event, advertising and public relations efforts.

UG45

A MODERN INTERPRETATION OF THE ACYLGLYCEROLIPIDS OF THE INDUSTRIALLY IMPORTANT ALGA, HAEMATOCOCCUS PLUVIALIS, USING POSITIVE-ION ELECTROSPRAY/MASS SPECTROMETRY/MASS SPECTROMETRY

Aaron Dahmen (Undergraduate)

Jeff Leblond (Faculty Sponsor)
Biology

Haematococcus pluvialis is a green, unicellular, freshwater alga which has become a topic of interest due to its ability to accumulate the ketocarotenoid, astaxanthin (3,3'-dihydroxy- β , β -carotene-4,4'-dione) under stressful growth conditions, including nutritional deficiency, high concentrations of NaCl, and variable intensities of light. In addition to the enhanced production of this compound, the induced stress introduces both a morphological and biochemical transformation from motile green vegetative cells into red cysts in which the rate of cellular division decreases exponentially. This change has been investigated with regard to the conditions which are necessary to promote carotenoid production and the biosynthetic pathway associated with it, as well as potential antioxidant properties of the pigment itself. Publications to date have provided a basic lipid profile identifying major fatty acids, and through our investigations we have begun to compile an updated and expanded lipid profile of this organism grown at 25°C under a light intensity of 300 $\mu\text{mol photons m}^{-2}\text{s}^{-1}$. We have utilized positive-ion electrospray/mass spectrometry (ESI/MS) and ESI/MS/MS to identify intact acylglycerolipids not identified in previous studies. We have determined that a cellular membrane polar lipid fraction was dominated with lipids that did not contain phosphorous but rather various forms of the phosphatidylcholine analog, diacylglyceryltrimethylhomoserine (DGTS), with primarily 16:0 and 18:3 fatty acids. Examination of the chloroplast membrane glycolipid fraction revealed primarily monogalactosyldiacylglycerol (MGDG) with primarily 18:3 and 16:4 fatty acids as well as digalactosyldiacylglycerol (DGDG) as a lesser contributor to the overall glycolipid fraction.

UG46

ANALYSIS OF SYNTHETIC CANNABINOIDS BY MASS SPECTROMETRIC METHODS COUPLED WITH ACCURATE MASS DETERMINATION

Dima Sbenaty (Undergraduate)
Chemistry

Nisha Patel (Undergraduate)
Chemistry

Ngee Chong (Faculty Sponsor)
Chemistry

The use of illegal synthetic cannabinoids has become increasingly popular over the past several years. These drugs have been successful in providing a “high” just like marijuana and yet these drugs and their metabolites can circumvent detection by most standard drug testing methods for natural cannabinoids. As a result, herbal products containing the synthetic cannabinoids such as JWH-018 and JWH-073 have become more appealing to drug users. These synthetic cannabinoids have shown harmful health effects in the human body and may even cause death from high concentrations of toxic compounds accumulated via extended drug abuse. It is therefore critical for these drugs and their metabolites to be identified and quantitatively determined by law enforcement and clinical laboratories. Although both GC-MS and LC-MS have been reported for determining synthetic cannabinoids in the herbal products and urine samples, there has not been any study of cannabinoid distribution in the gas and particulate phases of the smoke inhaled by the users. In this study, the smoke of the herbal products containing synthetic cannabinoids is studied in order to estimate the range of doses of the active ingredients in commonly available products. When the smoke samples were analyzed, it was found that the synthetic cannabinoids were not detectable in the gas phase but were detected in the particulate phase collected using a cascade impactor. This indicates that JWH-018, JWH-073, and other synthetic cannabinoids are inhaled in the particulate phase with a particle size fraction of less than 0.25 μm . The analysis also revealed that most of the flavor or scent additives for the herbal products were detected in the particulate phase. Further analysis using LC-MS with a time-of-flight mass spectrometer and ion mobility instrumentation allows the complete characterization of the synthetic cannabinoids and their related metabolites and by-products in the mainstream smoke samples.

UG47

ISOLATION OF NUCLEOSIDE METABOLIZING ENZYMES FROM PLANT SEEDS

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Chemistry

Irma Regalado (Undergraduate)
Chemistry

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Chemistry

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Adenosine deaminase, inosine nucleosidase, and adenosine nucleosidase are enzymes that break down the nucleosides adenosine and inosine. To understand the mechanism by which each of these enzymes operate, they are being purified from germinated Alaska pea and corn seeds. Four days after germination an initial extract was prepared by grinding the seeds in 50 mM Tris pH 7.2 buffer. After an initial purification step consisting of ammonium sulfate precipitation, the enzyme-containing solution was subjected to ion exchange chromatography on a DEAE Sephadex column. The activity and protein content of the fractions collected were determined and fractions containing active enzyme were pooled. Additional chromatography was carried out using size exclusion, aminohexyl, and hydrophobic interaction to further purify the enzyme. After each step, the fractions were assayed for protein and activity. Fractions containing active enzymes were pooled and subjected to additional chromatography. The purities of pooled fractions were determined by sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE).

UG48

PUBLIC DEBT AND INCOME INEQUALITY

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A recent study by Stefania Albanesi (2007) documents the direct link between voter preferences and central government inflation policy. There, the poor don't want inflation and thus vote accordingly. As inflation has ebbed and central government debt reaches unprecedented levels, a question arises: is the changing mix of fiscal and monetary revenue policies a direct result of a shift in the political power of the poor? To answer this question, I investigate the link between the political power of the poor and debt policies. Data was gathered from the Organisation for Economic Co-operation and Development and examined for this purpose. Using the data combined with examinations of economic theory, the results appear to defend my hypothesis that the answer is yes, that redistribution policies in place to combat income inequality are a direct cause of some level of accumulation of debt. From that, we can conclude that the changes in fiscal and monetary revenue policies are, in fact, at least in some part a direct result of an increase in the political power of the poor.

UG49

ANALYSIS OF MUTANTS OF NUCLEOSIDE HYDROLASE FROM *ESCHERICHIA COLI*

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Chemistry

Nucleoside hydrolase is a non-specific enzyme that catalyzes the hydrolysis of both purine and pyrimidine nucleosides in the turnover of nucleic acids. The enzyme is of critical importance in parasitic protozoans and has been studied extensively. Multiple forms of the enzyme are also present in *Escherichia coli* (*E. coli*) although much less is known about these enzymes. A recombinant form of the *E. coli* enzyme (rihC) has been cloned and a number of mutants have been prepared in which selected amino acids have been changed to determine the importance of these amino acids in the functioning of the enzyme. The original enzyme (wild-type) and the mutants have been purified by Ni resin affinity chromatography and the purity of the enzymes determined by SDS-polyacrylamide gel electrophoresis. The Michaelis constant, which is a measure of the ability of a substrate to bind to an enzyme, was determined for uridine using the wild type and also mutated enzymes. The mutants prepared include changing the histidine at position 233, aspartic acid at position 234, arginine at position 222, and phenylalanine at position 164. Based on the effect each of these mutants have upon the activity of the enzyme, a mechanism for the enzyme-catalyzed reaction will be proposed.

UG50

THE NOVELTY EFFECT AND MAGIC

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Economics

Magic the Gathering is a card game developed in 1993 by Richard Garfield and produced by Wizards of the Coast. The game pits two players acting as wizards to build resources to summon spells and monsters to damage their opponents. The popularity of the game has increased substantially since its inception and currently has over ten million players worldwide. A secondary market has evolved over the years that allow players to amass collections worth thousands of dollars. Experts within the Magic community have been working at theorizing and solving the complexities of this secondary market to increase personal wealth or to obtain cards at minimal costs.

The novelty effect is an economic force which causes goods to have artificially inflated prices when first entering a market. In Magic, some cards tend to have inflated initial prices but over time decline to a more stable market value. It can be hypothesized that the decline is merely the forces of supply and demand at work on the open market. If this were true, we would expect all new cards to exhibit this behavior. In reality, some cards actually increase in value over time. This increase in value is hypothesized to be the novelty effect. The purpose of this research is two-fold. First, determine a way to derive the duration of the novelty effect on a card. Secondly, see if there are any contributing factors that can help predict the duration of the effect. By doing so, an agent in this market may be able to speculate on future cards to earn a modest financial gain.

UG51

DEVELOPING A TEST METHOD FOR DETERMINATION OF VOID SPACE ON THE SURFACE OF ROLLER COMPACTED CONCRETE SPECIMENS

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Concrete Industry Management

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Concrete Industry Management

Historically the major application of roller compacted concrete (RCC) has been in heavy civil projects (dams, dikes, etc.) where the surface characteristics have held little importance. In the recent past RCC is has been used to a greater extent for pavements. The aesthetics of the surface for pavements for parking areas and roads can be a negative issue when comparing to asphalt and conventional concrete pavements. Currently the only way to evaluate the surface characteristics of different mixtures is very limited. A highly experienced individual who has themselves worked with and evaluated a number of different concrete mixtures in the past could conceivably tell the difference of fresh concrete mixtures by touch or visual inspection. The other way is trial-and-error method with different mixtures in full scale production and placement with the paving equipment. These methods can be at times impossible, unreliable, expensive, and time consuming. A laboratory method will not necessarily be able to replace all trials of placement with the paving equipment in question, but it could reduce the number of trials by being able to start with a mixture at a much closer point to ideal surface characteristics. With increased use of RCC in pavements more and more ready mix concrete producers will be supplying concrete. The proposed method could help speed up the development time for mixture designs while producing better mixtures for inexperienced concrete suppliers and new RCC markets.

