

Formal presentations

Brittany C. Baughman, Lucy Coughlin, Nichole Beebe and Courtnie Vires (psychology major)
Faculty sponsor: Kristine Turko, Department of Psychology

The Effects of Exercise and Music on Cognition

This study investigated the effects of exercise and listening to Mozart music on cognitive function. Participants were comprised of Mount Union students, faculty, or staff. Participants' cognitive performance was compared before and after exercising and before and after listening to Mozart music. Cognitive performance was assessed with alpha and beta activity as measured by EEG. It was hypothesized that both exercise and music would have a significant effect on cognition but that the conditions would not result in significantly different effects. It was found that neither exercise nor music had a significant effect on cognition.

Kourtney Betler (mathematics major)
Faculty Sponsor: Ann Triplett, Department of Mathematics

The Hardest Straight-In Pool Shot

Imagine, you are playing a game of pool and your opponent has just scratched. It is now up to you to place the cue ball anywhere you please, but you of course would like to set yourself up for an easy, guaranteed shot. What do you do? It may seem natural to place the cue ball in a position that sets up a straight-in shot where the object ball is in line with the target pocket. Would this be the best scenario for you to minimize the difficulty of your shot? Answering this question leads us to a mathematical exploration of the geometry behind the hardest straight-in pool shot. The research conducted for this project will include an investigation of basic trigonometry, calculus, and other geometric properties to help you decide where to place the cue ball for the easiest, straight-in shot.

Andrew Bonath (history major)
Faculty sponsor: John Recchiuti, Department of History

The Detriments of PTSD and War Trauma on the Psyche of Vietnam War Veterans

An SCE written at length on the effect of War Trauma and PTSD in Vietnam War Vets. Using primary testimonials, this thesis proves how destructive war is on soldier's psyches.

Michael Border (chemistry major)
Faculty Sponsor: Debra Boyd-Kimball, Department of

Spit, Please: An Exploratory Investigation Regarding the Use of Saliva as a Diagnostic Tool for Diabetes.

In this investigation, we identified salivary protein biomarkers associated with diabetes in patients with some degree of tooth loss. With diabetes known to be a comorbidity of patients experiencing severe tooth loss, saliva was collected from type II diabetic patients presenting with severe tooth loss and non-diabetic patients. Using laboratory analyses, the relative change in expression, or presence, of each biomarker was measured. Fifty-six proteins were differentially expressed, meaning a measurable difference in their presence was observed, in the diabetic patient population. Results suggest that these identified proteins can facilitate the development of saliva as an innovative diagnostic tool for diabetic patients.

Melody R. Brown (Japanese major)

Faculty sponsor: Hamako Furuhashi-Turner, Department of

Escaping Gendered Japan: The Effect of Subcultures

In a culture that is characterized for gendered socialization of its members from a young age, strong perceptions regarding what is considered the proper role for men and women have formed in Japan. While many try their best to stay true to these preconceived roles, the power of subculture has exposed the Japanese people to new ideas concerning what it means to be a man or woman. More and more Japanese people are receiving messages contrary to the Japanese societal norm concerning these roles. In an effort to minimize the pressure of strict gender roles, Japanese people are beginning to rely on subcultures as a form of escapism. Using examples from music, fashion, and media, aspects of Japanese subcultures and their effect on the gendered nature of Japanese society will be discussed.

Holly Carson (Physician Assistant Studies)

Faculty Sponsor: Katharine E. Harpley, Physician Assistant Studies

Valerian and its effect on Insomnia

Valerian root is an herbal supplement that has been used for years to help with many disorders, one of which is difficulty falling asleep. Its mechanism of action is not perfectly known, but it seems to act on the brain and central nervous system, producing a mild sedative effect. Through use of published experiments and scholarly articles, the effectiveness and safety of this drug will be studied, and a proposed "clinical guideline" for practicing medical professionals will be determined

Alexander M. Chartrand (physics major)

Faculty sponsor: Steve Cederbloom, Department of Physics and Astronomy

Holographic Vibrations: Studying trumpet vibrations using holography

The study of how instruments work is very important to acousticians and musicians alike. When we look at an instrument being played, we cannot see the small vibrations of the surface of the instrument. Holographic interferometry, however, is a process that uses holograms and the principle of interference of waves to visibly show vibrational patterns of resonating objects. Holograms not only reproduce an image, but also record information – such as phase – of the light that is exposed to it, so when light waves “meet” in the hologram, they interfere. Because of this interference, bright and dark patches occur on the vibrating object to show where it is vibrating least/most. I used this technique to study the vibrational patterns of a trumpet to explore properties of the bell and lead pipe, specifically to study the effects of a dent on a trumpet bell on its vibrational patterns.

