

FORMAL PRESENTATIONS *(in alphabetical order)*

Laura Ambrose, Kristopher Claros, Brooke Luczywo, Joseph Millings and Allysia Tubbs
(psychology majors)

Faculty Sponsor: Tamara Daily, Department of Psychology

Peers' Perceptions of Students Labeled ADHD

We examined the effect of varying labeling and behaviors and symptoms associated with attention-deficit hyperactivity disorder (ADHD) on college students' peer perceptions of students with ADHD. We administered several questionnaires to Mount Union College students. We hypothesized that students would report negative feelings toward other students that were labeled as having ADHD. We hope that our research will be useful in the reduction of ADHD stigma.

Nate Berkey (history major)

Faculty Sponsor: John Recchiuti, Department of History

World War I's Effect on War Theology and Post-War Christianity

In my SCE I examine elements in American Religious History in the era of the First World War. I argue that the war affected notions of Christian manhood, church and state relations, and theology and gospel interpretation. American Christendom was, I find, transformed by the war.

Justin Bonanno (information systems major)

Faculty Sponsor: John Kirchmeyer, Department of Computer Science and Information Systems
Information Technology - Advanced Functionality within Databases

For this project, I created an experimental database, designed a program that could utilize it, and explored advanced functionality that could be applied to the database itself. I did this by thoroughly researching how to get the most out of one's database, mainly with the help of online books found on Safari - an online catalog of books available to students at Mount Union. My research concluded that applying advanced features to a database can make it more efficient, but can also hinder its performance if not properly applied.

Alicia Bousner (psychology major)

Faculty Sponsor: Amanda Abbott, Department of Music

The Audition: It is Not Quite What You See on American Idol

Contrary to what is seen on "reality" television, the reality of a graduate audition is a lengthy process involving years of study, extensive preparation and a demonstration of both musical excellence and amiable personal qualities. For those with no or limited exposure, the process can be quite difficult and daunting. This research examines the process of auditioning at the graduate level starting with some basic "do's" and "don'ts" as well as looking at the preparation (both musically and emotionally), the audition itself and what can happen when it's all 'sung' and done.

Alicia Bousner, Logan Erwin, Kelsey Jones, Alyssa Myers and Kiel SeEVERS

(psychology majors)

Faculty Sponsor: Tamara Daily, Department of Psychology

The Effect of Gender and Level of Offense on Preferred Social Distance from and Community Protection Policies Related to Released Sex Offenders

We sought to assess attitudes toward sex offenders based on their specific attributes. We examined how comfortable participants were with reintegrated sex offenders of both genders and varying level of offense. Attitudes were assessed in terms of preferred forms of protection and notification as well as preferred social distance from sex offenders. We hypothesized that participants would be more comfortable with female offenders than male offenders; preferred social distance would increase with the severity of crime; and the level of protection desired from those who have committed Tier I and Tier II offenses will be less than for Tier III.

Katherine Bowman (psychology major)

Faculty Sponsor: Kristine Turko, Department of Psychology

Quality of Family Environment in Relations to Exposure of Domestic Abuse

In this study, the researchers will attempt to determine if exposure to domestic abuse has a significant effect on college students' perceptions of the quality of family environment and other relationships, using qualitative measures. They will also look to see if there are any significant correlations between exposure to abuse and risk factors, which could also serve as mediating factors. The hypothesis is that experiencing a high frequency and severity of abuse will have a negative impact on perception of relationships. It is also expected that there will be a positive correlation between level of abuse and each risk factor.

Brittney Bunn, Steve Cotman, Ryan Brooks and Beth Herman (biochemistry majors)

Faculty Sponsor: Debra Boyd-Kimball, Department of Chemistry

Lifestyle Aspects and Oxidative Stress: Implications for Alzheimer's

Alzheimer's Disease is the seventh leading cause of death in Americans of all ages. Because this disease is becoming more prevalent, the research to aid in the understanding of Alzheimer's Disease is important. Oxidative stress has been proposed to play a contributory role in the Alzheimer's disease process. The purpose of this study was to determine the effects of calorie restriction, high fat diet, exercise, environmental enrichment, and nutrient and antioxidant supplementation on oxidative stress in a rodent model. The results of biochemical tests completed to determine the level of oxidative stress in the brain will be presented.