UG52

EXAMINING THE RELATIONSHIP BETWEEN INTIMATE PARTNER VIOLENCE AND RAPE AMONG TENNESSEE'S MALE AND FEMALE ADOLESCENTS

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Health and Human Performance

Andrew Owusu, Ph.D. (Associate Professor)
Health and Human Performance

Purpose: Existing studies indicate that forms of intimate partner violence (IPV) including physical forms may end in rape. However, most research into IPV focus on its prevalence or incidence among adult perpetrators and/or victims. This study assessed the relationship between IPV and rape status among high school students in Tennessee.

Methods: Using data from the self-administered 2011 Tennessee Youth Risk Behavior Survey. The selected independent variable was IPV victimization. The dependent variable was rape.

Results: Odds ratios were calculated for cross-tabulations. Students who have reported IPV are significantly more likely (OR 7.764 [7.6, 7.935]) to report rape than those who have not been reported IPV. However, male students (OR 20.000; [9.26, 43.256]) who were raped were significantly more likely than females (OR 4.926 [3.54, 6.863]) to report being a victim of IPV.

Conclusions: Those that were victims of IPV are significantly more likely to report that they have been victims of rape as well; therefore, students who report being raped are more likely to report IPV. The results suggest that when developing a program to help IPV victims, program planners should consider the likelihood of IPV victims having experienced rape.

UG53

EXPLORING PREHISTORIC GASTROPOD USE ALONG THE MIDDLE CUMBERLAND RIVER

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Shellfish played an important role in ancient life in the Southeastern United States. Much attention has been given to coastal shell mound and midden sites, as well as select interior freshwater middens. Few studies have focused explicitly on the analysis and interpretation of freshwater gastropods and the data they provide about past lifeways. We examine freshwater gastropods from two prehistoric sites located along the Cumberland River in Middle Tennessee that were occupied during the Archaic through Mississippian periods. Our goal is to compare differential use of these taxa both spatially and temporally. We use metric data recorded from two species and one family of gastropods for comparative purposes. These data allow us to draw conclusions about site function, subsistence, and paleoenvironments, and formulate hypotheses to be tested with further sampling.

UG54

SYNTHESIS OF CYCLOPROPYL PEPTIDOMIMETICS AS POTENTIAL BACE AND HIV PROTEASE INHIBITORS

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Chemistry

The utility of peptidomimetics as enzyme inhibitors is well documented in the pharmaceutical field. HIV protease inhibitors have been particularly successful, with ten marketed peptidomimetics. Peptidomimetics are also in development as inhibitors of beta-secretase (BACE) for the treatment of Alzheimer's disease. However, relatively few syntheses of semi-rigid cyclopropyl analogs have been reported. A three-step synthesis of a core cyclopropyl-containing peptidomimetic has been developed in our laboratory: Grignard addition to amino acid Weinreb amides provides enones that are substrates for the cyclopropanation. Extension of the core cyclopropyl products to provide compounds that may be expected to have activity as either BACE inhibitors or HIV protease inhibitors will be presented here.

UG55

AN EXAMINATION OF THE RELATIONSHIP BETWEEN OVERWEIGHT/OBESE BMI STATUS AND PHYSICAL ACTIVITY AMONG TENNESSEE ADOLESCENTS

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Health and Human Performance

Andrew Owusu (Faculty)
Health and Human Performance

Purpose: Studies indicate that healthy lifestyle habits such as physical activity can lower the risk of overweight/obesity. This study assessed the relationship between overweight/obese and physical activity among adolescents in Tennessee. Based on these studies, we hypothesize that there is a relationship between adolescent overweight/obesity and physical activity. By increasing the amount of daily physical activity, the chances of adolescents being overweight/obese can be significantly decreased. Methods: Using data from the self-administered 2011 Tennessee Youth Risk Behavior Survey. Selected dependent variable was body mass index. Independent variables include number of days physically active, time spent watching TV, time spent playing video games and using a computer, and physical education class attendance. Results: Odds ratios were calculated for each cross tabulation. Adolescents who watch three or more hours of TV per day are significantly more likely to be overweight /obese than adolescents who watch less than three hours of TV per day (OR= 1.465 [1.10-1.945]). Adolescents who engage in five or more days per week are equally likely to be overweight/obese as those who do not. Adolescents who spend more than three hours per day playing video games or on the computer are equally likely to be overweight/obese as those who do not. Those who attend physical education class at least once a week compared are equally likely to be overweight/obese as those who do not. Conclusions: According to our results, only time spent watching TV showed a significant relationship when cross tabulated with overweight/obese adolescents. We were surprised at the lack of relationship between these variables. Reasons for these findings include factors affecting BMI and differences between genders. However, additional research is needed to discover why insignificant relationships were found between overweight/obese adolescents and physical activity.

UG56

“RETAIL THERAPY” NEEDS THERAPY

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Human Sciences

The purpose of this research has three objectives. The first objective is to explore the pre-shopping and post-shopping psychological and emotional state of shopaholics. This exploration will raise questions such as “Are these shopaholics victims of Impulsive-compulsive buying disorder (ICBD), depression, or emotional distress? Following this investigation, long-term effects of the addictive behavior will be evaluated. Do long-term effects include financial turmoil, insufficient financial responsibility, and/or hindrances to one’s life progressions? Last but not least, the third objective is to determine if fashion professionals should contribute to an effort to restore healing to shopaholics and teach financial responsibility and wise shopping habits. The methodology was a collection and review of personal accounts of shopaholics, a comparison to clinical studies, and a survey of one hundred and fifty people. The results identified that shopaholics are silently suffering from impulsive-compulsive buying disorder. A solution is offered to help consumers be responsible, liable, and healthy citizens. If consumers are healthy in their minds and emotions, which affects their ability to consume goods and services, then the marketplace will be richer and more fulfilling.

UG57

DEVELOPMENT OF A DISACCHARIDE IDENTIFICATION EXPERIMENT FOR THE BIOCHEMICAL TEACHING LABORATORY

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Chemistry

Experience in the laboratory is central to the education of every biochemist and chemist. However laboratory teaching experiments operate under several constraints. The most important constraint is that the experiment illustrate an important technique or principle. Almost as important are the time restrictions that are placed upon the experiment. One such experiment involves the identification of an unknown disaccharide. To fully identify a disaccharide three factors must be known: identity of the monosaccharides present, orientation of glycosidic bond (either α or β) and the atoms involved in the glycosidic bond. Information about the atoms involved can be gleaned by subjecting the unknown disaccharide to Benedict's test. The specificity of enzymes can be exploited to determine whether the glycosidic bond is α or β . Because of their structural similarity, the most difficult part of this problem is to identify the monosaccharides involved. A method using a specialized carbohydrate column attached to a Dionex 3000 HPLC was developed to separate the monosaccharides, glucose, galactose, and fructose, from each other. Combining the results from all three techniques allows the biochemistry student to identify an unknown monosaccharide in a single laboratory period. This experiment will be used by students in the Biochemistry laboratory.

UG58

WOMEN AND SCIENCE: THE BIO PROJECT

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Chemistry

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Sociology

Angel Talamantes
Psychology

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Honors, Chemistry

Women's place in science has been overshadowed and at times deliberately concealed by the focus on the male power structure. Women are not widely represented or recognized for their many contributions in non-traditional fields such as science and math. If not for curious women carving their own path in the science community, some of the greatest discoveries would still be yet to be discovered. They have worked just as hard, if not harder to help bring further knowledge to the scientific world. Yet, women are still fighting for their place in STEM today. More work is still to be done as women remain underrepresented in many STEM fields. Positive role models can likely be an influence on the career choices of women and girls. However, possibly due to a more conservative culture, the history of women in science in the south is especially silent. In an effort to promote women role models in STEM from the south, as well as shine light on the amazing contributions of women to STEM over the years, we have created The Bio Project. For this project, we have researched the lives of Tennessee women in STEM. These women have swum against the stream to further create a path for women's participation in the sciences. They have been able to fight the discrimination and balance their family and working lives, while helping make great strides in the name of science.