Caroline S. Ch’ng (mathematics major)

Faculty sponsor: Michael Zwilling, Department of Mathematics

Real or Fake? Did Clement really write the Mar Saba letter?

Do you think that you may have found a will making you an heir to millions of dollars? Using statistics can help you decide if the will is genuine or a forgery. In my presentation I will look at the case of the Mar Saba letter, a controversial document supposedly written by Clement of Alexandria, which contains excerpts from the so-called “Secret Gospel” of Mark. There is evidence that the Mar Saba letter is a forgery. My research looks at the statistical analysis of the argument that the letter is “hyper-Clementine” and therefore, may have been forged.

Mary K. Erwin, Allison Larson, Courtney Briceland and Gwendolyn MacPherson (psychology majors)

Faculty sponsor: Tamara Daily, Department of Psychology

Attitudes towards Tattoos and Piercings: The Effect of Participant Generation and Type of Modification

The goal of this study is to explore the perceptions of people with tattoos and piercings. This study will explore the impact of participant generation (faculty/ staff vs. student) and the level of body modification (moderate vs. extreme) on attitudes toward tattoos and piercings. We expect to find that the group containing the faculty and staff will report more conservative attitudes towards body modifications than the group composed of traditional age students particularly when primed with images of extreme modifications. We predict that participants

will react more negatively when primed with extreme examples of piercings/ tattoos. It is important to examine attitudes towards tattoos and piercings, because such body modifications have become more common in today's culture.

Kaili A. Gehring (Physician Assistant Studies)

Faculty Sponsor: Katharine E. Harpley, Physician Assistant Studies

Red Yeast Rice: A Safe and Effective Herbal Treatment for High Cholesterol?

Red yeast rice (RYR) is a Chinese herbal that has been used for cardiac health for hundreds of years. It contains up to 10 compounds that are similar in chemical structure to a class of medications called the HMG-CoA reductase inhibitors or statins (such as Crestor® or Lipitor®) for lowering high cholesterol. The purpose of my research was to conduct a review of the existing literature to determine if RYR is a safe and effective alternative of the statin class for the treatment of high cholesterol and if it can effectively be instituted into a patient's treatment plan. The research shows that RYR is very effective in lowering cholesterol levels with side effects similar to those of the statin class. However, a significant risk of drug interactions and lack of FDA regulation limits its clinical use because many available products have varying amounts of effective compound and toxic by-products.

Chris A. Hershberger (mathematics major)

Faculty sponsor: Ann M. Ritchey, Department of Mathematics

Title needed

Do you think it would be beneficial to take a five yard penalty to better your chance at making the game winning field goal? Yes it sounds strange, but Wes Fesler, the head coach of the Ohio State University, thought so and during the 1950 Rose Bowl against the University of California took a delay of game penalty with 1 minute and 55 seconds remaining and the game tied at 14-14 to move them back five yards. Did it pay off? We will look at it this situation from a mathematical point of view and see if it was mathematically beneficial. We will also see if it is advantageous with the changes in the NCAA field dimensions that have taken place over time.

Vincent C. Gregoric (computer science major)

Faculty sponsor: Steve Cederbloom, Department of Computer Science and Information Technology

Titans of the Night Sky: Studying Colliding Galaxies

There are many galaxies in our universe that do not follow the typical spiral pattern exhibited by our own Milky Way. One way that unusually shaped galaxies may have formed is through the collision of two separate galaxies. In order to test this theory, physicists have tried to

recreate the observed structure of strangely shaped galaxies using computer programs that simulate galactic collisions. Since there are many factors to consider, these programs can become very complicated. I have attempted to achieve reasonable results using a relatively simple program to model galactic collisions. In this presentation, I will overview my program and compare my results with the work of others in this field.

Laura Griffin (economics major)

Faculty sponsor: Xiaoshu Han, Department of Economics, Accounting and Business Administration

The Challenging Costs of Cancer Care

Cancer is one of the world's leading causes of death as well as one of the most costly illnesses in health care to treat. This presentation explores the financial challenges that cancer places upon patients, employers, and their insurance companies. Using research found by the National Cancer Institute, along with many other resources, this presentation outlines the challenges, possible solutions, and ways to reduce patient and employer costs and still treat efficiently. Research focused on examining data sets that involve the national expenditures for cancer, broken down by the most common types, in addition to looking at the financial expenditures of the patients' first year, continued care, and final stages. After analyzing the data, the findings revealed no concrete answers to cutting the cost of cancer care, but if this problem is not addressed soon, the national health care debt will continue to rise.

