ABSTRACTS 2014

Kolby Addis  
History  
McKelvey Campus Center Witherspoon,  
Poster Session A 8:30am-9:30am

**Blasting Off: How the Cold War Affected NASA’s Goals**

Historians have had two distinct views on why NASA was created and what its purpose has been. Most historians believe that NASA was created in order to compete with the Soviet Union in space. These historians claim that NASA was used to show third world countries the technological capabilities of the United States. They are supported by the fact that NASA was created in response to the Soviet launch of Sputnik. Another group of historians claim that NASA was always meant to be a cooperative force between the two super powers. Some of the goals listed in important documents related to NASA’s creation and the short amount of time it took the United States to begin working with the Russians after the Cold War ended support this group. The political relationships between the United States and the Soviet Union during the Cold War had a substantial impact on the goals set for NASA and the types of missions the agency planned.

Erin Archer  
International Business  
Patterson Hall 210, 10:15-10:30 AM

**Business Strategy Game**

NOTE: There are six teams listed below, only one team will present at URAC. Winner will not be known until April 24, 2014. Erin Archer, Joshua Auden, Kaylynn Campbell, Spencer Clark, Erin Erdley, Kory Gibbon, Keri Hamilton, Scott Hancak, Evan Hinks, Kenneth Kaufman, Jenna Meighen, Erika Palmer The Business Strategy Game is an online business simulation in which students compete head to head in a virtual footwear industry. Students learned to fine tune the strategic decision making process for all management decisions within their respective companies. Decisions included production standards, plant capacity, pricing strategies, employee compensation and Six Sigma practices, marketing strategies, distribution and logistics decisions, and multiple other decision processes. These decisions mimicked real life practices and have provided students with a unique perspective with regard to what it takes to run a multimillion dollar company.
## Sarah Arena  
**Business Administration**  
Co-author(s): Carrie Milkowski  
**McKelvey Campus Center Witherspoon, Poster Session C 11:30am-12:30pm**  
**Chinese Air Pollution Effects on the United States Economy**

Air pollution in the western United States primarily stems from the vast amount of exports that China produces. Strong winds called westerlies carry pollutants across the Pacific Ocean into California, which is currently the most affected state. With China’s export levels continuously increasing, air pollution is expected to expand farther each year. Our study will compare the willingness to pay for higher-priced American-made products to additional Chinese air pollution. To gain this information, we will distribute surveys to Westminster students. We will also perform a cost-benefit analysis comparing the costs of increased air pollution to the benefits of having lower priced products. We hope to discover ways of improving both air quality and the economy in an efficient manner.

## Jesse Armstrong  
**History**  
**Patterson Hall 210, 9:00-9:15 AM**  
**From The Council of Ferrara-Florence to The Preparations for Siege; Christendom never Unities**

The Council of Florence reached a decree of union between the Orthodox and Catholic Churches on July 6, 1439. This decree of union (Laetantur Coeli) which was to reunite the churches, had secured papal primacy among other issues after Pope Eugenius IV promised, at the request of Emperor John Palaeologus, military and financial help. This help in the possible form of Christian Crusade against the encroaching Ottoman Turks although initially authorized in 1443, was never to reach the Eastern Roman Empire. With the death of Pope Eugenius IV in 1445 and the election of Pope Nicholas V in 1448, Pope Nicholas V never afforded the Eastern Romans the help they so needed. Pope Nicholas V became so mired in political, social, and ecumenical problems in Rome that he was incapable of providing the assistance promised by his predecessor.

## Ryan Avril  
**Physics**  
**Patterson Hall 105, 12:55-1:10 PM**  
**Funding Received from the Drinko Center**

**Toward the ground-based detection of super-Earth exoplanets from Westminster College-minimizing light curve systematics**

We seek to perform a rigorous test of the three prominent methods of taking flat field calibration frames (flats) used for calibration of photometric images. This test will include the methods of twilight flats, flats taken on a flatboard illuminated by incandescent bulbs, and flats that are taken on a Flatman XL electroluminescent panel. We then will take science images of a selected star field, allowing the target stars to drift across the CCD throughout the night. The purpose of a flat is to remove the pixel to pixel variation in the intensity measured by the CCD. The data will be collected in colors, which will help determine color dependence of the variations. Plots will be made of the target star (which we presume to be flat), for each filter, and separate plots will be made for each method of gathering the flats. We will then compare the “flatness” of each plot to decide which method of taking flats reduces the pixel to pixel variation the most.
Kelcey Bailey  
Political Science  
Co-author(s): Teresa Whetstone  
Patterson Hall 105, 12:30-12:45 PM  
**Personal Religiosity & Views of the State: A Comparative Study of Israel and the United States**

Using a survey, our study measures the effect different levels of religiosity have on views on the among college students in Israel and the United States

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Haley Barger  
English  
Co-author(s): Hunter Steinitz  
**Democratization in Iraq: The Failings that Follow the Failure to Follow**

The struggles in the transition to democracy in Iraq over the past ten years can be credited to the disregard for the conditions proposed in transition paradigm theory.

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Kristen Basista  
Neuroscience  
**Concomitant Effects of Ethanol and Amphetamine on Working and Spatial Memory in a Rodent Model of ADHD**

The purpose of this research is to understand the effects of the interaction of ethanol (EtOH) and amphetamine (AMPH) on working and spatial memory in a rodent model of attention deficit hyperactivity disorder (ADHD). Twelve rats were trained on a radial arm maze and the effects of AMPH, EtOH, saline, and the AMPH/EtOH interaction were tested by measuring number of errors. Rodents were given a bilateral medial prefrontal cortex 6-OHDA lesion. Eight rats were trained and retested. The hypotheses were that the number of errors was higher after surgery for each group, and animals injected with AMPH pre-surgery would have the lowest number of errors while ones injected with AMPH/EtOH post-surgery would have the highest. It was found that
the AMPH pre-surgery group had the second lowest number of errors; the AMPH/EtOH post-surgery group had the highest. Besides EtOH, the surgery resulted in more errors post-surgery for each drug condition.