UG59

THE EFFECTS OF MATERNALLY TRANSFERRED METHYLMERCURY ON LEUKOCYTE DIFFERENTIALS IN NORTHERN WATER SNAKE (*NERODIA SIPEDON*) NEONATES

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Cassandra Henry (Undergraduate)

Vincent Cobb, Matthew Klukowski, Frank Bailey (Faculty))
Biology

Vincent Cobb (Faculty Sponsor)
Biology

The ability to mount a response to stress is essential to the survival of any organism. Although the effects of mercury on stress in vertebrates have been well documented, little research in this area has been done on reptiles. Mercury is a common contaminant in aquatic systems, and tends to accumulate in predators at the top of the food chain, like the Northern Water Snake (*Nerodia sipedon*). It is known that stress influences leukocyte ratios in vertebrates, and fluctuations in these ratios can be used to assess stress levels. This study examines the effects of maternally transferred methylmercury on stress in *N. sipedon* neonates using leukocyte ratios, and additionally provides baseline leukocyte parameters for *N. sipedon* neonates, which have not been previously reported. 18 gravid females were collected at Lake Erie and dosed in the laboratory at Middle Tennessee State University with one of three concentrations of methylmercury (0, .01, and 10 μ g/g body mass.) After birth, peripheral blood samples were taken from 10 neonates from each litter and smears were prepared using a Giemsa stain. The smears were analyzed using a light microscope, and leukocyte differentials were recorded for each neonate. Preliminary results suggest no significant difference in leukocyte parameters between mercury doses; however, an inverse relationship was discovered between basophil and lymphocyte ($r = -.7869$, $p = 0.002$) as well as heterophil and lymphocyte ($r = -0.5847$, $p = 0.046$) numbers in neonates.

UG60

USING THE CAMOEBIANS AS INDICATORS OF ENVIRONMENTAL CHANGE WITHIN TODDS LAKE, MURFREESBORO, TENNESSEE

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Geosciences

The Stones River watershed is located in Rutherford County, Tennessee and is the source of the city of Murfreesboro's drinking water. Rutherford County has grown 44% in the last decade with the population of Murfreesboro increasing by 40,000 in the same time period. This growth rate is considered to be one of the highest in the nation and the watershed is considered to be impacted due to urban growth. Black Fox Spring, which begins in a Tennessee Wildlife Resources Agency protected wetland, travels through several subdivisions and receives runoff from lawns and driveways. It ends at Todds Lake in Murfreesboro. This lake was originally a wetland and after two dams were built it is now an artificial lake and reservoir for Murfreesboro. Todds Lake is also located near a subdivision, a strip mall, and a gas station, and could possibly be receiving runoff from those areas. Thecamoebians, microscopic invertebrates, can be used to study the water quality of an area with little or no disturbance to the area. Thecamoebians are benthic, living at or near the bottom of a body of water. This allows them to give a good indication of the conditions at the bottom of a freshwater environment. Thecamoebians are also very sensitive to changes in the environment and they have been used as pollution indicators in studies in North America and Europe. The shells of these organisms preserve easily, and they can be used to study ecological changes in the fossil record going back decades to centuries. Sediment samples have been collected from Todds Lake and seven species and nineteen strains of thecamoebians were identified. The assemblage of thecamoebians includes *Centropyxis aculeata* and *Arcella vulgaris*, which are indicators of stressed environments, and several species of *Diffugia*, which thrive in eutrophic conditions.

UG61

ANALYSIS AND FERMENTATION OF THE SUGARS DERIVED FROM KENAF PULP

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Chemistry

This study evaluates the possibility of converting the sugar precursors derived from cellulase digestion of kenaf pulp into bioethanol. In order to convert the crystalline cellulosic form to the amorphous form amenable for enzymatic hydrolysis of the glycosidic bond, kenaf pulp samples were subjected to at base pre-treatment processes. A microwave-assisted pre-treatment with 5% sodium hydroxide at 50 °C that resulted in a high glucose yield from the digestion of pre-treated fibers with cellulase from *Trichoderma reesei* was selected. Raman microscopy was used to study structural changes of the kenaf fibers after the pre-treatment process as well as after the cellulase digestion. The resulting sugar samples from the enzymatic digestion were analyzed using a selective HPLC carbohydrate column. The kenaf sugar composition and relative quantity were then compared with existing data from the literature. Yeast strains, including K1-V1116-YEBrL4 and K1-V1116-MGEt2, that are tolerant to high ethanol levels were used to ferment the glucose obtained from kenaf. Formation of ethanol indicated that these strains were not inhibited by the presence of residual phenolic byproducts from the lignocellulosic digestion of kenaf pulp.

UG62

RIGHT CHOICES: MTSU'S FAMILY AND CONSUMER SCIENCES EDUCATION PRE-SERVICE TEACHERS ASSIST IN TEACHING LEADERSHIP SKILLS AT PATTERSON PARK COMMUNITY CENTER

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Human Sciences

Mary Morrison (Undergraduate)
Psychology

Sandra Poirier (Faculty Sponsor)
Human Sciences

Informed decisions by adolescences are an outcome of youth receiving appropriate modeling, increased academic assistance, and provisions of guidance in career choices. A synonym for “informed” is the term “right”. “Right” is a powerful adjective defining the objective of the Patterson Park Community Center (PPCC), to offer youth an afterschool program entitled “Right Choices”. Patterson Park Community Center of the Murfreesboro Parks and Recreation have collaborated with Middle Tennessee State University’s (MTSU) Family and Consumer Sciences Education program to promote social, emotional and academic needs of youth. Examples of instruction taught by MTSU’s Family and Consumer Sciences Education pre-service teachers include: building personal skills, social competencies, managing emotions, improving peer relations, strengthening family relations, improving communication skills and healthy living. Pre-evaluations and post-evaluations were administered by the pre-service teachers to evaluate the student’s learning. Results indicated that most students had increased their knowledge in regards to the lessons taught. Research also supports the positive benefits of tutoring adolescences, by using one-on-one intervention, counseling and an introduction to a variety of academic curriculum. The pre-service teachers receive valuable “on the job” training through lesson planning, creation of class activities and educational presentations. The need for such an afterschool program is evidenced by the years of continued participation by all partners. Positive evaluations from participants in the “Right Choice” program, as well as their guardians, pre-service teachers and supervisors provide evidence that this type of program is a decision that is right for teens, the community, and MTSU.

UG63

ACID SPHINGOMYELINASE INVOLVEMENT IN CHOLESTEROL DEPENDENT DIFFERENTIATION OF N2A NEUROBLASTOMA CELLS

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Biology

Neuroblastoma is a common malignant tumor that develops from nervous tissue and is most prevalent in children under five years of age. The importance of studies involving Neuroblastoma, lies in the ability of the tumor to spontaneously regress. This regression appears to be caused by differentiation. Previous work has shown that blocking the isoprenoid (cholesterol) synthesis pathway with mevillin triggers differentiation in murine (mouse) Neuroblastoma (N2a) cells. Restoration of the pathway prevents differentiation, which suggests that regulation of the cholesterol synthesis pathway may explain the ability of N2a to spontaneously regress. It has also been shown in previous studies that N2a have low levels of acid sphingomyelinase (aSMase) activity and ceramide production. This has been suggested as a cause of tumorigenesis in N2a because of ceramide's involvement in differentiation. Using a transfected cell line that expresses high levels of aSMase activity, the purpose of this experiment was to compare the rate of differentiation of the transfected clones (C) to the wild type (B) N2a cells. Preliminary data shows that there is a difference between the two cell lines in the amount of spontaneous differentiation and induced differentiation morphologically.

UG64

QUANTUM DOT SYNTHESIS

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Physics and Astronomy

Quantum dots are semiconductor nanocrystals whose excitons are confined in 3D space. Quantum confinement, as this phenomenon is known, carries with it the effect of a change in conducting characteristics when there is a change in size of the crystal. The purpose of this project was to find the best method for creating nanocrystals to be used in the construction of a nanocrystal sensitized solar cell. The method of high temperature oleic acid synthesis is widely used by many researchers to grow CdSe nanocrystals. Our goal was to vary the volume, stoichiometry, and reaction temperature of our synthesis to see if the process can be slowed down while still preserving the tight size distribution and structural integrity of the nanocrystals. Cadmium oxide, oleic acid, and octadecene were heated in a flask to 300 °C. We injected a 0.1M Se solution, and the solution began to change color (indicating nanocrystal formation). This process was carried out seven times, each time varying either the volume, ratio of reactants, or using a butanol “kill shot” to rapidly lower the temperature. The nanocrystals were precipitated out and stored in hexanes. Testing was done with a spectrophotometer and a spectrometer. Photoluminescence spectra and absorbance for each batch was measured to confirm size and the general distribution of sizes. A well-defined absorbance peak indicated a tight size distribution, which is desired for use in a solar cell. Our best results were from increasing the ratio of Cd to Se to 2:1, in which growth was completed in approximately one minute. The average size of the nanocrystals was about 3.04 nm. Future research will include an attempt to use electrophoretic deposition to deposit our nanocrystals on a substrate to be incorporated into a working solar cell.

UG65

SCENIC DESIGN FOR SWEENEY TODD: THE DEMON BARBER OF FLEET STREET

Casey Martin, (Undergraduate)
Speech and Theatre

Scott Boyd (Faculty Sponsor)
Speech and Theatre

This project is a theatrical scenic design for Steven Sondheim's Sweeney Todd: The Demon Barber of Fleet Street. My design is staged for Tucker Theatre at Middle Tennessee State University and was done under the faculty advisor, Scott Boyd. To accomplish this, I used the elements of design, line, color, shape, space, form, and texture, put in place in consideration with the principles of design: balance, unity, variety, harmony, movement, rhythm, and emphasis. In my process, I focused on the text to produce my design after fully comprehending and understanding its depth, content, and meaning. With theatre being an art form, and all art being subjective, this design visually represents my subjective interpretation of Sweeney Todd, thus creating an atmosphere full of emotion, meaning, and depth. In this spectacle I have created, the elements of design come together to further the viewers understanding of the sentiments that lay under the surface of the bitterly broken-down atmosphere that was 19th century London. Sweeney Todd depicts this realm of poverty stricken England with immense accuracy, as you shall see. Upon implementing this process, I created a design concept formatted to fit within the structural perimeters of Tucker Theatre.