Bethany Camp (Spanish major)

Faculty Sponsor: Gregg Courtad, Department of Foreign Languages

"Matar o Ser Matado (Kill or Be Killed)"

I completed an extensive research project on the controversy surrounding bullfighting in the Hispanic world. There are many different dimensions to the bullfight which are highlighted in this presentation. I focused on the history, process, customs, culture and controversy of the game. Many people support this ancient practice because of its cultural significance to the Hispanic world, while others strongly oppose the fight due to its very dangerous and brutal treatment of both performers and animals alike. I will explain both sides of the argument and why they both feel so strongly about their views.

Thomas Carli (English: literature major)

Faculty Sponsor: Michelle Collins-Sibley, Department of English

Barbarism Outside the Gates: The Evolution of Our Language and What Might Happen If the Levees Break

Using several different perspectives in examining the function of language -- a literary, an educational, as well as a communications standpoint -- all helped to better understand the amalgam of diversity that is our language. Various interviews with teachers, Eliot's "Tradition and the Individual Talent," Bloom's *The Anxiety of Influence*, the subject of code switching, and the evolutionary history of the English language were all used to understand the urgency and importance of our language concerning its function in communication, academia, and work. Just as language adapts to better meet the needs of its speakers and writers, so too must its users also evolve.

Nichole Caroniti (early childhood education major), **Rick Antelli and Ed White** (business administration majors)

Faculty Sponsor: Ivory Lyons, Department of Philosophy and Religious Studies

May the Force Be with You

The group researched the connections between Buddhism and the Star Wars series. The presentation focuses on four Buddhist principles found in Star Wars. By researching, watching the series, and obtaining information from Dr. Lyons in his Buddhism in Film course, the group has evidence of the many ties between Buddhism and Star Wars. The group has discovered that the Star Wars series is based largely upon Buddhist concepts.

Alexander Chartrand (physics and astronomy major)

Faculty Sponsor: Steven Cederbloom, Department of Physics

Fractal Lake

Geological features are of great interest to both astronomers and geologists. Unlike geologists, however, astronomers cannot simply visit the geological features they want to study. This is where certain properties of geological features may be used to determine the cause of their formation. I created a program to measure the fractal dimension of the coastline of Crater Lake, a caldera lake in Oregon. By comparing this data to geological features on distant worlds, we may be able to more easily determine the origin of geological features we cannot visit up close.

Brian Crofoot (biology major)

Faculty Sponsor: Lin Wu, Department of Biology

Bioassay on Effects of Water Types on Copper Sulfate's Toxicity on Duckweed

Copper sulfate is an herbicide that can kill many plants. This bioassay experiment used its ability to kill duckweed, which is a plant from the genus *Lemna*, in four different types of water. Some objectives were to determine how the different types of water affect duckweed's survival chances when exposed to certain concentrations of copper sulfate and to determine a lethal concentration 50 percent for the duckweed in the copper sulfate solutions. An ANOVA analysis was performed using a p-value of 0.01. It was determined that the concentrations of copper sulfate and the water types affect the duckweed's survival rate.

Caitlin Danley, Diana Border, Chelsea Costello, Aubrey Loy and Jennifer-Lynn Dietzel (psychology majors)

Faculty Sponsor: Sarah Torok, Department of Psychology

Sexual Education and the Practice of 'Sexting' in High School and the First Year of College

We investigated the correlation between the type of sexual education an individual received in high school and the prevalence of 'sexting' behaviors in high school and within the first year of

college. ‘Sexting’ is a recently publicized phenomenon invoking social and psychological repercussions. For this study, we adapted questions from a previously conducted national survey. We expect to find that students who received a comprehensive education ‘sext’ more than those who received an abstinence-only education, that students ‘sext’ more in college than in high school, and that students with sexually open peers ‘sext’ more than those with sexually open parents.

Robert Dlwgosh (political science major)

Faculty Sponsor: Richard Dutson, Department of Political Science

Libertarianism and America

For this project I considered the positive and negative outcomes of applying a libertarian model to our current political system. I studied the development of libertarianism from past to present. I then applied its principles to contemporary issues and analyzed the possible outcomes. I found that by attempting to apply libertarian philosophy, one can identify more natural shortcomings of more generally accepted political ideologies. This allows us to see beyond the divide of liberalism vs conservatism, which is really just liberalism in separate guises, and begin to look at other legitimate alternatives to solve our most pressing issues.”

Stephanie Dominick (English: literature major)

Faculty Sponsor: Michelle Collins-Sibley, Department of English

Creating a “True” Story that Never Happened: The Search for Identity in Paul Auster’s The New York Trilogy

My research project looks at the construction of identity through language. I focus on how telling a story automatically creates another story, thus revealing that the “whole” story can never be told. By using detective story conventions in his book The New York Trilogy, postmodern author Paul Auster calls his readers’ attention to the investigation process. Scholarship on Auster discusses that in his trilogy, the contentment of finding a solution is never achieved. Similarly, the stories that compose our identities are intangible; therefore, using language to attempt to answer anything only leads to another question.