Heather Becker  
Biochemistry  
*Patterson Hall 107, 10:15-10:30 AM*

**Paint Reformulations**

The reason for reformulation of different paints was first due to consumers wanting a more durable paint with less work. When the paint and primer in one came out it became a huge selling point to consumers. Back in 2005 there had been regulations passed to have many products including paint changed to lessen the amount of VOC's. These reasons created changes in the formula of many paints. A comparison of new formulas versus old formulas was compiled. The results showed that with the reformulations there was an evident increase in the volume of solids and product weight as well as some paints with decreased levels of VOC's.

Stephen Bendig  
Broadcast Communications  
*McKelvey Campus Center Witherspoon, Poster Session A 8:30am-9:30am*

**Pittsburgh's Prodigal Sons**

For an emerging band, when do the garage practices end and the stadium tours begin? For The Hawkeyes that question has yet to be answered. Nearly a decade sense their start, they're still struggling to pull themselves out of limbo. This is not a rags to riches story but instead an honest unfeigned look at the struggle and often tedious business life of one of today's fledgling rock bands.

Chelsea Bernat  
Public Relations  
Co-author(s): Maura Hunter  
*McKelvey Campus Center Witherspoon, Poster Session D 1:00pm-2:00pm*

**Research and Advertisement of Samsung Electronics in Sochi, Russia Olympics**

Our research will examine the similarities and differences in the advertising and public relations efforts of Samsung and the Sochi, Russia Olympics. It will look at the research, opportunities, programming and evaluation of the two companies. Their advertising strategies may be similar, but the outcomes are significantly different. The case will provide information about sales, communication, and awareness of advertising with the help of public relations efforts. Our goal is to inform the audience about strategies used by Samsung and the Olympics and how it targets a greater market of valuable consumers.

Harry Bittle  
Financial Economics  
Co-author(s): Rebecca Tomson, Raechel Pusateri, Travis Kelly, Thomas Turnbull, Zachary Galasso, Nicholas David Smith, Jeffrey Seitz  
*McKelvey Campus Center Witherspoon,*
**Poster Session D 1:00pm-2:00pm**

**Westminster College Winter Analyst Program: A Financial Analysis of Douglas Dynamics**

The purpose of the Winter Analyst Program was to give students an experience that simulates a financial analyst internship on Wall Street. The main goal of the program is to develop a well rounded and presentable financial analysis of Douglas Dynamics, a publicly traded company who specializes in the manufacturing and sale of snow removal equipment. The entire analysis included researching current quantitative and qualitative economic factors, analyzing competitors, business strategy strengths/weaknesses, growth opportunities, and recent financial performance. Analysts were split into three groups: A forecasting group who compiled a fully working financial forecast model able to predict future financials of the company based on past and foreseeable performance. A methodology group who used the financial model to compile a bond rating using the standard Moody’s credit rating methodology. And a presentation group who compiled a PowerPoint and full layout for a professional style presentation. Once the analysis was finished the analysis presented and defended their findings to a group of financial professionals. The entire analysis was monitored by a professional financial analyst who currently works for the Moody’s Corporation in New York City. Every aspect of the program simulated a real-life analysis of a publicly traded corporation for students interested in possibly pursuing the field.

Olivia Bonavita
Psychology
McKelvey Campus Center Witherspoon,

**Poster Session A 8:30am-9:30am**

**A Component Analysis of Photo Array Techniques in Suspect Identification**

Eyewitness’ can completely sway juror opinion’s in the courtroom, (Brewer & Wells, 2006) but are wrong 77% of the time (Jones, Williams & Brewer, 2008). For this reason, the current study examined different techniques of photo presentation to eyewitnesses of a crime. Ninety-two undergraduate students participated in a component analysis, which included four groups and six practices based on previous research including photo presentation, backloading, and instructional sets. Identifications were recorded, and a confidence survey was given at the end of the study. It was hypothesized that when sequential presentation was used, participants were told to take their time, and the photos were backloaded, each component would incrementally contribute to the eyewitness’ ability to correctly identify the suspect. Several significant differences were shown between each group on confidence. The conclusion is that the main factor in eyewitness identification is in how the photos are presented.

Rachael Boyes
Business Administration
Co-author(s): Matthew Biamonte

**Patterson Hall 105, 9:50-10:05 AM**

**The Assessment of the UNEP efforts post Ogoniland Oil Spill in Nigeria**

The principal objective of this presentation is to assess the United Nations Environment Programme (UNEP) efforts post Ogoniland Oil Spills in Nigeria. The UNEP’s efforts have been exploited because of Nigeria’s lack of economic resources. Nigeria’s government turned to the UNEP for assistance in the valuation of the economic, environmental, and public health impacts post the Ogoniland oil spill. A main contributor of the oil spills in this region has been from the Shell Oil Company because of their disregard for not only Nigerian oil regulations but
also their own company’s oil regulations. We used a cost-benefit analysis to assess how effective the UNEP’s efforts in Ogoniland have been and if they should continue their efforts in Nigeria.