UG66

SURVEY OF BACTERIAL CONTAMINATION IN READ-TO-EAT FOODS

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Molecular Biosciences

Rachel Patton (Undergraduate)
Biology

Anthony Newsome (Faculty Sponsor)
Biology

The convenience of ready-to-eat foods has made them a popular choice with consumers. However, recent outbreaks of food-borne illnesses have made many people concerned about the safety of these food products. To evaluate the contamination risks, a sampling of ready-to-eat foods was obtained from local retailers. These samples were tested for levels of bacterial contamination as well as for the presence of coliform bacteria and the common food-borne pathogens *Escherichia coli* and *Listeria monocytogenes*. Bacterial contamination was identified in greater than 90% of the samples tested. The results of this study have important implications for local consumers as well as those charged with maintaining and ensuring the safety of these products.

UG67

ALCOHOL, SEX AND CONDOM USE AMONG ADOLESCENTS IN TENNESSEE

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Health and Human Performance

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Health and Human Performance

Andrew Owusu (Faculty Sponsor)
Health and Human Performance

Introduction: According to the CDC teens ranging from 12 to 20 years of age drink 11% of all alcohol consumed in the United States. More than 90% of the alcohol is consumed in the form of binge drinks. Also in 2009 the CDC reported that many young people engage in sexual risk behaviors that can result in unintended health outcomes including sexually transmitted infections and unintended pregnancies. This study examines the relationship between alcohol use and unprotected sex among adolescents in Tennessee. Methods: Data from the 2011 Tennessee Youth Risk Behavior Survey was used to examine the relationship between alcohol use before last sexual intercourse and condom use during last sex act. The independent variable was alcohol use before last sexual encounter. The dependent variable was condom use during last sexual intercourse. Results: There was a significant relationship between alcohol use before last sexual intercourse and condom use during last sexual intercourse (OR 0.50; CI 0.38-0.64). Among students who used a condom during last act, those who consumed alcohol (45%; CI 37.2-54.2) were significantly less likely to report using a condom compared to those who did not use alcohol (62%; CI 57.3-67.6). Conclusion: The results indicate that effective STI and unintended pregnancy intervention programs should address the problem of alcohol use prior to sex.

UG68

BINDING TO MESOPOROUS SiO₂ FILMS AND SOLIDS OF BOVINE SERUM ALBUMIN

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MSPS Biotechnology

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Chemistry

Mesoporous silicates are reliably synthesized using established templated sol-gel procedures including thermal decomposition of the template. Here we report fluorescent protein binding to mesoporous SiO₂ films and solids and compare with binding at nonporous surfaces. Sol-gels containing polyether templates were allowed to dry into SiO₂ solids, coated on sponges, or spin-coated onto glass substrates. After calcining to remove the polyether and scaffolding material, the mesoporous silicates were treated with 3-aminopropyl triethoxysilane to provide reactive sites. The delicate sponge-scaffolded solid was strengthened by including vinyl triethoxysilane at the sol-gel stage. Interfacial binding of FITC-labeled bovine serum albumin (BSA) protein occurred in specific regions where applied as a spot on the film surface. The concentration of labeled BSA protein was varied to find the fluorescence detection limit for binding to the mesoporous solid and porous and nonporous films. Cy5-labeled BSA recognized FITC-labeled anti-BSA on film surfaces.

UG69

COAXIAL CABLE METAMATERIAL BASED ON A SUB-WAVELENGTH LOADING BY INDUCTOR-CAPACITOR RESONATORS

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Biology

Deporschia Green (Undergraduate)
Engineering Technology

William Robertson (Faculty Sponsor)
Physics and Astronomy

A metamaterial has properties not found in nature derived from its structure, not its composition. Applications from these include slow light, super lenses, and cloaking. Because of the expense of these materials, it is important to study these properties in inexpensive systems. In this experiment, we recreate the effects of a metamaterial using an inexpensive coaxial system with lumped element inductor/capacitor resonators. Measurements were made using the oscilloscope by displaying the signal from two paths simultaneously, one with no resonators, and the other with five resonators. A frequency generator produced a sinusoidal electrical signal through both paths. Amplitude and period were found for each path over a sweep of frequencies. The phase difference was taken by measuring the time difference between the peaks of each path. The amplitude data showed a transmission dip, and the phase data showed a phase shift around the frequency of the lowest transmission. Both these are phenomenon found with metamaterials.

UG70

FROM THE GROUND UP: UNIVERSAL RESIDENTIAL DESIGN PROMOTING SUSTAINABILITY

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Erica Jenne, Kim Willis, Melissa Mills (Undergraduates)
Human Sciences/Interior Design

Sharon Coleman (Faculty)
Human Sciences/Interior Design

Janis Brickey (Faculty Sponsor)
Human Sciences/Interior Design

Increasing demands for sustainable aging-in-place residences were the impetus for a senior interior design team studio project. A simulated design of the Weaver residence located on a brown field reclamation in Lubbock, Texas, was a contemporary, 2,800 sq. ft. home that exemplifies the application of both universal and sustainable design principles. The Weaver residence is comprised of Joel Weaver, 61, his wife Cally, 59, and Cally's mother, Teresa, 84. Restrictions included a firm budget, integration of green products both in construction and finishes, accessibility, and a respectful interpretation of their native Cherokee heritage. The floor plan required individualized private spaces for its residents as well as additional space for visiting friends and family. In order to determine the optimal orientation of the home, sun studies were performed utilizing Google SketchUp. Twelve chosen summer and winter solstice dates were used to observe the sun's highest and lowest positions. Using this information, team members collaborated with students from the EST4820 Solar Building Design group to determine placement of overhangs, use and preservation of existing trees, location of solar panels, and window size and placement. Exterior walls consisted of Durisol blocks clad with wood, stone, and stucco. Alternative energy sources, solar panels, Live green roof systems, and geothermal heating/cooling, dramatically reduced the amount and cost of consumed energy. To assist Teresa and the couple planning to age in place, Universal design was incorporated throughout the home with four foot hallways, 36" doorways, accessible cabinetry, no step entry, limited corners by including angled walls and minimal 90 degree turns.

UG71

SIMULATING SUPERLUMINAL PULSES THROUGH METAMATERIALS USING TRANSMISSION-LINE MATRIX MODELING

Lauren Rigsby (Undergraduate)
URECA, Honors College, Physics and Astronomy

William Robertson (Faculty Sponsor)
Physics and Astronomy

Within the last decade, the development of metamaterials has taken center stage in the area of materials science. Many exotic structures have been produced in hopes of manipulating the properties of electromagnetic and acoustic waves. Even though intricate three-dimensional metamaterials dubbed “invisibility cloaks” currently monopolize the limelight, there is something to be said for two-dimensional designs, which could be very useful as circuit elements. Of particular interest are structures that can modify the speed of waves, creating slow waves and even faster-than-light pulses. We used transmission-line matrix software called MEFiSTo to model the propagation of electromagnetic waves through a waveguide coupled with a loop filter. Fourier and phase analysis revealed transmission dips corresponding with jumps in phase. These phase jumps indicate that this type of structure is an anomalously dispersive medium, which means that wave packets sent through it can be rearranged in such a way that they are shifted forward or backward, resulting in slow waves, negative group velocities, or superluminal pulses. Since a superluminal wave packet is made up of many ordinary waves, this phenomenon does not violate causality, and it is a good indicator of a metamaterial. Our next step will be to investigate variations on the loop filter with different levels of loss to manipulate the attenuation of electromagnetic waves.

UG72

COMPARISON OF METHODS FOR THE ANALYSIS OF BIODIESEL COMPOSITION

Duy Linh Nguyen (Undergraduate)
Chemistry

Jack Nowotarski (Undergraduate)
Chemistry

Beng Guat Ooi (Faculty Sponsor)
Chemistry

Ngee-Sing Chong (Faculty Sponsor)
Chemistry

Analytical instrumentation methods including Fourier Transform infrared spectrometry (FTIR), Raman spectrometry, gas chromatography-mass spectrometry (GC-MS), high performance liquid chromatography (HPLC), and nuclear magnetic resonance (NMR) were used to measure the concentrations of all constituents including the esters found in biodiesel. The pros and cons of each method in terms of sensitivity, selectivity, quantitative accuracy, analysis time, analysis cost per sample, and applicability to the widest range of analytes were considered. The biodiesel esters were synthesized from seed oils such as canola oil, vegetable oil, and castor oil by transesterification with methanol in the presence of various homogeneous and heterogeneous catalysts using microwave heating method. The synthesis was carried out by adjusting various experimental parameters such as the molar ratio of oil-to-methanol, weight percentage of catalyst, temperature, and reaction period. The ultimate goal of this project is develop a more efficient process for biodiesel production that circumvents the need for product washing to recover the biodiesel esters and to avoid the loss of catalyst via the use of heterogeneous catalysis.