Josiah Gantz (biology major)

Faculty Sponsor: Brandon Sheafor, Department of Biology

Thermoregulation and its Role in Reducing Chytrid Associated Mortality

Temperature is a prominent factor in the viability of *Batrachochytrium dendrobatitis*, an emerging amphibian pathogen. Temperatures above 28°C can be lethal to the fungus, while temperatures between 6-23°C increase its fecundity. It is believed that amphibians which have thermoregulatory control, such as tree frogs, are capable of overcoming infection through basking behavior modification. In order to test behavioral responses to chytridiomycosis, two species of tree frogs were examined. Organisms were housed in a clear acrylic tube within which a temperature gradient was established. Tree frog populations were experimentally infected with *B. dendrobatitis*. Organisms were then monitored for behavioral thermoregulatory modification.

Jennifer Gentzel (French and Japanese major)

Faculty Sponsor: Hamako Furuhashi-Turner, Department of Foreign Languages

Understanding Shinto Through the Films of Hayao Miyazaki

Shinto is a religion that has permeated almost every aspect of Japanese society. I will analyze Shinto influence in the animated films of Hayao Miyazaki. Through these films, we can come to a better understanding of Shinto and its place in Japanese society. For this project, I researched Shinto ideas and mythology, how Miyazaki incorporates them into his films and how they are reflected in Japanese society. I have looked specifically at the themes of nature, boundaries, purity, ambiguity and purity of heart and have found that they are prevalent both in Miyazaki's films and many aspects of Japanese culture.

Joshua Gory (Japanese and Spanish major)

Faculty Sponsor: Hamako Furuhata-Turner, Department of Foreign Languages

Translation of Banana Yoshimoto's "Everyday Things"

Translation of a novel requires a great deal of time, patience and acute concentration. I translated the novel, "Everyday Things" by Banana Yoshimoto, a famous contemporary Japanese author, which is a diary of some of her daily life experiences. This involved knowledge of her work in order to translate appropriately and use of various dictionaries. I discovered translation requires interpretation, not just re-writing of text.

Douglas Granger (international studies major)

Faculty Sponsor: Michael Grossman, Department of Political Science

Black and White and Red all over: Propaganda Artwork of the Cold War

This study describes the importance of understanding how citizens of a democratic free society are more susceptible to propaganda than those living in authoritarian societies. This study will compare and contrast the practice of the Soviet Union's use of political propaganda posters with that of the United States. In addition, this study will attempt to examine both the effectiveness and ineffectiveness of propaganda on both the socio-political and psychological culture of the Soviet Union and the United States.

Vincent Gregoric (physics and astronomy major)

Faculty Sponsor: Steve Cederbloom, Department of Physics

Modeling Galactic Collisions

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 created programs that simulate galactic collisions. In this presentation, I will describe the processes behind my own program for modeling galactic collisions, as well as display snapshots of a collision created by my program.

Caitlin Hensley (biology major)

Faculty Sponsor: Brandon Sheafor, Department of Biology

Antimicrobial Peptide Defense Against B.D. in Leopard Frogs

For the past three decades amphibian populations have been drastically declining, in part due to an infectious fungus known as *Batrachochytrium dendrobatidis* which has negatively impacted amphibians across the planet. One way amphibians may fight off infections is through the production of antimicrobial peptides (AMPs) in skin glands. My research investigates AMPs of Northern leopard frogs (*Rana pipiens*) to determine if and how they aid in defense against fungal infection. This experiment examines whether or not AMP levels remain constant, like a

persistent shield on the skin, or whether encountering a pathogen activates or regulates the concentration of AMPs produced.

Matt Hise (middle childhood education major)

Faculty Sponsor: Jeremy Ervin, Department of Education

Content and Performance: A Look into the Quantitative Aspects of Education

The content and performance aspects of the Middle-Childhood Education Senior Culminating Experience (SCE) require an in-depth measurement of the educator candidate's academic achievements. The content aspect requires the candidate to return to previous areas of study based on specialty areas (Language Arts and Social Studies), and subsequently prove competency to teach said topics. The performance aspect coincides directly with the candidate's pre-student teaching experiences. Overall, I was enlightened to know how much the Mount Union College curriculum has taught me, thus highlighting my overall mastery as a future middle childhood educator.