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<th>Emily Broderick</th>
<th>Neuroscience</th>
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<td>Co-author(s): Brooke E. Mancuso and Rebecca C. Zdilla</td>
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**What Do Westminster College Students Know About HPV?**

For incoming first-year Westminster College students, the 2013 common summer reading was, “The Immortal Life of Henrietta Lacks” – a nonfiction work exploring personal and social reverberations of cervical cancer. Recently, vaccines to prevent human papillomavirus (HPV) infection and HPV-related conditions -- including cervical cancer -- have become available. HPV and HPV-related conditions are significant public health issues, especially among college-age individuals. As first-year students, we were interested in assessing our peer’s knowledge of and attitudes toward HPV and HPV vaccination. We used surveys to determine what Westminster students know about HPV, HPV-related conditions, and HPV prevention. We also sought to correlate this knowledge with student attitudes and behaviors. Our results can be compared with similar studies in other populations, including other college-age groups. This work could potentially find application in on-campus and broader public health efforts.

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<th>Michael Brooks</th>
<th>Biology</th>
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**Early growth and development of the rostrum in paddlefish (Polyodon spathula)**

Paddlefish are native to large river systems of central North America. The rostrum of the paddlefish is not present at hatching, but develops relatively rapidly in young fish. Evidence indicates that this physically significant structure serves important electro- and mechano-sensory functions. Here, we investigate the initiation and pattern of growth of the rostrum. We examined tissue composition in fish from immediate post-hatch to stages with a well-developed rostrum; we describe the histological transition associated with the initiation of growth of the rostrum, the pattern by which hyaline cartilage growth occurs to extend the rostrum, and the physical relationship of the rostrum to the cartilaginous braincase. To explore the regulation and mechanisms underlying rostrum growth we used immunohistochemistry with markers for cellular proliferation, chondrogenesis and neurogenesis.

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<th>Sarah Broskin</th>
<th>Molecular Biology</th>
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**The effects of topotecan on nuclear RanGTP levels in HeLa cells**

Nuclear transport (NT) is essential for the survival of all cells as it relays important signals throughout portions of the cell. The directionality of NT is mediated by a small GTPase, Ran. The mislocalization of Ran and
degradation of the nuclear envelope (NE) are indicators of late apoptosis. In the majority of chemotherapy drugs the progression of apoptosis involves disruption of NT earlier than the breakdown of the NE. Camptothecin, a chemotherapeutic agent, has been shown to induce the two separate events simultaneously. This implicates a mechanism where NT is not directly targeted, but is disrupted due to the absence of the NE. This study aimed to determine the apoptotic mechanism of topotecan, a camptothecin derivative, through the visualization of Ran localization and NE integrity via immunofluorescence in HeLa cells. Results support the idea that topotecan functions to induce the breakdown of the NE which leads to the disruption of the Ran gradient, similar to camptothecin.

**Emily Brune**  
**Psychology**  
**McKelvey Campus Center Witherspoon,**  
**Poster Session C 11:30am-12:30pm**  
Christian Coping influences Stress levels in Undergraduate Students  
This study examined the use of Christian coping skills in undergraduate students’ stress levels. The present study explored the relationships among stress and religious coping in a sample of undergraduate students. The participants included 20 Christian Westminster College Undergraduate Students. To stress the participants, this study used a negative stressor video. Then the participants completed a set of questions assessing their perceived stress before and after the video. The participants were split into two groups. The control group was the group with no coping instructions, and the experimental group used religious coping methods to respond to the video. Religious coping includes prayer, seeking help from God, and trusting God. The study predicts that religious coping lowers stress levels more efficiently than that of general coping strategies.

**Abby Burns**  
**Biology**  
**McKelvey Campus Center Witherspoon,**  
**Poster Session B 10:00am-11:00am**  
Local- and landscape-scale predictors of salamander abundance in areas impacted by natural gas development  
Major alterations of the environment are taking place in west-central Pennsylvania as a result of natural gas drilling. In order to understand its potential ecological impacts, we observed whether relationships existed between Dusky salamander (Desmognathus fuscus) abundance, local habitat metrics and landscape metrics. We selected 10 streams near natural gas wells and established survey plots at locations up and downstream of active well pads. Within each plot we surveyed for presence and abundance of salamanders and measured local habitat metrics within each. We used Fragstats in ArcGIS to quantify forest cover within a 200 m radius landscape surrounding each plot. We used generalized linear models with a Poisson distribution to evaluate the habitat metrics or combination of metrics that best explained salamander abundance. Our results suggest that both local- and landscape-scale metrics are important for predicting salamander abundance.

**Brett Burrell**  
**Chemistry**  
**McKelvey Campus Center Witherspoon,**  
**Poster Session D 1:00pm-2:00pm**  
The Determination of Iron Metal in Water Samples Using Linear Sweep Voltammetry and Flame Atomic Absorption Spectroscopy
Methods of analyzing the quality of water are helpful in determining the amount of trace metals in samples. However, the typical methods tend to be expensive and require tedious sample preparation. Voltammetry is a potential alternative that can be used to determine the concentration of trace metals in samples from reduction and oxidation peaks represented by the measurement of current as the potential energy varies in a voltammogram. In this work linear sweep voltammetry and flame atomic absorption spectroscopy (AA) were used to determine the concentration of iron metal in sample taken from Westminster College's Lake Brittan. The present work is evaluating if voltammetry can offer equivalent if not better performance compared to flame atomic absorption spectroscopy.