Jacie L. Iden (health major)

Faculty sponsor: Beth Canfield-Simbro, Department of Health

Title

Alliance is #1...for Childhood Injuries in Stark County. Where is the problem?

I conducted surveys and interviews with teachers, nurses, and emergency respondents relating to the 44601 childhood injury reports. This work was completed for the Alliance Area Childhood Injury Task Force. Surveys targeted health issues. Amanda Kelly of the Stark County Health Department helped me devise questions and distribute to those knowledgeable of Alliance's injury rates. There is currently not enough data available, particularly qualitative data. Gathering this sort of data helped the Task Force pinpoint certain safety issues.

Brandon A. Jarvis, Jesse McKnight and Brian Felger (exercise science major)

Faculty sponsor: Ronald W. Mendel

The Effects of Pre-prandial and Postprandial Exercise on Energy Expenditure

Have you ever wanted to lose an extra couple pounds but found yourself stuck at the same weight? Perhaps there is a way to still lose weight without eating less or exercising more than

you already are. This study investigated the impact of meal timing on caloric expenditure. We hypothesized that consumption of a meal prior to exercise will result in a greater caloric expenditure than if the meal is consumed after exercise. The results of this study apply to any individual seeking to lose weight or reduce the stress of weight maintenance. Maintaining a healthy weight reduces the risk of disease and improves self-esteem.

Kyle M. Jozsa (political science major)

Faculty Sponsor: William Cunion, Department of Political Science

The Catch-22 of African American Representation

With reapportionment of Congressional districts looming, an examination of racial gerrymandering is appropriate. There may be a direct relationship between the number of African Americans in Congress and the number of Republicans. The consequence is a “Paradox of Representation,” as labeled by author David Lublin, in which added descriptive representation is achieved at the cost of substantive representation; in other words, the more minorities in Congress, the fewer Democrats. Using quantitative analysis of data collected from Congressional districts, this article investigates the extent of this apparent catch-22 and explores the established norm of proportionality in these districts. The author finds that while there is a significant relationship between majority-minority districts and the number of African American representatives, there is also a strong correlation between the number of black representatives and Republican representatives in Congress.

Carly A. Kalish (biology major)

Faculty sponsor: Charles McClaugherty, Department of Biology

Campus Energy Use and Emissions Tracking

To contribute to Mount Union’s sustainability initiatives, I created a tool that will monitor and manage the utility usage information for each building on campus and will convert this information into resulting greenhouse gas emissions. The spreadsheet provides the usage and cost of water, electricity, and natural gas for each of the main buildings, and translates this information into cost per square foot and per occupant, and into carbon dioxide, methane, and nitrous oxide emissions. The spreadsheet will be supplemented with a user’s manual, so it can easily be updated in the future. I have also researched what methods other colleges and universities have used to decrease their utility use, and provided suggestions as to which of these could be implemented here.

Thomas L. Karos, Kathryn Seitz, Eric Williams (exercise science major)

Faculty sponsor: Ronald W. Mendel, Department of

Development of Maximal Power Output at Different Percentages of One Repetition Max in Trained Male Athletes: Influence of Hydration Status

It is quite common for wrestlers to lose a significant amount of weight a few days prior to competition primarily through the loss of body water. The purpose of this study was to determine the effects of dehydration on power output in male collegiate wrestlers. Wrestlers are subject to dehydration to reach competition weights. This study attempted to determine if the dehydrated state has a negative effect on the power output and performance (explosive ability) compared to the euhydrated (normal) state of hydration. The results of this study can benefit both athlete and coach in determining proper weight cutting practices to enhance performance. This study is only the first step in a line of projects necessary to fully address the hypothesis. Data analysis was not complete at this writing but will be presented during the presentation.

David Z. Keifer (chemistry major)

Faculty sponsor: Jeffrey A. Draves, Department of Chemistry

Chemistry on a Computer: Theoretically Modeling Combustion

Conducting chemical reactions and measuring their energies can be difficult and expensive. Sometimes the chemicals of interest do not even exist! Here, exotic chemicals were modeled with computer software, and their reaction with oxygen was studied and quantified. First, however, the calculation methods used to model these exotic reactions had to be checked against a well-known reaction to ensure that the methods were accurate. Therefore, the combustion of ethane was studied computationally, and it was found that the computer quantified the energies involved quite well. Since the methods were accurate, they were applied to the combustion reaction of exotic nitrogen-containing rings. These rings should be higher in energy than typical chemicals used in combustion—the type of reaction which ultimately supplies most of humankind’s power—because of the highly energetic nitrogen. If this is the case, then these nitrogen-containing rings could potentially be used as alternative fuels.