Ryan Hooper (biochemistry major)

Faculty Sponsor: Scott Mason, Department of Chemistry

Synthesis of Alkyl Bismuth Scorpionate Complexes

The research project performed was an inorganic synthesis project attempting to create a Scorpionate ligand with a bismuth metal center. This was accomplished through the manipulation of a trimethyl pyrazolyl borate ligand with various reagents. The results of the study provided a positive synthesis of the desired products.

Jared Hubicsak (mathematics major)

Faculty Sponsor: Ann Ritchey, Department of Mathematics

The Pythagorean Theorem: Its History, Proofs, and Real-life Applications

My presentation is about the Pythagorean Theorem and its history, proofs, and real-life applications. I explored the groups in history that discovered parts of the theorem, and why the theorem is named after Pythagoras. I then investigated the different methods used in proving the theorem that involve the use of geometry, algebra, animation, and trigonometry. Finally, I discovered many real-life applications in which people use the Pythagorean Theorem in everyday life.

Dan Huston (mathematics major)

Faculty Sponsor: Ann Ritchey, Department of Mathematics

The Geometry of Parallel Parking

Why is it so hard to parallel park? Many people find parallel parking very difficult. There are many factors that affect a person's ability to successfully parallel park. In this presentation, I will focus on the physical characteristics of the car and how the geometry of the vehicle affects parallel parking. This geometry includes such characteristics as the dimensions of the car, the turning radius, wheelbase, etc. Through the use of a related article and my own expanded formula, I will compare different vehicles and determine the optimal vehicle and space needed to successfully parallel park.

Amanda Jurkoshek (mathematics and biology major)

Faculty Sponsor: Sherri Brugh, Department of Mathematics

When Does $(a+b)^{-1} = a^{-1} + b^{-1}$?

My work was based on the article “ $(a+b)^{-1}=a^{-1}+b^{-1}$ revisited,” by DesMacHale found in the Mathematical Gazette Volume 85. This article gives a brief overview of the types of algebraic structures for which $1/(a+b)=(1/a)+(1/b)$ does and does not have solutions. It is a common misconception for people to think that $1/(a+b)=(1/a)+(1/b)$ for all numbers a and b, but this is actually never true for real numbers. All mathematicians are aware of this, but some do not realize that there actually are other algebraic structures for which $1/(a+b)=(1/a)+(1/b)$. My research proves and provides examples for when $1/(a+b)=(1/a)+(1/b)$ and when $1/(a+b)\neq(1/a)+(1/b)$.

Lauren Justice (business administration major) and **Gina Rotuna** (mathematics major)

Faculty Sponsor: Ray Posey, Department of Economics, Accounting and Business Administration

What Influences Winning Percentage of Teams in Professional Athletics

Two projects, one using the NBA and one using the NFL, examine whether independent variables, such as salary or defensive statistics, have an effect on the winning percentage of teams. To test this, data from recent seasons was gathered. Multiple regression models were used to test the ability of the previously mentioned independent variables to explain the winning percentages. Certain independent variables were found to be statistically significant, meaning they can be used to explain the amount of NBA or NFL wins and possibly predict winning percentages for future seasons.

Jacquie Ketjen, Amanda Knippenberg, Rachael MacLagan and Jacob Porter

(psychology majors)

Faculty Sponsor: Kristine Turko, Department of Psychology

Music and Mood

Our research project studied the relationship between music and depressed mood. We examined whether the lyrics, the instrumentals, or the combination of both most effectively changed a person’s mood. After a mood induction task, we measured participants’ moods, then again after listening to music. We discovered that the music significantly decreased the depressed mood and that there was no significant difference between conditions.

Virginia Landis (English: writing major)

Faculty Sponsor: Frank Tascone, Department of English

A Bountiful Harvest: A Recipe for Cookbook Writing

From concept to design, the project investigates cookbook writing. The research includes copyright laws, trends in cookbook publishing, and concepts for the layout of a cookbook. With this information, the presenter compiled a text with creative pieces about personal experiences, local events and common local foods to accompany original and family recipes that focus on regional foods for autumn.

Andrew Loudon (biology major)

Faculty Sponsor: Brandon Sheafor, Department of Biology

*Leukocyte Production in Hibernating Leopard Frogs (*Rana pipians*) and its Effect on Susceptability to Chytridiomycosis*

Chytridiomycosis is a globally distributed amphibian fungal disease lethal to many species. In temperate climates, the disease has been found to be more prevalent in spring seasons, possibly due to the weakened amphibian immune system during hibernation. This study will determine how hibernation affects the leukocyte production in leopard frogs (*Rana pipiens*), and how these changes affect susceptibility to *Batrachochytrium dendrobatidis*, the causal agent of chytridiomycosis. This research will increase understanding of how hibernation affects amphibian immune response and has important implications for how best to manage chytridiomycosis in temperate climates.