Tyler Call
English
Patterson Hall 207, 9:00-9:15 AM
Faculty Sponsor: Vaccaro
Funding Received from the Drinko Center

Are You Experienced: Social Experience in Beloved and Frankenstein
Sidone Smith and Julia Watson, in their book Reading Autobiography: A Guide for Interpreting Life Narratives, define experience as “the very process through which a person becomes a certain kind of subject owning certain identities in the social realm, identities constituted through material, cultural, economic, and psychic relations.” Because this experience teaches humans how to relate to one another, it is a key aspect of life. This experience feels natural because humans slowly gain it through the process of growing up. Parental figures play a key role in the gaining of this experience. Mary Shelley’s Frankenstein and Toni Morrison’s Beloved each feature a unique character that has not had a childhood. Both the Creature and Beloved come into the world as adults. Once here, they go through a very similar set of circumstances. The key here is that neither of these characters have the life experience, the way of thinking, that comes from growing up. They are children in adult bodies.

Megan Carlton
PreK-4 ECE/PreK-8 Spec Ed
McKelvey Campus Center Witherspoon, Poster Session C 11:30am-12:30pm
Faculty Sponsor: Dr. Alison DuBois

Attitudes Towards Individuals with Disabilities
The purpose of this research study seeks to determine if a camp counselor’s overall attitude/perception of individuals with disabilities changes after working at a weekend camp with these individuals. Data will be collected on participants’ attitude/perceptions toward individuals with disabilities. The decision to use a camp setting was made due to the participants’ increased exposure and opportunity to work closely with individuals who have disabilities on a weekly basis. Although my main focus is determining whether participants’ attitudes have changed over time, this study will also look into factors that may have had an effect on participants’ attitudes.

Taylor Casteel
Psychology
McKelvey Campus Center Witherspoon, Poster Session C 11:30am-12:30pm
Faculty Sponsor: Sandra K. Webster

Then and Now: Early Memories vs. Recent Memories and Their Effect on Emotion
This study examined the emotions of participants when early memories, occurring in a participant’s childhood, or recent memories, occurring within the past year, were recalled to consciousness. Positive emotions and
negative emotions were measured when the memories were recalled. Participants (N=20) were asked ten
tables regarding the recall of early memories and recent memories. Each memory recalled was based on an
every-day event that could have happened in a participant’s childhood and recent past. They then rated their
emotion of each early memory or recent memory based on a Likert scale, ranging from strong positive emotion
to strong negative emotion. I hypothesize that the recall of early memories, occurring in childhood, will produce
a more positive emotional response in the participants than the recall of recent memories, occurring within the
past year. This research can apply to future studies of the recall of childhood memories and its effect on
emotion in the present.

Laura Chambers
Christian Education
Patterson Hall 210, 12:55-1:10 PM
Crucifixion Explained To Children: What is Appropriate to Share?
The crucifixion of Jesus Christ, as portrayed in the Gospel literature, is a graphic and violent event in Christian
history, and is remembered by the church during a typical dark Maundy Thursday service or Good Friday
service. Lights are turned off, sad music is played, and participants can become emotional while reflecting on
the idea that God sent Jesus Christ into the world to die for the sins of humanity. This presentation will answer
a practical question, fundamental to Christian faith development; What is appropriate for Christian educators,
or even parents, to share about Jesus’ crucifixion on the cross to elementary students that will be cohesive with
their spiritual and emotional development? Theology and psychological research of child development together
creates a solution, centered on developing a lesson plan that highlights the resurrection over death by Jesus,
son of God.

Gregory Clark
Mathematics
Patterson Hall 108, 9:00-9:15 AM
A Push in the Right Direction: A New Technique for Coloring the Integers
Given S, a 1 x n tile colored red and blue, we wish to cover an interval of finite length with copies of S such
that each cell in that interval is covered by a red cell in S. In this talk we explore the relationship between the
coloring of S and the number of tiles needed to cover a given interval. In particular, we explain why a tile with
only three red cells needs at most two copies to color five consecutive cells red.

Gino Colella
Biology
McKelvey Campus Center Witherspoon,
Poster Session C 11:30am-12:30pm
Neuromast density and eye degeneration in developing blind cave tetra,
Astyanax Mexicanus
Research looked to identify critical points in time where the logistic degeneration of eyes and advancing logistic
growth of neuromasts in Astyanax mexicanus correlate with one another over developmental time. Densities of
neuromasts were compared to relative eye size of corresponding fish. Logistic analysis suggested tetr
expressed exponential, yet inverse, rates of eye degeneration and neuromast formation. Neuromasts appeared
to be in initial stages of reaching maximal densities, suggesting that when eye degeneration ceased, neuromast
densities cease advancement too. This pattern could be due to genetic pleiotropy controlling both processes.
The development of neuromasts had a negative correlation with relative eye size on the operculum and on the
orbital tissues as independent regions, yet quadratic polynomial analysis suggests that orbital tissue neuromasts develop sooner than operculum neuromasts, which suggests separate developmental processes coding each neuromast collection.

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<th>Brittany Colosimo</th>
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The effects of 5-fluorouracil on nuclear RanGTP levels in HeLa cells

Chemotherapeutic drugs are used to induce apoptotic cell death or halt proliferation in cancer cells. Our chemotherapy of interest is 5-fluorouracil (5-FU), a fluoropyrimidine that has been used to treat cancer for 50 years. We sought to determine the effect of 5-FU on nuclear function & structure during apoptosis. We used propidium iodide testing to determine when apoptosis occurs after treatment with 5-FU. We then performed immunofluorescence for Ran, a GTP-binding protein that is necessary for nuclear protein transport, & nucleoporins, proteins found at the nuclear envelope, at time points leading up to the disruption of the nuclear membrane. We found that 5-FU mislocalized Ran & thus disrupted nuclear transport before the breakdown of the nuclear envelope. Specifically, cells exposed to 5-FU for 4.5 hours showed Ran mislocalized to the cytoplasm whereas the nuclear membrane breakdown did not occur until 6 hours of exposure of 5-FU.