Daniel P. King (geology major)

Faculty sponsor: Mark A. McNaught, Department of Geology

The Carbon Footprint of Pollen

Fossilized pollen often gives scientists qualitative insights into what climates, ecosystems, and photosynthetic organisms were like millions of years ago. However, in order to make quantitative models and simulations, scientists must rely on biogeochemical analyses. A subtropical field study and laboratory experiments were conducted in order to construct another model based upon the relative amounts of carbon-13 to carbon-12 isotopes in the pollen of two genera of flowering plants. More specifically, the effect of temperature on the relative amounts of carbon-13 to carbon-12 isotopes in pollen was analyzed. Results indicated that in field studies, temperature is almost directly correlated with the carbon isotopes in

pollen. However, the results in laboratory experiments indicated a significantly weaker correlation between temperature and the carbon isotopes in pollen. Therefore, the laboratory studies suggest that the carbon isotope values in field studies may not only be influenced by temperature, but other variables as well.

Danielle L. Lutz (exercise science major)

Faculty Sponsor: Ronald W. Mendel, Department of

The Effects of Different Types of Music on Resting Metabolic Rate, Aerobic Performance and Muscular Strength

Music has a profound effect on the lives of most Americans. Whether they are using it as a form of expression or entertainment, most people listen to music every day. Quite frequently music is also used as an ergogenic aid during exercise. The goal of this study was to detect any significant changes that may occur when music is added to a specific workout. Twenty male college students freely participated in this study which was aimed at measuring resting metabolic rate, aerobic capacity and muscular strength under three different conditions. Each participant performed these three tests under no music, relaxation music and pump-up music conditions. Results from each test were compared to other conditions to find any significant changes in participant's performance. Data collection was not complete at the time of writing but will be presented during the formal presentation.

Clark J. Magdych (political science major)

Faculty sponsor: Francis Schortgen, Department of Political Science

The Last Days of the United States? Why Lessons from Europe could be America's Best Hope for Salvation

America and Europe have deviated in the development of their socio-economic systems since the era following WWII. This study considers the social, economic, and institutional differences between America's liberal market economy and Europe's social market economies and asserts that the European model provides the more stable, egalitarian brand of capitalism, less prone to the risky behavior resulting in economic collapse. This claim is defended through the operationalization of variables that measure social development, including societal equality, standard of living, and quality of life against a variety of independent economic and social indicators in a linear regression model. Results defend Europe's relative superiority over the US.

Katherine M. McConnell (English – writing major)

Faculty sponsor: Rodney F. Dick, Department of English

The Cultural Distortion: Maintaining Credibility While Struggling with Issues of Sensitivity and Accuracy

This project stemmed from the researcher's five-month study abroad experience in West Africa. Her struggle to tell the stories of her and others' experiences culminated into a fascination of how established writers attempt to bridge the gap between their natural voice and style and the foreign voice and style of the cultures in which their stories and characters reside. The distortion that often results from these attempts can lead not only to a disruption of the author's own credibility (ethos) but also to misconceptions of the culture being written about. The researcher chose to exercise these realizations through writing a series of vignettes, or short short stories, demonstrating the idea that her (and all writers') cultural "filters" will stand in the way of telling the stories of other cultures 100% accurately.

Patrick R. McGarvey (Japanese major)

Faculty sponsor: Hamako Furuhashi-Turner

SUCCESS IN JAPANESE: A DIFFERENT APPROACH TO A JAPANESE LANGUAGE TEXTBOOK

"Success in Japanese" is a student's attempt to present a textbook that teaches the Japanese language in an order that is both less confusing to students and more thorough than standard Japanese textbooks by utilizing a system of grouping similar grammatical elements rather than similar conversational elements.

Victoria M. Miller (philosophy major)

Faculty sponsor: Scott Gravlee, Department of Philosophy and Religious Studies

The Gloves are Off: The Evaluation of the Problem of Dirty Hands

Can one ever govern innocently or is it always a matter of getting one's hands dirty? Through the combination of ethics and political philosophy I seek to examine the validity of The Problem of Dirty Hands in politics. I use the ethical theories of Utilitarianism and Kant further understand what the role of morality is in politics. I will review deeply what has been said by scholars on the topic. Combining the application of theory and real life examples I hope to uncover whether morality can play a role in politics or if politics is essentially 'dirty handed'.