UG73

CONSTRUCTING THE “ILLEGALS” ISSUE: NATIVE SOUTHERN RESPONSE TO REPRESENTATIONS OF IMMIGRATION IN THE AMERICAN SOUTH

Crystal VanDalsem (Undergraduate)
Anthropology

William Leggett
Anthropology

Accelerated rates of immigration to the new transnational South further complicate a space often defined by its racialized history. The response to this demographic change has been widely publicized and often recalls familiar refrains about the Southern racist; however, these responses cannot only be considered through one limited conception of the issue, as immigration brings a variety of concepts to the surface. Apart from the issue of race, conceptions of how the Southerner defines him/herself must be considered. This paper addresses the role of the media in constructing and informing the opinions of Murfreesboro residents experiencing anxiety about the purity of the South.

UG74

THE FACEBOOK FRAME

Michelle Israel (Undergraduate)
Journalism

Kenneth Blake (Faculty Sponsor)
Journalism

If a random individual were asked how he or she feels about a social media network such as Facebook, Twitter, or Tumblr, the feedback received may completely deviate from the feedback received from the next individual. The Facebook Frame is a research study analyzing the way primary news sources frame information about social media networks to the public.

Social media networks are now being used as a primary method of interaction among social circles as a means to keep in touch with one another. Although there are many positive aspects of social media networks, there are also major drawbacks. Those drawbacks could be as a result of an unfavorable experience that an individual may have encountered, or it could be due to negative information and coverage that he or she receives from news sources. The purpose of this research is to determine how primary news sources frame Facebook, and whether it evokes a favorable degree of belief in the individual who receives the information.

Framing in the field of communication has been characterized by equal degrees of conceptual obliqueness and operational inconsistency (in Bryant, J. & Oliver 2008 pp. 17). A frame is what unites information together to form a package that can influence its audience. This suggests that frames are the devices that build the associations between concepts; information in a news story can cement the link, but it relies on a frame to build the associations.

Journalists are subconsciously aware of this and engage in the process of framing their message so the audience receives the information in the way they would like it to be portrayed. This research the hypothesis will suggest that primary news sources in the form of print media such as newspapers, magazines, etc. frame Facebook in a way that evokes a negative connotation.

UG75

THE ROB ZOMBIE BRAND: COLLISION AT THE INTERSECTION OF CULTURAL BRANDING, FANDOM, AND IDENTITY

Marshall Taylor (Undergraduate)
URECA, Recording Industry

Paul Fischer (Faculty Sponsor)
Recording Industry

This project explores notions of authenticity and identity in the culture industry, using Douglas B. Holt's conception of the cultural branding model (CBM) as a platform for the systematic analysis of the authentic relationship between consumer and cultural producer. The "Rob Zombie Brand" is used as a case study. By developing and performing an identity myth and facilitating its application in fans' identity construction, the Rob Zombie Brand is viewed as an institution for what Karen Bettez-Halnon describes as a liminal cultural alternative to reality for fans and anti-commercialistic youth. The seven tenets of the cultural branding model are compacted into three sections: Ideology, Contradiction, and the Value of the Myth; Brand Symbolism and Halo Effect Synergy; and Truth-Seeking Activism and the Big Break. More broadly, by emphasizing the role of authenticity in cultural production, it is argued that Holt's conception of the cultural branding model offers a method for empirically studying how a cultural brand forges an authentic relationship with fans by creating and performing an identity myth. The project considers Rob Zombie's constructed image as an example of a cultural brand, the implications of which are extrapolated to the broader conception of cultural production and the symbiotic relationship between "consumer" and "cultural producer" in the entertainment industries.

UG76

DEMOCRATIC PARTICIPATION ON CAMPUS

Lauren Campbell (Undergraduate)
Political Science

Kaylene Gebert (Faculty Sponsor)
Honors College, Speech and Theatre

Background: The purpose of this proposal is an experiment to find out how student-administration relationships are developed and treated on campus in order to create relational organizing. Recently I have studied the theories of Deliberative Democracy and Community Benefits Agreement and I would like to explore the nature of democracy on campus by finding out what my colleagues are interested in changing on campus and how administration policy changes affect them directly. Ultimately, I would like to encourage civic engagement and participation in the democratic process on campus. Research: Recent statistics from the U.S. Census Bureau shows that only around sixty percent of citizens around the nation are registered to vote. Out of that sixty percent, only about forty percent of those registered actually vote. A survey done by the political science department last year showed that only around 14% of student vote in campus elections. Through academic collaboration with the MTSU Student Labor Action Party (SLAP) my aims will be to create cohesion within the student body, understand campus/student body apathy towards campus politics and encourage democratic participation and community mobilization. Conclusion: Resource mobilization theory suggests that people become active when they have access to resources they can use to create social change. Lay leadership empowers local citizens to operate without overhead authority and provide for a more egalitarian structure, thereby legitimizing individual ideologies and participation versus structures that discourage individual contribution and raise resistance to participation. Using a model of deliberative democracy, I will attempt to understand how these relationships can be evolved through methods of direct communication as well as encourage active participation and dialogue in civic engagement.

UG77

SYNTHESIS OF LABELED MEVALONOLACTONE

Norma Dunlap (Faculty Sponsor)
Honors College, Chemistry

David Antonelli (Undergraduate)
Honors College, Chemistry

Mevalonolactone is an early intermediate in steroid biosynthesis, and steroids are biomarkers in a number of organisms. Dinoflagellates in particular, produce an array of steroids, and their identification is useful in characterizing these organisms. Although some steroids can be identified by GC-MS techniques, the use of isotope-labeled analogs can be used to help to identify biosynthetic pathways active in the organisms. Access to mevalonolactone labeled on the methyl group would aid in the identification of the steroid biomarkers in dinoflagellates, however the only reported synthesis lacks reproducibility. Although there are a number of synthetic approaches to mevalonolactone reported in the literature, there are very few that are amenable to the synthesis of a methyl-labeled analog. A new approach to labeled mevalonolactone is reported here. Initial synthesis has been tested on the non-labeled material and synthesis of the labeled analog is in progress. Growth of dinoflagellates in the presence of the labeled material is expected to provide insight into the biosynthesis of steroids in the organism.

UG78

GROWTH TRENDS OF *OPUNTIA HUMIFUSA* IN A MIDDLE TENNESSEE CEDAR GLADE

Jarrod Shores (High School Student)

Anthony Farone (Faculty Sponsor)
Biology

In this study, the growing trends of the *Opuntia humifusa* in a cedar glade environment were surveyed. Since the cedar glades provide for little plant life, it was expected that the *O. humifusa* would be prominent in the cedar glade environment since cacti tend to thrive in areas that are marginally hospitable for plant life. After locating various *O. humifusa* populations in the glade area, data was collected in three specific categories- soil depth, soil texture, and canopy cover. These factors were considered important for determining growing trends in this particular species. Soil samples were taken at each cacti population sampled in the glade area. In addition, canopy cover was measured in percent by using a densitometer for each location. The results indicated that although soil depth was found to greatly differ between each sample site, canopy cover was consistently high at every sample site. Finally, soil texture tests were also consistent between the five sample sites. The data shows trends in canopy cover, which may be an important factor in determining where *O. humifusa* can grow in a cedar glade area. Although soil depth appeared to be insignificant further research with a larger sample size could reveal more specific trends in environmental conditions needed for *O. humifusa*.

UG79

SOIL COMPOSITION OF A TYPICAL CEDAR GLADE HABITAT IN MIDDLE TENNESSEE

Joseph Kennedy (High School Student)
Biology

Lauren Pearson (High School Student)
Biology

Amanda Sudberry (High School Student)
Biology

Christina Nicholas (High School Teacher)
Biology

Anthony Farone (Faculty Sponsor)
Biology

Cedar glades are rare ecosystems located in the southeastern United States. The shallow soil in conjunction with exposed limestone bedrock has shaped these ecosystems and led their species' to adapt to the unique living environment. The plants in the cedar glades have adapted to live in the shallow, rocky, and dry areas with low nutrient levels. The objective of this study was to compare the soil nutrients between the inner and outer zones of two glades at Flat Rock Cedar Glades and Barrens of Middle Tennessee. Soil depth, phosphorous, nitrogen, and potassium levels were measured for comparison between glades and zones within glades (inner and outer). The results of the soil tests showed consistently low levels of phosphorous and nitrogen for the inner zone of both glades. The outer zones also had consistently low nitrogen levels, but potassium and phosphorus levels were higher than those of the inner zones. These results supported our hypothesis that shallow soil would have lower nutrient levels than the surrounding forested areas.