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“We Don’t Negotiate with Terrorists.' 'Who Said Anything About Negotiating?” A Content Analysis on Terrorism Films: Depicting How Terrorism is Portrayed in Todays Popular Media

Prior to September 11, 2001, sociologists showed little interest in terrorism. My research is a qualitative content analysis on today’s popular terrorism films. I watched and coded seven different films, of which four of them were fiction and the other three were nonfiction. Within those, out of the four fiction films, two of them were filmed before 9/11 and the other two were filmed after 9/11. And out of the three nonfiction films, one of them were filmed before 9/11, while the other two were filmed after 9/11. Many different themes emerged out of the research, such as, “the terrorists,” “good guy vs. bad guy,” “the middle man,” “reality vs. fantasy,” “the method,” and “the purpose.” And lastly the research consisted largely between the differences between the nonfiction and fiction films, as well relating the films to a larger society as whole, for example, how terrorism is depicted in the films and relation to how terrorism is viewed as in society in the real world.
them were fiction and the other three were nonfiction. Within those, out of the four fiction films, two of them were filmed before 9/11 and the other two were filmed after 9/11. And out of the three nonfiction films, one of them were filmed before 9/11, while the other two were filmed after 9/11. Many different themes emerged out of the research, such as, “the terrorists,” “good guy vs. bad guy,” “the middle man,” “reality vs. fantasy,” “the method,” and “the purpose.” And lastly the research consisted largely between the differences between the nonfiction and fiction films, as well relating the films to a larger society as whole, for example, how terrorism is depicted in the films and relation to how terrorism is viewed as in society in the real world.

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**Enactus Presents: Financial Literacy Among Juvenile Delinquents**

Enactus worked on a project this year called Financial Literacy Among Juvenile Delinquents. We did this project at George Junior Republic, which is an all-boys institution in western Pennsylvania, in the town of Grove City, PA. It is one of the nation’s largest private non-profit residential treatment facilities. George Junior Republic serves to house, school, and discipline 400 high school-aged boys from troubled backgrounds. We presented to the students on topics that consisted of: debit cards, banking, how to write a check, budgeting, savings, credit cards, and taxes. And the last day we played an interactive game to review all the information. Throughout the project, we gave the students a pretest, two quizzes and a post test for measurement purposes. The average grade for the pretest was around a 45%, the average grades for the two quizzes were both around 80%, and the average grade for the post test was about an 82%, almost doubled from the pretest.

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<th>Carissa Conway</th>
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**Developing a Compliant Hazardous Laboratory Waste Management Program for Westminster College**

Waste generation is an unavoidable component of the experimental process. Responsible waste management protects those working in the laboratory, their colleagues and the surrounding community. A review of documentation, disposal policies and common procedures at Westminster College’s Chemistry teaching labs was performed to assess the appropriateness of current practices. Additionally, a full understanding of the college’s wastewater discharge system and an assessment of its compliance with environmental regulations were required. A lack of attention to educating students about proper waste disposal was identified. In response, an instructional video on waste disposal was created specifically for use in Westminster College chemistry lab courses. To augment the video, lists were placed by trash receptacles and laboratory sinks for students to positively identify hazardous wastes. These tools will help Westminster to remain in compliance with both federal and local regulations.
Jessica Cook  
Psychology  
McKelvey Campus Center Witherspoon,  
Poster Session A 8:30am-9:30am  
**The Effects of Mood on Manipulative and Non-Manipulative Interrogation Techniques**  
Due to numerous false confession cases that have led to incarcerations, the focus of this study was determining how manipulative techniques produce a false confession and what role emotion plays in the suspect believing one’s own confession. The Kassin(1997) model for a false confession was used in a sample of 80 undergraduate students. An interrogation model for producing a confession was used. The independent variables were mood and interrogation technique style, with the dependent variable being the number of tactics used to produce a false confession. Results indicated no significant impact, but trends in hypotheses were noted. Mood was significantly effective on having the participant believe he/she actually committed the crime. The implication shows that all techniques used in interrogation are manipulative, and that staying in a positive mood during an interrogation leads to one being less likely to believe the false confession.

Veronica Corcoran  
Physics  
McKelvey Campus Center Witherspoon,  
Poster Session C 11:30am-12:30pm  
**The Ising Model**  
Ferromagnets exhibit magnetism when the spin of all of the electrons contained within it point in the same direction. However, if the spin states of the electrons are then randomly oriented the material is not magnetic. This can be caused by heating the material to its Curie point. Once it reaches this temperature the magnetization should decrease quickly. Simulations of the heating of cobalt, gallium, and neodymium can show where the Curie point for these ferromagnets are. The Ising model is the simulation used to find the probability of a ferromagnet being in a state of magnetization. We will use this to find the Curie point for each of the three ferromagnets listed.

Colleen Costello  
Sociology  
McKelvey Campus Center Witherspoon,  
Poster Session D 1:00pm-2:00pm  
**Gender and Sexual Harassment: How Hegemonic Masculinity and Intersectionality Shape Perceptions**  
The study of the effects of gender on sexual harassment perceptions has important implications due to repercussions associated with it. Interviews were used to answer the question: What factors shape perceptions of workplace sexual harassment of men and women? This article gives an analysis as to why people have certain perceptions of sexual harassment, and looks at gender as one factor shaping perceptions. The results of this research indicate that participants have different views of how they would respond to sexual harassment, and what is and is not sexual harassment. These findings were analyzed within intersectionality and the idea that sexual harassment is a gendered expression of power. Gender is one of many factors that work together as intersections to shape perceptions. These factors can include gender, age, company status, and socioeconomic status. The findings were used critically, to attempt to improve the current sexual harassment
Recovery of samarium oxide from scrap SmCo magnets using solvent extraction and precipitation stripping