Stephanie Monsanty (history major)

Faculty sponsor: John Recchiuti, Department of History

A Pragmatic Solution: Historic Diversity as the Foundation for the Free Exercise Clause

The First Amendment of the U.S. Constitution contains a phrase known as the Free Exercise Clause, which guarantees Americans the right to practice their religion freely. Up until that point in American history, individual colonies had the power to choose which religions to tolerate or prohibit within their boundaries; the clause therefore changed the face of American religious life forever. Although the Free Exercise Clause is often considered a piece of legislation grounded in Enlightenment ideals, my study of primary documents and scholarly works suggests that it was actually a pragmatic move on the part of the Founding Fathers. The incredible religious diversity of the American colonies made the clause both practical and necessary in the new United States of America.

Kelly L. Morckel (German major)

Faculty sponsor: Frank Triplett, Department of

Utopian Spaces and Broken Dreams in J.M.G. Le Clézio's Writing of Mexico

Nobel laureate and well-known defender of Amerindian cultures, French author J.M.G. Le Clézio mourns the demise of pre-Columbian Mesoamerica in essays such as “The Mexican Dream” and “La fête chantée.” In his 2006 novel *Ourania*, he examines the story of an ephemeral utopian community called “Campos” alongside the horrors of child labor, clandestine prostitution, and environmental exploitation in the Mexican State of Michoacán. In undertaking this research project, I aim to understand Le Clézio’s conceptualization of the utopian space and to show how, amidst the echoes and ruins of an interrupted pre-Columbian universe, *Ourania* constitutes a biting commentary on post-colonial modernity, epoch which Le Clézio deems “closer than any other to the age of Thomas More.”

Kelsey F. O’Driscoll (exercise science major)

Faculty sponsor: Ronald W. Mendel, Department of

The Effects of the Menstrual Cycle on Physical Performance

The correlation between female exercise performance and the menstrual cycle is an area that is in need of much scientific attention. Previous studies have been tightly controlled and address the hormonal responses to exercise or the stress level of the female during menstrual related testing. The purpose of this study was to determine if the different phases within the menstrual cycle impacted aerobic, anaerobic and strength measurements. Six college-age healthy females performed sprints, timed one-mile run, and a modified push-up test to exhaustion. Subjects performed these tests on days 1 & 2 (follicular phase) and 14 & 15 (ovulatory phase) with no alterations in lifestyle. Data collection was not complete at the time of this writing, but final results will be presented during the formal presentation.

Annie Patton, Jill Fitch and Lisa Ruthrauff (exercise science majors)

Faculty sponsor: Ronald W. Mendel, Department of

Barefoot: Training Style or Lifestyle?

With the increasing trend of barefoot/minimalist training in the world of athletics, much more data must be collected and examined for appropriate conclusions to be drawn. Many studies have examined the health benefits of barefoot training (i.e. joint stability, joint impact, etc.), but few have examined the natural performance enhancements that often result from barefoot training. This study compared performance improvement between individuals who trained barefoot/minimalist with individuals who adopted a barefoot/minimalist lifestyle to see which tactic resulted in the greatest improvement in a one-mile timed test. Data collection and analysis was not complete at the time of this abstract submission, but will be available at the formal presentation.

Todd D. Pence and Greg Kemmerline (accounting major)

Faculty sponsor: Patricia Matthews, Department of Economics Accounting and Business Administration

A Top-Down Approach to Investing in Today's Market

This project employs a top-down approach to investing in today's market. Our top-down approach to investing began by researching the current state of the U.S economy through various economic indicators and expert opinions. From there, we used several industry reports, industry ratios, and regression analysis to gauge the current position of the fast food industry. Lastly, we did extensive fundamental and technical analysis on two major fast food companies – Yum! Brands and Wendy's/Arby's Group – in order to determine their investment potential. Overall, we were able to provide a developed and supported recommendation regarding each of the three areas of focus.

Ly M. Pham (mathematics major)

Faculty sponsor: Michael Zwilling, Department of Mathematics

Black-Scholes Option Pricing Model - Explanation and Application.