UG80

THE EFFECTS OF CLADONIA RAGNIFERA AND NOSTOC COMMUNE ON PLANT GROWTH IN CEDAR GLADE ENVIRONMENTS

Ashley Hunt, Eric Jackson (High School Student)
Biology

Anthony Farone (Faculty Sponsor)
Biology

A cedar glade is an endangered ecosystem which is found in the central eastern United States area. Many cedar glades are composed of exposed limestone bedrock and have shallow soil, limiting the amount of plant life that can grow. In this study, *Cladonia ragnifera*, a lichen, and *Nostoc commune*, a cyanobacteria, were examined in evaluating for their efficiency as nitrogen fixers in the cedar glade environment. A model of the glade habitat was created for each plant and control groups. Replicates of a control, *N. commune*, and *C. ragnifera* were created using materials closest to the natural environment of the cedar glade where the specimens were collected. In each model, basil and dill were planted in soil collected directly from respective plant communities and the rate of emergence from soil and percentage of seeds that germinated were measured in assessing the lichens and cyanobacteria's ability to facilitate growth. Each model was then tested for soil nitrogen, phosphorus, and potassium levels. In the lichen replicates, the seed emergence rate was forty three percent with most of the soil nutrient results exhibiting inconsistent results. The cyanobacteria replicates had a twenty percent seed emergence rate with consistently low nitrogen and high potassium. The cyanobacteria replicates were very similar to the control replicates in soil nutrient composition but almost tripled the control's seed emergence rate. This study showed consistently low nitrogen soil levels in all of the models, while potassium and phosphorus were inconsistent. Seed emergence rate, however, suggests that plant communities with lichens provided an enhanced environment for the plant growth.

UG81

PLANT AND MICROBIOLOGICAL CRUST COMPOSITION IN A CEDAR GLADE COMMUNITY

Victoria Cooley (High School Student)
Biology

Joseph Flaherty (High School Student)
Biology

Samuel Stockard (High School Student)
Biology

Christina Nicholas (High School Teacher)
Biology

Anthony Farone (Faculty Sponsor)
Biology

Microbiotic crusts are highly specialized communities of cyanobacteria, mosses, and lichens that are most commonly found in semiarid to arid environments. By conducting biological surveys of plant communities in the cedar glades of Middle Tennessee, the microbiotic crusts, plant, and soil ratios are examined in evaluating glade structure and potential correlations with disturbance. In order to assess the microbial crust and plant community of the glade, random sites were selected in an open glade area and evaluated for biotic ground cover. Four foot by four foot plots were examined using a measuring square to assess the biotic life for each random site. Results showed the total biotic cover accounted for approximately twenty eight percent of the ground cover with a majority of the biotic ground cover composed of various plant species. Plant growth was positively correlated with microbial crust cover suggesting microbial crusts play a vital role in plants ability to inhabit the open glade area.

*UG82

COMPUTER SCIENCE EMBEDDED IN AEROSPACE

Justice Amankwah (Undergraduate)
Aerospace

Paul Craig (Faculty Sponsor)
Aerospace

In this research project, the Ramp Tower Coordinator helped design the Flight Operation Center Unified Simulation (FOCUS Lab). This research was a NASA-funded collaborative project in the Aerospace Department at the Middle Tennessee State University. This Focus Lab replicates all of an airline's flight operations center including; Flight Operations Coordinator, Flight Operation-Data, Ramp Tower Coordinator, Maintenance Control, Maintenance Planning and Scheduling, Weather and Forecasting and Pilot Crew. The Ramp Tower Coordinator is responsible for all Ramp Tower Operations. The Coordinator trains students to electronically push back the airplanes. Moreover, the coordinator helps students to electronically Taxi the incoming airplanes to the concourse gates. All scenarios take place at the Ramp Tower. The coordinator changes scenarios at any time to stimulate the thinking of students. The coordinator also places huge emphasis on information sharing to ensure that students can make good and more strategic decisions. The ability for solving aviation problems is what drives the Focus Lab. This elaborate simulation allows students to function as the operational controllers in their various stations. Students will operate this virtual airline for roughly three hours.

* UG83

SCENIC DESIGN FOR SWEENEY TODD: THE DEMON BARBER OF FLEET STREET

Casey Martin, (Undergraduate)
Speech and Theatre

Scott Boyd (Faculty Sponsor)
Speech and Theatre

This project is a theatrical scenic design for Steven Sondheim's Sweeney Todd: The Demon Barber of Fleet Street. My design is staged for Tucker Theatre at Middle Tennessee State University and was done under the faculty advisor, Scott Boyd. To accomplish this, I used the elements of design, line, color, shape, space, form, and texture, put in place in consideration with the principles of design: balance, unity, variety, harmony, movement, rhythm, and emphasis. In my process, I focused on the text to produce my design after fully comprehending and understanding its depth, content, and meaning. With theatre being an art form, and all art being subjective, this design visually represents my subjective interpretation of Sweeney Todd, thus creating an atmosphere full of emotion, meaning, and depth. In this spectacle I have created, the elements of design come together to further the viewers understanding of the sentiments that lay under the surface of the bitterly broken-down atmosphere that was 19th century London. Sweeney Todd depicts this realm of poverty stricken England with immense accuracy, as you shall see. Upon implementing this process, I created a design concept formatted to fit within the structural perimeters of Tucker Theatre.

*UG84

EFFECTS OF RUNNING ECONOMY: BAREFOOT VS. VIBRAM TRAINING

Brad Hornback (Undergraduate)
Health and Human Performance

Tucker Cole (Undergraduate)
Health and Human Performance

Stephen Meredith (Undergraduate)
Health and Human Performance

Paige Fuson (Undergraduate)
Health and Human Performance

Zach Willis (Undergraduate)
Health and Human Performance

John Coons (Faculty Sponsor)
Health and Human Performance

Running economy can be looked at as how far an individual can run expending a certain amount of energy. There are a few different factors that can affect running economy, such as, stride length, air resistance, and shoe weight. The factor we are studying in our research is shoe weight. Our participants used Vibram FiveFinger shoes, thought to be light enough to mimic barefoot running, but our study investigates whether the weight of the Vibrams is small enough to equal the running economy of barefoot runners. Will barefoot running be necessary? Can Vibram training ensure the same promising benefits as barefoot training, while protecting the feet in the process?

*UG85

PUBLIC SOMEBODIES/ PLACES OF REFUGE: PHOTOGRAPHS OF NASHVILLE'S LOWER BROADWAY

Bradley Marshall (Undergraduate)
Photography

Shannon Randol
Photography

I have spent the past year photographing on lower Broadway in Nashville, at night with a flash. This location is ideal for observing relationships between social interactions such as gender, identity, isolation, and religion. These interactions serve as a jumping-off point for making photographs that compare the discordant relationships between the preconceived traditions of the south and the impacts of a city in the midst of expansion. These photographs observe the public spaces of urban broadway being occupied in ways that are surprisingly intimate, grotesque, and sometimes serendipitous compared to other parts of Nashville as well as the Southern experience alike.

*UG86

SAFE HAVEN LAW PSA

Jordan Boom (Undergraduate)
Electronic Media Production

Zach Clenney (Undergraduate)
Electronic Media Production

Daniel Lawrence (Undergraduate)
Electronic Media Production

Mary Nichols (Faculty Sponsor)
Electronic Media Production

Jordan Boom directed the Safe Haven Law PSA for the Fall 2011 Single-Cam class. The purpose of the PSA is to creatively express the awareness of the Tennessee state Safe Haven law.

*UG87

OPERATION CONSOLIDATION: FILE AND PERSONNEL MANAGEMENT WEB APPLICATION

Keith Stewart, (Undergraduate)
Computer Information Systems

Melinda Korzaan (Faculty)
Computer Information Systems

The Army ROTC program at MTSU conducts a plethora of exercises that are organized by and for the cadets. The Operation Consolidation Web Application addresses the need for a system to organize the operation orders, along with their supporting files, into one easy to access web application. Along with the capability for cadets to upload their operations to the website, there is also the ability for upperclassmen and cadre to manage all the personnel information in the program. In addition, this application implements multiple levels of security, allowing cadets the highest level of access with permission to update information throughout the website. This allows for faster communication, accountability and an efficient way for cadets to take ownership of their program. The application was made using Visual Studio 2010 C#, SQL 2008 and is currently hosted on a web server running IIS and SQL 2008. Some highlights of the application are the abilities to upload/download files, update the website with the editor and uses custom authentication for security by pulling its users from the database. The application will be running on a laptop computer and will have a poster displaying some of the project management documentation, a small book that contains step by step instructions will be included along with all of the project management documentation.

*UG88

MEDEA: AN EMOTIONAL SPIRAL

Shay Gilbert, (Undergraduate)

Theater

Virginia Donnell (Faculty)

Theater 3050

Euripides' Medea will be presented as a deterioration of her psychological state of mind through theatrical design. The overall concept for the stage design portrays her imaged reality. The world reflected is not what is actually happening, but reflects what Medea feels is happening to her. In the dark recesses of her mind, Medea knows that everything is falling apart all around her but she is being pushed by forces outside her control to commit ever egregious and heinous acts. In the final scene, Medea is realized in a devastated, apocalyptic wasteland with a spiraling staircase narrowing to the sky. As Medea commits her murderous acts, her mind stays in a hellish realm where only evil exists, and she rises to the peak of destruction. As a final act of evil, Medea murders her children and disappears at the top of the smoldering spiral. This poster presentation is a hypothetical project from THEA 3050 Theatrical design Concepts.