The majority of the world's production and distribution of rare earth metals is controlled by China. Therefore, recycling or repurposing the rare earths we already possess is ideal. This research focuses on the recovery of highly pure samarium oxide from scrap samarium cobalt magnets. This is done using solvent extraction with organophosphorous extractants in hydrocarbon diluents as the organic phase and nitric-acid-digested magnet solutions at pH of 3 as the aqueous phase. Preliminary research has shown that Ionquest-801(mono-2-ethylhexyl-(2-ethylhexyl) phosphonic acid) is the most effective organic extractant for this process. Once the samarium has been extracted from the aqueous layer, precipitation stripping with oxalic acid is used to strip the samarium as an oxalate from the organic layer. Once the oxalate is recovered, it is calcined to yield highly pure samarium oxide. This precipitation stripping process reduces the environmental burden of standard metal recovery techniques.

The environmental impact of golf courses in the southwest United States

We looked at several factors to determine the environmental impacts of golf courses in the southwest region of the United States. We examined water allocation, fertilizers, pesticides, and the cultivation of land. We compared these findings to that of other regions in the United States to show the contrast in environmental impacts between areas. The levels of water consumption on a single golf course in the southwest United States can reach to over 100,000 gallons per year in comparison to almost 0 gallons per year consumed in other regions of the United States. The climate of the region is not conducive to the sustainability of many golf courses and the culture of the area needs to be changed. The southwest region of the United States needs to find a viable alternative to maintaining golf courses or reduce the number of golf courses in the region to try and offset the environmental damage caused by these courses.

Music Modes and How People Feel Emotions

This experiment studied how music modes are related to emotion. There are two different songs that both have different modes, one is major and the other is minor. The major and minor modes are expected to produce emotions like happiness, or sadness. Twenty college students, ten men and ten women, were randomly assigned to each mode with five participants of each gender. Each participant was given a pre-test to rate current emotional state, then after the pre-test the participants listened to one of the two songs, either major or minor, and then were given a post-test to rate how they feel, using the Positive and Negative Affect Scale,
after they have listened to the song. It is predicted that the scales show that the participants will feel sadder after listening to the minor song or feel happier after listening to the major song. This prediction may be because major modes are more popular to listen to and have a tendency for people to feel happier while the song is playing.

Selena Dasari  
Neuroscience  
McKelvey Campus Center Witherspoon,  
Poster Session D 1:00pm-2:00pm  
Effects of Anxiety and Optimism on Distractibility by Deviantl Stimuli
This study assessed the effects of an anxious or positive mood induction on susceptibility to distraction. In a between studies design, 18 college students were induced with one of the three emotions: anxiety, optimism, or neutral emotion by reading one of three articles about the future of job markets. Participants then performed a task of responding odd or even to a number presented for 180 trials. 20 percent of the trials included a distractor stimulus. A longer response time during the distraction trials compared to the typical trials would indicate greater distractibility. The anxiety-induced group is expected to show the greatest distractibility, while the optimism-induced group is expected to show the least distractibility.

Alyssa DeSantis  
Psychology  
Patterson Hall 106, 9:00-9:15 AM  
Tony Cragg: Blending Art and Science
British-born artist Tony Cragg started his career working in a laboratory and continues to incorporate those early, scientific interests into his sculptural work over 40 years later. Looking at just five of his pieces, Cragg shows use of binary code, genetic principles, taxonomy, the theory of evolution, and the electromagnetic spectrum. Through his work, Cragg interweaves traditional art mediums and scientific theories, which seemingly have little in common with one another. In the process, he builds a dialogue between them, making the impact of his scientific influences even greater through his artistic commentary. He explores how technologies should/do impact artists, what types of material hold value and why, and the substances that comprise larger objects, among other themes. Tony Cragg is known as one of the most influential, European artists in modern art due in part to this approach.

Alyssa DeSantis  
Psychology  
Patterson Hall 207, 12:55-1:10 PM  
The Effects of Diversity on Emotional Intelligence and Creative Performance
Creativity is beneficial for collaboration within groups, and emotional intelligence (EI) may indicate positive group interaction. This study evaluated how diversity affects group members’ creativity, along with perceived performance and satisfaction with a task. Homogenous groups were predicted to score higher on creativity, EI, satisfaction, and performance. Using a between groups design, 33 students, ages 18-23, were randomly assigned, in triads or dyads, to either a diverse (6 total) or homogenous group (7 total) using false feedback. The Wong and Law Emotional Intelligence Scale measured EI, independent coders rated group creativity on the task, and self-report data evaluated performance and satisfaction following the task. Significant data were not found for the main hypotheses. Group size was significantly, negatively correlated with performance but there was no relationship between diversity and group productivity.
Music's Effect on the Perception of Personality and Demographics

This study investigated whether stereotypes about different music genres are projected onto persons. Participants (12 men and 12 women) will be randomly assigned to either the controlled condition which is hearing only a person reading a prewritten script, or is assigned to one of the two experimental conditions where they hear the same script read by the same person mixed with background music; either pop music or rap music, and light crowd noise. Participants were then given a short survey which will ask to rate the person in the recording on ten positive and ten negative personality descriptors and predict demographic information. It is hypothesized that the participants who are assigned to the experimental group rap music will rate the person with more negative stereotypes, in the pop music group will rate the person with more positive stereotypes, and the participants in the controlled condition, assuming they will deem the person in the recording as typically neutral.