In the early 1970s, Fischer Black, Myron Scholes and Robert Merton made a major step in financial engineering by developing a model for the pricing of stock options. The presentation will explain the model and illustrate the factors and variables that can influence the dependent variable. The model predicts the call option value from the stock price and the time variable under the assumptions of an ideal market, and that the stock price follows a random path. The strike prices, expiration date, volatility of the stock and interest rate also have an important part in influencing the option price. Hedgers use options to cover their positions and avoid risk,

and investors use options to speculate any arbitrage opportunity they can recognize. The pricing of option, therefore, plays an important part in the diverse and efficiency of the financial market.

Joshua N. Pickens, Stephen Flanagan, Sayre Jones and Caitlyn Ryan (psychology majors)
Faculty sponsor: Tamara Daily, Department of Psychology

The Effects of FYE Participation on Students' Perceptions of Bullying among College Students

The purpose of this study is to examine how participation in the First Year Experience program affects perceptions of bullying and hazing at the collegiate level. We plan to test whether or not participation in the FYE program can predict the way in which students think about bullying and hazing. This study is a follow-up and extension of research conducted by Drs. Torok and Piker-King and will address the following questions comparing FYE and non-FYE students: how often students report seeing and/or being involved in bullying on campus, perceptions of cohesion within one's matriculation class, and attitudes toward bullying, victims of bullying, and bullies.

Nicole M. Plant (economics major)
Faculty sponsor: Martin Horning, Department of Economics Accounting and Business Administration

Living on a Sweating Planet: A Look into Carbon Capture and Sequestration Pilot Projects

Imagine if the world could sweat. If the world could get a fever and tell the people inhabiting it that it's unbearably hot. Carbon emissions due to human industrialization, has consistently increased the greenhouse effect on the earth. CO₂ is a gas directly connected with human activities. Due to this, carbon emissions can be tracked and sources easily marked. Methods of attacking the dispersion of carbon dioxide have been studied and put into place in some areas of the world. This project investigates the techniques used to capture and/or sequester carbon dioxide. It addresses why carbon emissions are a problem, what is being done to control emissions, how experts plan on doing so, and where the captured/sequestered carbon will be stored. Defeating global warming is possible and carbon emission control is essential in doing so.

Aaron D. Reese (history major)
Faculty Sponsor: Theresa Davis, Department of History

Since the First Zoetrope Spun: A History of Animation

This presentation explores the history of animation, mostly in its American form. It shows how the field has changed over the years, which the major pioneers were, the techniques used over time, and how this genre has shaped important events in history. The research mostly comes from animation historians, and their books and articles are considered to be the epitome of research in this field. I have taken an approach to look at this subject from many different points of view. I hope to show you that animation is not just a form of entertainment, but an art form unto itself. It has, believe it or not, shaped every one of us in some way.

Carla M. Rose (Physician Assistant Studies)

Faculty Sponsor: Katharine E. Harpley, Physician Assistant Studies

Fever Management in Children

Fever is the most common reason parents bring their children to the emergency room or to their health care provider. This is attributed to the so-called “fever phobia,” which is characterized by the fear that a fever will be directly harmful to their child. My goal with this research was to develop a plan for parental education on fever, when to treat, and how to safely treat fever when it manifests in a child. Many caregivers do not know the proper medication dose, when to give it, or what medication to use. I am comparing the effectiveness of acetaminophen (Tylenol) and ibuprofen (Motrin), and developing a personalized education program for parents. This will have my recommendation for the management of fever when intervention is required or desired by the parent for the child’s comfort. My research suggests that ibuprofen shows a slightly higher efficiency in maintaining fever reduction in children.

Corey J. Rose, Jason Gudalis and Jason Gennaro (computer science majors)

Faculty Sponsor: Clark B. Archer, Department of Computer Science and Information Systems

Tremors 2K11: SEISSearch

SEISSearch is a program that was created by students and developed for geologists and geology students around the state of Ohio. It is designed to analyze seismic data collected from The Ohio Seismic Network monitoring stations. The programming team modified the existing SEISSearch program to enhance the program's functionality. The main focus of this project was to enable SEISSearch to retrieve and display data from multiple stations concurrently. Another enhancement goal was to add mathematical filtering functionality so the data may be studied more easily. The updated program will make the research of earthquakes and other seismic activity easier for geologists.

Kellie R. Seward (education major)

Faculty sponsor: Shawn D. Watters, Department of Education

Nutrition's Effect on Cognitive Development and Cognitive Functioning

The intention of this study was to identify whether or not good nutritional habits affect student cognitive development and functioning. By reviewing documents, conducting observations, and performing interviews recommendations will be formed to improve nutritional standards in schools. Three participants were interviewed on two different occasions, once on the subject of nutrition in the schools and once on cognitive development and cognitive functioning. Documents such as school lunch menus and the Ohio Department of Education Nutritional Guidelines were evaluated. It was found that schools who prepare meals on site are more nutritionally sound. Additionally, students who are educated about nutrition have better cognitive functioning and are healthier now and later in life.