*UG89

A DISCOURSE ON THE CLASHING OF GENDER PERFORMANCE ACROSS VARIOUS EASTERN AND WESTERN CULTURES: A LITERATURE REVIEW

Laurence Tumpag (Undergraduate)
McNair, Sociology

Jackie Eller (Faculty Sponsor)
Sociology and Anthropology

The purpose of this research is to present a discourse on the meaning of gender as defined by western (European & North American) and eastern (insular Southeast Asian) constructs with emphasis on religion. While gender in the west can be described as being dichotomous, insular Southeast Asia (Philippines, Indonesia, and Malaysia) has traditionally held a more pluralist approach to gender. As a historical framework, I will discuss the position of womanhood and highlight the performance of “transgender ritual specialists” within both regions. Next, I will discuss western colonialism’s re-imaging of gender within the Insular Southeast Asian region into a more western lens. Today, transgender performance in insular Southeast Asia seems to have lost its characteristics qualities of religion and spirituality and become more secular and associated with deviant behavior. Nevertheless, as gender is clearly shown to be a fluid concept, the west is itself re-evaluating its prior prescriptions and assigning a more gender-variant model in contemporary times. In turn, this is again refashioning notions of gender in insular Southeast Asia. I hope to widen the door for future discourses on the standing of non-dichotomous and non-hegemonic gender performance across both eastern and western spaces. In essence, I hope to bring a more holistic understanding to gender with the ultimate means of uplifting these marginalized peoples across both societies.

*UG90

KINEMATICS OF A PROJECTILE PAINTBALL

Jonathon James (Undergraduate)
Engineering Technology

Andrey Ogorodnik (Undergraduate)
Engineering Technology

Collin Szklarski (Undergraduate)
Engineering Technology

Sid Sridhara (Faculty Sponsor)
Engineering Technology

In our project, we will have four paintball guns of varying velocities between 200 and 350 ft/s in increments of 50 ft/s. We will be firing the paintball guns towards a wall that we are a set distance away from, and will be measuring the height that the paintball hits the wall. The paintball guns will be positioned into a mechanism we have built that will allow for precise firing. We will then use the kinematic equations to find out the distance the paintball would travel at each velocity if it were allowed to keep traveling, the velocity of the paintball when it hits the wall, and the time it takes to travel of the set distance. We will also fire each paintball gun from angles varying from 0 to 45 degrees in increments of 15 degrees. We will then record the same data as before and use the same kinematic equation to find the previously stated unknown quantities. In order to make sure that our collected data is more accurate we will fire each gun at least 10 times from each angle and take an average of the collected heights. We know that mathematically angles equal distance from 0 and 45 degrees should shoot the same distance; for example 15 and 60 degrees should mathematically shoot the same distance, therefore for our experiment from 0 to 45 degrees will be adequate for our experiment.

*UG91

MAME RESIDENCE: A CONCEPTUAL INTERPRETATION

Marcelene Rice, Undergraduate
Human Sciences-IDES

Deborah Belcher (Faculty Sponsor)
Human Sciences

This project involves a design concept for Auntie Mame, based upon a historic style. Information was gathered after watching the 1958 version of the movie, Auntie Mame. Analysis and evaluation of project parameters assisted with the creative endeavor. The 2012 residential renovation of the Mame home located in Manhattan, New York transforms the eclectic styles of the foyer, living room, and stairwell into a warm and inviting blend of the traditional furnishings of the Georgian Revival style, a subgenre of Colonial Revival. The triad color scheme of red, gold, and blue, used in the fabrics of the draperies, upholstery, and rugs provide a time-honored sense of historical accuracy that is appropriate to the neighborhood. Warm-toned neutrals in the painted woodwork and molding balance the high saturation of the red, gold, and blue hues. The brilliance of the brass finishes in the chandeliers, wall sconces, table lamps, and accessories contrasts against the wood grains of mahogany found in the hardwood flooring in the living room, grand staircase, and furniture. The foyer is dramatic in style with a curvilinear, grand staircase wrapped with a red oriental carpet runner. In the foyer the natural stone floor is warmed by a circular oriental rug, topped with a generous circular foyer table with a sunburst wood inlay that visually welcomes guests. The living room is filled with textures of silk, satin, velvet, and brocade upholstery in the camel back settee, Chippendale chairs, Queen Anne chairs, and window treatments.

*UG92

AUNTIE MAME: NEO-CLASSICAL REVIVAL

Victoria Throneberry (Undergraduate)
Human Sciences Interior Design

Deborah Belcher (Faculty Sponsor)
Human Sciences

This project involves a design concept for Auntie Mame based on a historic style. Information was gathered after watching the 1958 version of the movie Auntie Mame. Analysis and evaluation of project perimeters assisted with the creative endeavor. Auntie Mame's classical and ornately designed foyer, stairwell and living space entail a neutral palette with muted, pale blue accents. The solid fabrics and rustic flooring serve as a balance to the classical design with a twist of contemporary feel. The contemporary artwork is very natural and botanical and enhances the color scheme of neo-classical design. The space is lavishly decorated with materials, artwork and luscious fabrics.

*UG93

AUNTIE MAME RESIDENCE: USING HISTORY TO DESIGN FOR TODAY

Nicole Lynch (Undergraduate)
Human Sciences

Deborah Belcher (Faculty Sponsor)
Human Sciences

This project involves a design concept for Auntie Mame based on a historic style. Information was gathered after watching the 1958 version of the movie "Auntie Mame". Analysis and evaluation of project parameters assisted with the creative endeavor. The 2012 renovation of the Auntie Mame Dennis residence located at #3 Beekman Place in New York, New York reconstructed the 1930's foyer, stairwell, and living room into a mix of modern, moderne, and art deco style. The contemporary interpretations of the spaces are tied together through the monochromatic progression of blue-greens on the ceilings and geometric camel and black pattern wallpaper on the walls. In the entry hall, a Moderne lighting fixture has been placed and illuminates the tall glass floor sculptures which flank the sides of the entry door. Glass block columned sections on the stairwell wall are separated by chrome sconces. Below the stairwell, a black leather Nelson Marshmallow sofa has been set in place for additional seating. In the living room, the use of an achromatic color scheme is used on the light cream, crescent-shape leather sofa. The clean, sleek and polished space provides an environment suited for a modernist.

*UG94

AUNTIE MAME- GEORGIAN REVIVAL

Brittaney Ayers (Undergraduate)
Human Sciences-Interior Design

Deborah Belcher (Faculty Sponsor)
Human Sciences-Interior Design

This project involves a design concept for Mame Dennis based on a historic style. Information was gathered after watching the 1958 version of the movie "Auntie Mame". Analysis and evaluation of project parameters assisted with the creative endeavor.

The recent renovation of Mame Dennis' foyer, staircase, and living area in her New York City dwelling showcases a contemporary twist on the Georgian Revival style with the traditional elements of crown and dado molding, wood flooring, and line while hipping it up with a triadic color scheme of light blue, rich red, and gold. White accents play a large role through molding, decorative accessories, and a traditional Georgian Revival chandelier. The mix of solid, striped and textured fabrics, simplistic floor plan and less ornate furniture hold true to the historic value of the era while maintaining a fresh representation with the modern aspects. The two tone light blue horizontal stripes wrapping the entire room offset the simplistic characteristics of the camel back sofa and wing back chair serving as a strong statement of their own.

*UG95

AUNTIE MAME MODERNE

Kayla Walker (Undergraduate)
Human Sciences/Interior Design

Deborah Belcher (Faculty Sponsor)
Human Sciences

This project involves a design concept for Auntie Mame based on a historic style. Information was gathered after watching the 1958 version of the movie Auntie Mame. Analysis and evaluation of project perimeters assisted with the creative endeavor.

The Auntie Mame residence at Beekham Place in New York City, inspired by the Moderne style of the 1930s, was given a neutral color palette with splashes of blue seen in the furniture and accessories. Geometry and free forms are accented in the transitional lines and details of the furniture. The space is layered with dark ebony flooring which contrasts the neutral color scheme and the high ceilings. Geometric and curvilinear patterns can be found on the side chairs, pillows, and cut glass tables. The space flows through the furniture which adds to the simplistic walls and cubist inspired artwork.

*UG96

AUNTIE MAME DANISH MODERN

Haley Sims (Undergraduate)
Human Sciences

Deborah Belcher (Faculty Sponsor)
Human Sciences

This project involves a design concept for Auntie Mame based on a historic style. Information was gathered after watching the 1958 version of Auntie Mame. Analysis and evaluation of project parameters assisted with the creative endeavor. The 2012 living room, stairwell, and foyer renovation of Auntie Mame's residence in New York features a Danish Modern design. All three spaces have an achromatic color scheme with accents of orange and a combination of natural teak woods and brass elements. Wood has been used throughout the spaces in furniture, flooring, and accessories while brass has been used to give the spaces a more contemporary feel. Black naugahyde has been used on the tufted sofa and chair for a historical representation while glass-top tables lighten the spaces and reflect the orange accents. A unique orange fireplace was used to add warmth to the living room, and exotic plants have been added for an organic touch to the spaces. By using the same hardwood flooring throughout with neutral walls, the spaces become unified with a non-invasive background. The atmosphere for the spaces is inviting due to the warm orange accents.