Jamie Louk (athletic training major)

Faculty Sponsor: Marcelina Higgins, Department of Human

Performance and Sport Business

The Psychological Aspects of Athletic Performance, Injury, and Rehabilitation

Sport activity utilizes the athlete as a whole, incorporating the physical and psychological aspects of participation, injury, and rehabilitation. Psychological factors can help athletes reach their optimal performance level and decrease their proneness to injury before stepping into practice or competition, including their stress levels, self-confidence, and personality. If the proper methods and skills are implemented to assist these athletes, they can become less vulnerable to injury.

Those who assist athletes on a daily basis need to work with them as a whole, addressing their physical and psychological needs with the prevention of injury and their personal rehabilitation process.

Ryan MacLennan (philosophy and English: writing major)

Faculty Sponsors: Frank Tascone, Department of English and Nicole Johnson, Department of Philosophy and Religious Studies

Meditations on Categorization

My project intends to show that categories are limiting, specifically in literature, and relying on them reinforces niches; we end up talking about the boundaries rather than about the art or writing or content. Drawing on Wittgenstein's philosophical model, I examine a series of connected cases taken from literature, the sciences, philosophy, ethics, and music all of which help to build an argument against the primacy of categories and categorization. In short, genres and other categories often cause people to focus more on the meaning given by the categories than to the content of the work itself, especially in literature.

Chris Mark (political science major)

Faculty Sponsor: Angela Smith Alder, Department of Criminal Justice

Education Reform in Ohio: Derolph v. State and its implications

In 1997, the Ohio Supreme Court declared the current school funding system unconstitutional; but little has been done to change the school funding system from its present state. This presentation will address the contentious issue of school funding in Ohio. Analyses of court cases in Ohio, New Jersey, and West Virginia will be included as grounds for comparison. Policy changes made in New Jersey and Massachusetts will also be addressed, along with their adaptability to Ohio. Possible changes to the current system of school funding in Ohio, based on changes made in other states, will be discussed.

Harrison Markel (philosophy major)

Faculty Sponsor: Nicole Johnson, Department of Philosophy and Religious Studies
An Ethical Analysis of Sell v. United States

This project will focus on the ethicality of the United States Supreme Court's decision in *Sell v. United States*, which permitted the government, in certain circumstances, to forcibly administer medication to non-violent pre-trial detainees for the sole purpose of restoring their competency to stand trial. The evaluation of *Sell* will apply several canons of clinical ethics, including autonomy, non-maleficence, beneficence, and justice, as well as any relevant legal arguments. Finally, the analysis will draw a conclusion as to the ethicality of the court's standard for involuntary medication and, if necessary, suggest any ways in which the standard should be modified.

Matthew McCraith (early childhood education major)

Faculty Sponsor: Shawn DiNarda Watters, Department of Education
The "Boy Crisis" in Primary Education: A Male Perspective

Recently, gender differences in the American classroom have become more apparent. Even more surprising, the achievement gap has been overturned, leaving boys as the struggling sex. Much research has been done to compliment or disprove the thought that "boys are in crisis" during their primary schooling years. This article explores a male's perspective regarding the situational context they have found themselves in throughout their educational years. Data was gathered through agreement surveys conducted by males ages 18-24 at Mount Union College. Following analysis, this article concludes that four themes arose as the contributing factors to the downturn in male achievement.

Erin McKinney (religious studies major)

Faculty Sponsor: Nicole Johnson, Department of Philosophy and Religious Studies
One God, One Goal: Judaism, Christianity and Islam United in a Future

The three Abrahamic faiths have many differences between them, some of which cannot be resolved. But, the main common ground that they share is their devotion, worship and belief in One God. As demonstrated in each tradition, God did not create one community but many diverse communities and bestowed on them the duty to love one another. Judaism, Christianity and Islam are not only obligated but called to work towards a peaceful community. This paper discusses this call to peace and also emphasizes the distinctiveness of each tradition and what unique contributions each could add towards a peaceful future.

Jessica Meyer (mathematics major)

Faculty Sponsor: Ann Ritchey, Department of Mathematics
Beauty of the Golden Ratio

The Golden Ratio is an irrational number that people have studied throughout the world. This ratio has been used in architecture to determine desirable dimensions of features of a building. I used the Golden Ratio and six features of the human face to create an equation that measures beauty of an individual. Six male and six female celebrities are studied to determine how our idea of beauty compares with the result of the equation.