Edward M. Silvers (political science major)

Faculty Sponsor: William Cunion, Department of Political Science

Unyielding Resolve and Theological Righteousness:

An Analysis of Evangelicalism's Effects on the Legislative Decision Making Process

Ever since the presidency of Born-Again Christian George W. Bush much academic focus has been rightfully placed on the role of theology in the decision making processes of elected officials. Evangelical Protestantism, with its beliefs of biblical literalism and the polarization of good and evil, has been the focal point of this attention. Unfortunately, while there is an abundance of literature pertaining to its effect on the presidency, very little attention has been extended to its possible effects on the legislative branch. This study attempts to remedy that particular hole in the literature by examining the correlation between theology and a representative's willingness to compromise, as measured by the amount of uncompromising language utilized in their congressional rhetoric. The results of this inquiry suggest that there is a statistically significant correlation between Evangelical Protestantism and amount of uncompromising rhetoric utilized.

Mary K. Snode (mathematics major)

Faculty sponsor: Ann M. Ritchey, Department of Mathematics

Free Throw Mathematics

Have you recovered from March Madness? Did you witness any games that came down to free throw shooting at the end? You may wonder what the secret is behind shooting free throws at a high percentage. Surprisingly enough it's Mathematics! I will investigate the relationship between the height of a player, the shooting angle of the ball, and the velocity of the basketball when shooting a free throw. Using calculus based equations and their models, I will find the best combination of the variables above, in order for players to be successful at the free throw line. What is your equation for shooting a free throw?

Madeline K. Sofia and Andrew Loudon (biology major)
Faculty Sponsor: Jonathan Scott, Department of Biology

The Effectiveness of an Amphibian Immune System against the Lethal Fungal Disease
Chytridiomycosis

Batrachochytrium dendrobatidis is a pathogenic fungus that causes Chytridiomycosis, a fungal disease which has contributed to worldwide amphibian decline. *Ambystoma mexicanum*, one salamander species (commonly known as axolotls) endemic to Mexico, has suffered widespread and catastrophic declines in the wild. Identification of infected axolotls and understanding the susceptibility factors of the animal are essential to prevent the spread of the pathogen by trade of the animal, and also in efforts to help protect the species. In amphibians, two frequently studied areas of the immune response are the antimicrobial peptides produced by the glandular cells in the skin, and the compounds produced by the bacteria living on the skin. This study sought to gauge the antifungal ability of both the antimicrobial peptides and compounds produced by the cutaneous bacteria; in efforts to attain a deeper understanding of one of the potential factors contributing to the decline of the species.

Patricia A. Topper (computer science major)
Faculty sponsor: Louise Moses, Department of Computer Science and Information Systems

A Virtual Tour of the Stahl House

The goal of this project is to build a virtual three-dimensional model of the Stahl House, in the software program Autodesk Maya. The Stahl House is a famous modern style house that is located in California. It was designed by the architect Pierre Koenig. The project will include a timed walk-through virtual tour of the three-dimensional exterior and furnished interior of the building.

Mary K. Vallinger, Natalie Larkin, Calie Makoski and Kristin Wright (psychology majors)
Faculty sponsor: Kristine Turko, Department of Psychology

Factors that affect conflict resolution: An investigation of the relationship between social technology, gender, personality type, and social anxiety

With the growing popularity of technological communication via text messaging and social networking sites it is important to examine the effect socially interactive technologies are

having on young adults' preferred method of conflict resolution. Socially interactive technologies are giving individuals a way to avoid face-to-face conflict by being able to solve disputes in a less personal and less intimate way, which may diminish the need for effective conflict management skills in young adults. The current study examines socially interactive technologies along with gender, personality type, and social anxiety on the choice to solve conflict through socially interactive technologies rather than face-to-face.

Amber Veverka (English – literature major)

Faculty sponsor: Andrew Price, Department of English

Stupid Lamb: Reflections on a Popular Novel Series for Teenage Girls

My project ventures to answer the question of whether or not Stephenie Meyer's Twilight novel series presents an appropriate role model in the main character, Bella Swan, and conveys decent values for the target audience of teenage girls. This query is so crucial because the readership for Twilight has expanded at a rapid rate and the effects of the novels have not been thoroughly analyzed by literary scholars. Over 70 million Twilight novels have fallen into the hands of young women and carry with them undeniably destructive themes. With an approach partially influenced by feminist values I have investigated the entire series in order to assess Bella's role and the possible effects the novels could have on the lives of readers. I have ultimately found that the Twilight novels present a negative role model and negative life values for teenage girls.