The effect of increased intracellular calcium on the localization of the catabolic subunit of telomerase, TERT, in HeLa cells

In cancer cells, telomeres are repaired by telomerase to avoid senescence. Aerobic respiration creates an increase in ROS that cause telomerase reverse transcriptase (TERT) to exit the nucleus. Without nuclear TERT, telomerase cannot repair telomere ends ultimately leading to senescence. One effect of increased ROS is an increase in intracellular calcium. We attempted to mimic this ROS induced increase in calcium levels by administering Thapsigargin to HeLa cells to determine if an increase in calcium levels alone would cause TERT to exit the nucleus. Immunofluorescence was used to visualize fluorescent intensities of nuclear TERT. We predicted the drug would cause TERT to exit the nucleus, ultimately leading to the onset of cellular senescence. Results indicate that administration of the drug causes a significant decrease in nuclear levels of TERT. Findings from this study could provide a potential method to induce cellular senescence in cancer cells.

Determination of Manganese by Linear Sweep Voltammetry Using Screen-Printed Electrodes

The objective of this research was to compare the results presented by both voltammetry and flame atomic absorption spectroscopy for the determination of manganese ions in solution. Voltammetry is a type of electrochemistry used for determining concentrations of a specific analyte in solution. This project used linear sweep voltammetry with screen-printed electrodes to determine the concentration of manganese in standard solutions. The voltammetry varies the potential energy within the solution and at a very specific potential the manganese ions in solution are reduced and plated onto the electrode. This plating causes a change in current
and is directly proportional to the concentration of manganese ions in solution. Flame atomic absorption spectroscopy uses sample introduction pump system (SIPS) to take precise dilutions of a 5 ppm stock solution. The absorptions recorded for each solution are directly proportional to the concentration of manganese in solution.

Domenic DiSanti  
Biochemistry  
Patterson Hall 106, 9:25-9:40 AM  
Analysis of Trace Metal Concentrations in Hair by ICP-MS: An Environmental Health Study

The chemical analysis of hair samples has already been applied in a few important ways, such as identifying exposure to high levels of harmful metals, and drug testing. Yet, while these are important applications, there have not been significant amounts of research done looking at either the biochemical pathways of metal assimilation into the hair, or linking high or low levels of trace metal content in hair to diseases or other medical conditions. The reasons for analyzing hair samples' trace metal content is because concentrations of metals are thought to be representative of the of the concentrations of metal in blood, making hair a non-invasive way to assess metal concentrations in the body. Building off primary literature and former Westminster students, this study intends to refine past methodologies to make them more effective and to further explore correlations between trace metal content and environmental health.

Megan Donaldson  
PreK-4 ECE/PreK-8 Spec Ed  
Patterson Hall 107, 1:45-2:00 PM  
Diversifying Dynamics: The ever-changing roles of the public school educator

Diversifying Dynamics: The ever-changing roles of the public school educator is a qualitative action research project. The research is conducted using a semi structured interview with elementary school teachers in a public school setting. The interview probes the areas of experience with trauma material in the classroom, the education received on trauma materials prior to beginning their first professional job, and their knowledge of and confidence with appropriate response protocol. The goal of the study is to examine the education pre-service teachers receive in relation to need in the field. Research shows the importance and impact of appropriate response and intervention when presented with trauma material. This study examines the role of colleges in the preparation of pre-service educators to handle trauma material in their classroom.

Melissa Dubrawka  
English  
Patterson Hall 208, 9:25-9:40 AM  
The Love Songs of Esther Greenwood and Edna Pontellier : Mad Girls and Their Art

Literature acts as means to express the realities of life, such as the idea of the mad young woman who drives herself "insane" for her art. Literary works that best demonstrates this concept are The Bell Jar by Sylvia Plath and The Awakening by Kate Chopin. Both are feminist texts, written by women who experienced their own forms of mental illness, which seek to glorify the female artist, even as she descends into madness. They emphasize that female artists are more likely to fall into the classification of "mad" because of the societal pressures on gender. These two novels tell the universal story of dynamic women who are trivialized and
reduced to "crazy." They are so much more, though; Edna and Esther of each of these texts are unconventional heroines who defied the norms and paid with their sanity. They are women of yesterday, tomorrow, and with any hope—not the future who still struggle with these pressures and representing themselves as artists and voices of their generation.

Sarah Ferguson
Environmental Science
McKelvey Campus Center Witherspoon,
Poster Session C 11:30am-12:30pm

What type of Tea contains a higher level of beneficial salicylates?
It is known that organically grown plants contain a higher level of salicylates than do natural grown plants. Salicylates are beneficial to the body in that they aid in decreasing the risk of colorectal cancer and inflammatory disease. A diet high in fruit and vegetables or a low dose aspirin regimen will help increase the amount of salicylates in the body. The objective of this experiment was to test three types of tea and determine their concentrations of salicylates. I predicted that the organic green tea would have the highest level of salicylates. To test this, different types of tea were boiled, a stock solution of sodium salicylate was prepared, standard dilutions of the stock solution were prepared, test samples of each tea were prepared and the absorbance’s of each were measured. After testing, it was found that the 100% natural green tea contained the highest level of salicylates.

Danielle Figueroa
Chemistry
McKelvey Campus Center Witherspoon,
Poster Session B 10:00am-11:00am

Effectiveness of Microscale Chemistry
Microscale chemistry is a relatively new laboratory practice in which the scale of the experiment is decreased to save time, resources, and money. The effectiveness of this practice was measured by preforming two existing microscale laboratory protocols to find correlations between results. It was concluded that microscale chemistry is effective, but lacks basic analytical accuracy needed for chemistry laboratories.