Stephanie Monsanto (English: literature major)

Faculty Sponsor: Michelle Collins-Sibley, Department of English

Accident vs. Intention: Explaining the Uncommon Success of Thomas Paine's Common Sense

Through my research, I sought to explain why Thomas Paine's Common Sense had the impact that it did in provoking the American Revolution. Literary scholars and historians have attempted to explain the success of the pamphlet, but most offer a narrow explanation centered on either accidental circumstances or intentional decisions on Paine's part. In my paper, I attempt to weave together the evidence from both sides to provide a more complete explanation of the pamphlet's success. My explanation relies on interconnected historical and literary factors which must all be considered in order to truly understand the text and its significance.

Eric Oliver (religious studies major)

Faculty Sponsor: Nicole Johnson, Department of Philosophy and Religious Studies

"Devil Music" or a "Joyful Noise:" Contemporary Christian Music and Its Role in Christianity Today

Examining today's Christian music is an important way to understand people's beliefs and what Christianity means to them. Although the contemporary Christian music (CCM) industry has grown considerably, various types of CCM have faced criticisms for lack of musical and theological quality. This paper discusses various issues regarding the message, purpose, music, audience, and image of CCM. The paper also examines the context of Christian music history and philosophies of Christian music in order to show what role CCM fulfills and where it is or is not successful, suggesting answers to the various issues it has faced.

Jennifer Peteya (geology and art major)

Faculty Sponsor: Mark McNaught, Department of Geology

Trilobite Paleoecology of the Middle Devonian Tsagaankhaalga Formation Near Tsakhir Well, Shinejinst, Mongolia

In summer, 2009, Paleozoic rocks were studied near Shine Jinst in southwestern Mongolia. My area of study included rocks approximately 387 million years old. The goals were to collect and describe trilobites found within the section and to describe the paleoenvironments they inhabited based on rock and fossil content. This was the first in-depth study of trilobites in Mongolia. The outcrop was measured, rock types were described, and hand samples and fossils were collected in the field. These samples were later analyzed at Mount Union College to gain understanding of their paleoenvironmental significance.

Laura Pollander (biochemistry major)

Faculty Sponsor: Al Gotch, Department of Chemistry

Exploring Biobutanol Production by Anaerobic Bacteria

I investigated biobutanol as produced by two different types of anaerobic bacteria. In this process, conditions such as pH, glucose content, different media, as well as heat shocking and incubation times were examined. The conditions were altered to produce the best growth results for the bacteria as well as to optimize the products. After the products were determined and analyzed, the process of the fermentation that occurred to produce various alcohols, acids, and other byproducts was researched.

Eric Popczun (chemistry major)

Faculty Sponsor: Jeff Draves, Department of Chemistry

Correcting for Pressure Broadening in IR Spectroscopy

Atmospheric spectroscopy has many potential uses, but pressure broadening limits its use. There have been methods used to correct for pressure broadening including measuring broadening coefficients and simulated spectra. While these methods can be used to a certain extent, the permanent answer may be found by examining the relationship between peak width and pressure using a computational program. Starting with a water dimer, the range of the peak positions due to intermolecular spacing were calculated using Gaussian03. With this method, we found a correlation between the intermolecular spacing and the vibrational frequencies calculated, including peak shifts of over 200 cm⁻¹.

Jenna Rinzella (French major)

Faculty Sponsor: Jennifer Hall, Department of Foreign Languages

Albert Camus: No Stranger to Existentialism

Throughout the twentieth century, many French authors, including Albert Camus, explored the irrationality of existence through their fiction. Inhabiting a world full of oppression and mass murder, it is not surprising that Camus would incorporate many existentialist ideas into his works. According to Existentialists, every person is free to make choices and those choices have consequences, but we as individuals must take responsibility for our actions. Camus was keenly interested in issues like the burden of personal responsibility, irrationality, and religion. His works The Plague, The Stranger, The Fall, and The Misunderstanding incorporate these existentialist ideas.

Brittany Rivers (Japanese and psychology major)

Faculty Sponsor: Ivory Lyons, Department of Philosophy and Religious Studies

Marriage in Islam: A Cross-Cultural Comparison

In order to understand the vast and different culture that is the religion Islam, I compared marriage practices of three countries: The United States, Saudi Arabia and India for my honor's project for Introduction to Islam. By comparing scholarly books, articles, journals, newspapers and case studies while also gaining insight from the local Mosque, I was able to compare and contrast the marriage practices of these three countries. Religion does not exist within a vacuum and I found that even though the basic customs were present, culture has shaped the religion and its practices.