Emily L. Wagner (chemistry major)

Faculty sponsor: Jeffrey A. Draves, Department of Chemistry

Effectiveness of Demonstrations in the General Chemistry Classroom and the Impact on Student Understanding

Are demonstrations in the classroom educational or entertaining? Previous research has shown that demonstrations in the classroom can be beneficial if there is student interaction and reinforcement. The goal of this research was to determine whether live or video demonstrations were more effective in student understanding and whether demonstrations should be utilized in the classroom. Three general chemistry classrooms were examined with control group receiving the video form of the demonstrations and the experimental group receiving the live form of the demonstration. Six demonstrations were shown in the classroom and then assessment data was recorded. Various assessments were then analyzed and correlated to the number of times students viewed the videos on ANGEL. Demonstrations were found to only be effective in the classroom if reinforced consistently. Students used the video demonstrations as study aids and there was a definite trend that the more students viewed the videos, the better the overall performance on assessments. I also found out that in viewing the demonstration only once, neither form of the demonstration had significant difference in assessment scores compared to students who never viewed the demonstration.

Jessica A. Warneke (chemistry major)

Faculty sponsor: Debra L. Boyd-Kimball, Department of Chemistry

Analysis of protein oxidation and expression in brain tissue of mice fed a short-term high fat diet

Oxidative protein damage in brain tissue is believed to be involved in the pathogenesis of neurodegenerative diseases such as Alzheimer's disease. Studies have found that certain lifestyle choices, such as one's diet, may be connected to levels of expression and oxidative damage of protein. In this research, protein oxidation in the brain tissue of mice fed a high fat diet was analyzed by redox proteomics using electrophoretic separation techniques and immunochemical detection. Results of this study can be analyzed to determine differences in levels of varying proteins within the cells and oxidation of those proteins. Proteins that show significant differences in expression and oxidation may then be identified by mass spectrometry and may be found to be related to important proteins in neurodegenerative processes.

Rachel E. Wood (religious studies major)

Faculty sponsor: Susan Haddox, Department of Philosophy and Religious Studies

The Hymns of Charles Wesley: Relevant or Not?

The hymns of Charles Wesley provide a large portion of the foundation of the United Methodist hymnal. In the present day, there seems to be a movement away from traditional hymn-singing, particularly among young people, since these hymns do not seem to have much relevance to modern times, and hymns are traditional (read: old-fashioned). This study counteracts this thinking, demonstrating that hymns have an important historical relevance in addition to one for modern times. It examines the hymns of Charles Wesley as they existed in the early days of the United Methodist Church and in current times, analyzes hymn-usage in the United Methodist Church of the twenty-first century, and applies all of this to worship and devotional life in modern United Methodist churches.

Linnan Zhang (mathematics major)

Faculty sponsor: Michael Zwilling, Department of Mathematics

The Value of Waiting to Invest in a Project

This paper develops a theoretical model for the value of delaying an investment in a project, such as a large building project. A rule for the decision on when to invest, and an explicit formula for the value of waiting to invest are derived, under the assumptions that the investor

is risk-averse and is well-diversified. It is shown that for reasonable parameter values we should wait until the benefits are twice the investment costs.

Margaret A. Zronek, Samantha Rondini and Krista Johnson (exercise science major)

Faculty sponsor: Ronald W. Mendel, Department of

Effects of a Popular Commercially Available Supplement on Speed and Agility

Sport supplementation is a multibillion dollar industry which purports the next “greatest thing” to help the general population, and athletes alike, achieve their goals. However, in reality, very few sport supplements have been properly tested for their effectiveness. The purpose of this study was to test the effectiveness of “Fast Fuel” in different populations (recreationally active individuals and collegiate athletes). The study examined the impact of the supplement on maximum velocity (speed) and agility. Subjects initially performed baseline testing which consisted of ten 50-meter sprint intervals (with a 1-minute rest period in between each), followed by a 30-minute rest period, and then ten T-tests for agility (with a 1-minute rest period in between each). Second and third trials were also performed consisting of the same baseline tests, where subjects were blindly given either Fast Fuel or a placebo. Final conclusions will be presented during the presentation.