*UG97

AUNTIE MAME: CONCEPTS AND INSPIRATIONS

Felicia Raines (Undergraduate)
Human Sciences

Deborah Belcher (Faculty Sponsor)
Human Sciences

This project involves a design concept for Auntie Mame based on a historic style. Information was gathered after watching the 1958 version of the movie Auntie Mame. Analysis and evaluation of project parameters assisted with the creative endeavor. The 2012 living room, foyer, and stairwell renovation of the Auntie Mame residence located in New York redesigned the furniture, color scheme and accessories into a contemporary interpretation of 1940's Danish Modern style. The achromatic color scheme of cream colored walls and sofa provide a fresh backdrop for the orange based wood tones of the furniture and accessories alongside the accents of crimson red, cast iron black and brass metallics. The funky curved lines of the armchair, wooden side chair, highboy, sculpture and other accessories pay homage to the whimsical Danish Modern characteristics while the narrow tapered legs of the furniture, thin vertical suspension lines of the staircase and star-burst clock represents its sobering attributes. The heavily woven sofa upholstery creates a soft visual texture that contrasts the smooth buttery texture of the leather armchair upholstery, which stays in tradition to the leather imitations often used in Danish Modern furniture. The egg shaped, freestanding fireplace adds warmth and energy of a New York apartment.

*UG98

NEOCLASSICAL REVIVAL

Megan Hale (Undergraduate)
Human Sciences-Interior Design

Deborah Belcher (Faculty Sponsor)
Human Sciences

This project involves a design concept for Auntie Mame based on a historic style. Information was gathered after watching the 1958 version of the movie Auntie Mame. Analysis and evaluation of project parameters assisted with the creative endeavor. The 2012 living room renovation of Auntie Mame's New York apartment was a twist on the Neoclassical Revival style. The color scheme was a monochromatic pallet of warm, light neutrals with pale blue accents. Sleek chairs and tables all had rectangular tapered that were true to the Neoclassical style. Greek sculptures and artwork of classical figures were the focal points in the space. Warm gray marble flooring in the foyer led into parquet wood flooring in the main living space. Three walls were painted a warm cream called ""Clay Bisque"", and the accent wall had vertically striped cream, tone-on-tone wallpaper that divided the room. The draperies were a soft brown that popped against the lighter cream wall. A side table lamp with a Greek key motif base and a drum shade carried the classical Greek feel throughout the space. A huge area rug over the hardwood floors had a pale blue and cream pattern that brought the accent color into the neutral room.

*UG99

NEO-CLASSICAL REVIVAL: HISTORIC PRECEDENCE FOR A DESIGN SOLUTION

Sara Vassar (Undergraduate)
Human Sciences- Interior Design

Deborah Belcher (Faculty Sponsor)
Human Sciences

This project involves a design concept for Auntie Mame based on a historic style. Information was gathered after watching the 1958 version of the movie Auntie Mame. Analysis and evaluation of project parameters assisted with the creative endeavor. The 2012 renovation of the Mame residence, located in New York, updated the foyer, stairway, and living room into a relaxing transitional space. The blue monochromatic color scheme with pops of green provides a light contrast to the dark wood tones in the parquet floor patterns. Stark white crown molding adds a traditional aspect to this transitional space. The glass and white stone coffee table and the white chandelier in the living room are two pieces that are contemporary interpretations of the Neo-Classical style. The white sofa and the light blue and white draperies are also contemporary interpretations. The variations of furniture styles between traditional and contemporary helps complete the modern interpretation of this Neo-Classical Revival inspiration.

*UG100

AUNTIE MAME DANISH MODERN RENOVATION

Lisa Wells (Undergraduate)
Human Sciences - Interior Design

Deborah Belcher (Faculty Sponsor)
Human Sciences

This project involves a design concept for Auntie Mame based on a historic style. Information was gathered after watching the 1958 version of the movie "Auntie Mame". Analysis and evaluation of project parameters assisted with the creative endeavor. The 2012 entry and living area renovation of the Auntie Mame Dennis residence located at #3 Beekman Place, Manhattan, New York restyled the foyer, living area, and stairwell using a curvilinear Danish Modern aesthetic. The color scheme was achromatic using moderate-value gray, black, and white with monochromatic yellow-orange accents. Light woods in the case pieces contributed to the monochromatic emphasis, along with Danish Modern designs using bent plywood. Mies van der Rohe's black leather Barcelona couch on the thick white rug created a focal point in the living area. It was flanked by white leather and chrome lounge chairs and ottomans by Charles Eames. Two Poul Kjaeholm PK20 chairs in black leather on spring steel bases, divided by a three-level wood circle table, created a private conversation area near the fireplace. The Charles and Ray Eames molded plywood folding screen provided a privacy backdrop between the entry and fireplace areas. Thin vertical lines in the white coat rack at the door provided a linear contrast to the curved, low seating. Accents of yellow-orange in the draperies and curved glass lamps popped against the achromatic furnishings.

*UG101

AUNTIE MAME DANISH MODERN INSPIRATION

Chloé Lewis (Undergraduate)
Human Sciences- Interior Design

Deborah Belcher (Faculty Sponsor)
Human Sciences- Interior Design

This project involves a design concept for Auntie Mame based on a historic style. Information was gathered after watching the 1958 version of the movie Auntie Mame. Analysis and evaluation of project parameters assisted with creative endeavors. The 2012 renovation of the living room of Auntie Mame's apartment, located in New York City, was of a contemporary interpretation of the Danish Modern style. Chairs and sofa with curved backs mimic the curving designs seen in the 1940's. These pieces sit on top of dark, wood flooring that runs throughout the entire space. A pearl essence, colored carpet accents the main seating area. A crystal chandelier, dangle room divider, candle décor, and period artwork provide a balance of sophistication as well as simplicity for the space. An analogous color scheme consisting of warm browns, crème's, and deep reds provides a warm atmosphere. The prominent display of wood upholds the Danish Modern look making the space appear more down to earth.

*UG102

WRECKED

Christopher Merchant (Undergraduate)
URECA, Honors College, Journalism

Jennifer Kates (Faculty Sponsor)
English

I am presenting a series of flash fiction, or stories of 200 words or less, that form a loose theme without being connected directly by plots, events, or characters. Instead, a group of 5-10 flash fiction pieces will be read aloud that each deal with the concept of being wrecked or wrecking. The first few pieces will be literal applications of the word, but progressively each piece will become more and more abstracted, ultimately ending more tragically than their earlier counterparts. For those unfamiliar with flash fiction (also known as short shorts and a variety of other terms), they are very short pieces of narrative that usually have all the recognizable story developments and mechanics of longer stories: characters, plot, a beginning, middle, and end, with conflict, climax and resolution. However, unlike short stories, flash fiction is incredibly short. As a result, it is a challenging narrative form that forces the writer to distill the story into only its most necessary parts, not unlike poetry.

*UG103

THE PERSECUTION OF PETER PENDLETON

Travis Woodruff (Undergraduate)
English

Jennifer Kates (Faculty Sponsor)
English

A fictional narrative about an ordinary, average man who experienced a life-long string of events which modern society would deem commonplace. His story is told by an unnamed narrator who says, "Peter Pendleton's life was not unique. It cannot be said that the events in his life have never happened before. In fact, the individual events in his life have happened to so many people that they might seem typical. Perhaps, it could be said that the total sum of all the events in his life and the order in which they occurred have never collectively happened to any one person, but even that is not likely. So, why am I telling his story? Even though he was not wealthy or important and never made any important contributions to the world, he deserves to be remembered. He was someone's child, a Veteran, a husband, a father, and a grandfather. In spite of all he was, he was persecuted; at every turn in his life, by everyone, and ultimately by life itself. Only I know his story, only I can tell it."

*UG104

A VERY SPECIAL EPISODE

Zach Hamilton (Undergraduate)
English

A web of 'short-short' stories (under two-hundred words) with relating themes and recurring motifs. Work is focused on perpetration of fear by trusted individuals. Examines political fears in American society and their connection to old taboos and superstitions, religious or otherwise. Includes both humorous and dramatic sections. Work includes actual excerpts from television broadcasts, political speeches, and other staples of American culture.

*UG105

"MR. FYRE"

Jacquelyn Benford, (Undergraduate)
English

Claudia Barnett (Faculty Sponsor)
English

The poem "Mr. Fyre" is a narrative letter written to a lover whose absence is causing the speaker's turmoil. Through cosmic imagery I explore the depth to which something as simple as a few wild nights spent kissing and flying through the body of the universe can lead to the illusion of true love. The speaker does not know love, but is consumed by an apocalyptic infatuation. I explore the theme embedded in the dangers of being led by one's emotions with metaphorical natural disasters, and large scale accidents that are parallel to what pain can do to the human spirit. The symbolism of things crashing and breaking contribute to the thematic illustration of a lover simply walking away and leaving his other half alone in tears. "Mr. Fyre" is a warning to those fragile hearts that like to jump off things and often shatter just to piece themselves back together. This is what can happen if one fails to maneuver carefully around the world of distorted love.