John Rosati (history major)

Faculty Sponsor: Louis Rees, Department of History

The Overthrow of the Hawaiian Monarchy, 1893-1894

The January 1893 overthrow of Queen Liliuokalani of Hawaii by a group of pro-American Hawaiians acting in concert with United States troops marked the end of Hawaii's monarchy. My paper examined the political, social, ideological, and economic conditions which led to the overthrow through the analysis of a variety of primary documents, historical monographs, and biographies. I determined that the United States' active role in the coup assured its success.

Stephen Rowe and Jeff Willis (exercise science majors)

Faculty Sponsor: Ron Mendel, Department of Human Performance and Sport Business

Comparison of Popular Nitric Oxide Supplements on Lean Mass in Resistance Trained Males

The purpose of this study was to compare two popular Nitric Oxide supplements (SuperPump 250 & Nitric Shock) on lean muscle mass gains in resistance trained males. Nitric Oxide

supplements are purported to increase delivery of nutrients to working muscle, as well as removal of metabolic wastes from working muscle. Eight recreationally active males, between 18-25 years of age, randomly assigned to SuperPump 250 (n=4) or Nitric Shock (n=4) performed a standardized resistance training regimen, along with supplement ingestion, for six weeks. Body composition and strength measures were performed pre and post training & supplementation.

Jennifer Ryan (mathematics major)

Faculty Sponsor: Gerald Wuchter, Department of Mathematics

The Use of Math in Google's Search Engine

This research project is an attempt to explain the mathematics that is used behind the scenes in Google's search engine technology. Google combines some basic ideas from different mathematical areas to create an algorithm, called PageRank, which ranks web pages to create the order that they appear in search results. With the help of current and previous classes, I analyzed the math used in PageRank. However, I discovered that Google does not rely solely on PageRank, but actually combines PageRank with factors such as content of a webpage, to create overall search results.

Jesse Shamp (political science major)

Faculty Sponsor: Angela Smith Alder, Department of Criminal Justice

Kent School District v. TRUTH: An Analysis of the Supreme Court's Public Forum Doctrine Regarding Public Schools.

The First Amendment stands as a pillar of democracy protecting the rights to practice religion, peaceably assemble, and speak freely. In *Truth v. Kent School District*, the case examined for this research, each of these issues comes under scrutiny. This research delves into standards for free speech and religion in the public school system and, specifically, the constitutionality of the Kent School District's actions against the religious student group TRUTH. This research also provides a clear look at the United States Supreme Court's public forum doctrine and suggests several ways for the judicial branch to elucidate the currently unclear system.

Tia Smith (French and art major)

Faculty Sponsor: Frank Triplett, Department of Foreign Languages

French Translation Project

My French Senior Cumulating Experience project consisted of a translation of the book, *Michelangelo*, by Gilles Néret. I have translated this art history book from the original French text to English. In my presentation I will highlight a few examples of the original French passages and my English translation of such passages. Also, I will discuss some of the specific and general difficulties with translation and why I chose the book for my project.

Kaley Smitley (English: literature major)

Faculty Sponsor: Michelle Collins-Sibley, Department of English

On Beauty: To Be Young, Female and Black? Protagonists of Toni Morrison

Toni Morrison's protagonists in three of her major works (*The Bluest Eye*, *Song of Solomon*, and *Tar Baby*) present a compelling picture of what it means to be young, female, and black in a world where a white, male-dominated society establishes and popular culture promotes a white ideal of female beauty. Morrison's novels examine fundamental issues of race and gender through the struggles of her characters in accepting their inability to achieve such an

ideal. The three works establish a continuum where Morrison first challenges, then rejects the European standards of beauty to redefine it in racially authentic terms.

Ashley Spragale (international business and economics and Spanish major)

Faculty Sponsor: Gregg Courtad, Department of Foreign Languages

Cecilia Valdés: The “Mulata” and Her Impact in Cuba

Cirilo Villaverde captured the intricacies of Cuban culture in his nineteenth-century novel, “Cecilia Valdés.” It focuses primarily on the objectification of “mulatas,” women of color, and reveals how they were portrayed in society through the story of a young, mixed-race woman. The purpose of my research was to explore the impact of the “mulata” on Cuba’s development by examining how Villaverde and other nineteenth-century authors depicted her. I discovered that the image of the alluring “mulata” that was cultivated through literary works was used by the Cuban tourist industry to attract Caucasian males, in particular, to the exotic nation and its products.

Katherine Stugmyer (middle childhood education major)

Faculty Sponsor: Jeremy Ervin, Department of Education

Meeting the Middle School Standards

When completing my Senior Culminating Experience (SCE) in the fall, I was asked to illustrate each middle school state standard by supplying examples of each from the courses I’ve taken throughout my time at Mount Union. This semester, during my student teaching, I worked to find many interactive ways to incorporate these standards into my 5th grade classroom. I used the everyday standards to interest my students. I have found that many of the activities intrigue my students and greatly help them to better understand and remember the material at hand.

Robert Surbella (biochemistry major)

Faculty Sponsor: Scott Mason, Department of Chemistry

Syntheses of Tris(pyrazolyl)methane Ligands Containing Sulfur Compounds

Scorpionate ligands, named for the way in which they attach to metal ions, are among the most widely studied family of metal chelating ligands. The diversity and easily modified nature of the ligand family make them desirable and potentially beneficial in multiple practical applications. The aim of this research was to successfully devise a methodology for the creation of the novel thiophene containing tris(pyrazolyl)methane ligand and investigate its coordination when forming transition metal complexes. In addition to thiophene derivatives, other variations of sulfur containing compounds were investigated and synthesized.

Lexi Tabor (interdisciplinary studies - educational psychology)

Faculty Sponsor: Shawn DiNarda Watters, Department of Education

The Effect of Socioeconomic Status on Parental Involvement

This study, of 78 families with three to six year old children involved in the Supporting Partnerships to Assure Ready Kids (SPARK) program in Alliance, Ohio, was conducted to test whether socioeconomic status has any effect on the level of involvement a parent has in their child’s education. The investigator conducted interviews, made observations, and compared Home Observation for Measurement of the Environment (HOME) scores with socioeconomic status (SES) of each participant. Conflicting evidence was found, with interviews and

observations showing no relationship between SES and parental involvement, and the correlation study confirming that SES does effect parental involvement.

Ian Valverde (Japanese and computer science major), **Gupreet Singh** (information systems major) **and Matt Strumbly** (Japanese and computer science major)

Faculty Sponsor: Clark Archer, Department of Computer Science and Information Systems
Seismographic Data Warehousing and Retrieval

Our project is designed to increase efficiency of the data analysis of seismographic events that have occurred. We have created a stand-alone program that will be run on a user's computer, accessing Ohio seismology stations via an Internet connection to the stations' databases of readout files and displaying them in both visual and text formats.

Jamie Wright (early childhood education major)

Faculty Sponsor: Shawn DiNarda Watters, Department of Education
Fostering Excellence: The Impact of Gifted Programming

This dynamic research study seeks to create a profile of the gifted and talented student academically, socially, and emotionally and use this profile to outline the strengths and struggles of the gifted student. Strong emphasis is put on the broad range of benefits shown in children enrolled in district provided gifted programming. By triangulating documentary and survey data with field observations and interviews, one can begin to understand who the gifted learner is and what specifically he or she needs from an educational setting.

Krista Yankush, Austin Blackwell and Lauren Shaub (exercise science majors)

Faculty Sponsor: Ron Mendel, Department of Human Performance and Sport Business
*Effects of Traditional Aerobic Exercise
Compared to Exergaming on Aerobic Capacity*

The purpose of this study was to examine the effects of traditional aerobic exercise to Exergaming on aerobic capacity. Exergaming is any highly interactive video game that requires movement by the player. It is a new concept that is gaining popularity with limited research to quantify its physiological aerobic effects. Fifteen college-aged males were recruited and divided into three groups: a general aerobic treadmill program, Wii fit aerobic program, and control group. This was a six week study with aerobic capacity (VO₂ max) measured pre & post the six week training period.

Ehrich Zollinger (health and physical education major), **Sarah Cleveland**

(exercise science major), **Amber Kemmerer** (communication major), **Amanda Kohls** (athletic training major), **and Madeline Sofia** (biology major) Faculty Sponsor: Beth Canfield-Simbro, Department of Human Performance and Sport Business

Pay It Forward: Student Philanthropy for the Alliance Community

The "Pay It Forward" grant is a grant provided by The Corporation for National and Community Service. The design of the grant is to give college students experience working with community organizations to put grant money into areas of the community that need it the most. The Community Health Education class is currently in the process of awarding the grant money available to a community organization. This project was designed to give future health educators experience working with the process related to applying for and giving out grant awards.