Jaimie Flaherty
History
McKelvey Campus Center Witherspoon,
Poster Session B 10:00am-11:00am

The Critical Year of 1905: A Shift in Beatrix Potter’s Writing after the Death of Her Husband, Norman Warne
London, the home of Beatrix Potter for a majority of her life, the place of publication of her earlier books, and the residence of her parents, no longer served Potter after the death of her husband, Norman Warne in 1905. She did not want to be reminded of her loss. Potter tried to escape London and her emotions as she began practicing traditional farming, and immersed her energy into writing new books which focused on Hill Top Farm. Research conducted in London at the Victoria and Albert Museum confirms the thesis above and Potter’s motivation to move to the countryside. Previous authors have argued that Potter gained inspiration from the countryside from her spirituality, emotions, and from watching animals in the countryside. Analysis of all of Beatrix Potter’s letters (published in Judy Taylor’s book, Beatrix Potter’s Letters, 1989) from 1900 to 1910 revealed evidence of Potter’s feelings after her husband’s death and the effects of her move to the Hill Top
Jessica Flowers  
Neuroscience  
Faculty Sponsor: Dr. McGovern  
Funding Received from the Drinko Center  

McKelvey Campus Center Witherspoon,  
Poster Session C 11:30am-12:30pm

The Effects of Amphetamine and Ethanol on Condition Place Preference in an Animal Model

This study investigated the reinforcing effects of AMPH and EtOH using conditioned place preference. Sixteen male Long Evans Hooded rats were assigned to AMPH, EtOH, AMPH+EtOH or saline drug groups. On testing days EthoVision software recorded the time spent in each chamber: preferred, neutral or non-preferred. The study tested the hypothesis that rats would prefer individual drugs compared to dual administration. This was done by comparing within groups the time the rats spent in the non-preferred chamber in the pretest and posttest. Results showed the amount of time spent in the non-preferred chamber did increase from pretest to posttest, independent sample t tests did not show the difference to be significant. A repeated measures ANOVA for all drug groups showed that the difference between the AMPH and saline groups time spent in non-preferred chamber approached significance. This shows a trend that AMPH, EtOH and AMPH+EtOH do have reinforcing effects when compared to no drug.

Elizabeth Frambes  
PreK-4 ECE/PreK-8 Spec Ed  
Co-author(s): Abby Buckholt, Emily Scharf, and Lauren McClinton  
Faculty Sponsor: Dr. Klassen Endrizzi  
Funding Received from the Drinko Center  

Patterson Hall 205, 12:30-12:45 PM

The Family Photo Project

Seven pre-service teacher researchers, working at Campbell Elementary School, OH., created the Family Literacy Photo Project, designed to assist the student teachers and Kindergarten and first grade families in discovering different ways families read with children besides books. The pre-service teachers sent home disposable cameras, asking children to "Catch yourself reading." The resulting photos were sorted into categories of print based on Ken Goodman's four functions of literacy (1986). Discoveries from the Photo Project helped the pre-service teacher researchers to understand these families' values and literacy beliefs in greater depth, compared to the small perspective seen during school hours. The student teachers' vision of literacy expanded, enabling them to consider more purposeful literacy experiences at school.

Ryan Francis  
Economics  
Co-author(s): Marcus Gurgiolo  
Faculty Sponsor: Rotua Lumbantobing  

McKelvey Campus Center Witherspoon,  
Poster Session C 11:30am-12:30pm

Non-Indigenous Snake Species in the Florida Everglades and Their Economic Cost

Millions of exotic snakes have been imported into Florida for people own as pets over the past several decades. As the snakes get too large and they cannot take care of them anymore owners set them free in the Everglades never thinking how much this would affect them and the ecosystem. The snakes survived and their population...
skyrocketed. Years later Florida is now dealing with a major problem with the invasive snakes. They are preying upon the indigenous animals including several endangered species. Millions of dollars have been spent to stop the spread of the snakes. We hope to learn what the state and local governments are doing to fix the environmental problem created by the snakes and which method is the most cost effective. We plan to use cost/benefit analysis to look at several proposed solutions and determine which is the most economically feasible. We will acquire as much data as we can on the environmental affects, economic costs, policies, and laws in Florida.

Katherine Francois  
Chemistry  
McKelvey Campus Center Witherspoon,  
Poster Session C 11:30am-12:30pm  
Optimization of a Lewis Acid Catalyzed Interrupted Formal Homo-Nazarov Cyclization

The Nazarov and homo-Nazarov reactions show potential as synthetic routes for creating natural products. Although many forms of carbocation trapping have been done with the Nazarov, trapping with the homo-Nazarov has not been explored. The goal of this research was to optimize the conditions for an interrupted formal homo-Nazarov reaction. Various conditions were explored involving catalysts, concentrations, solvents, and temperatures.

Madeline Frech  
Psychology  
McKelvey Campus Center Witherspoon,  
Poster Session D 1:00pm-2:00pm  
The Effect of The Unrealistic Thin Ideal on the Self Image of Women

The proposed study evaluated the adverse effects of unrealistically thin images on the self-perceived body image of college students. College women (N=18) were randomly assigned the task to review unrealistically thin photographs, untouched original photographs, or both images side-by-side. Each group was presented two photos of two different models for analysis of overall attractiveness: beauty, waist size, skin smoothness, and bust and butt attributes. The participants then completed a Stunkard and Ideal Body Image assessment for evaluation of perceived body image compared to society’s ideal body and healthy expectations. The group with the unrealistic photoshopped picture is expected to experience a harsher view of self than the control and original picture group. This could be caused by an unrealistic standard of the female body set by the media.

Molly Fuchs  
History  
McKelvey Campus Center Witherspoon,  
Poster Session C 11:30am-12:30pm  
Irish Hearts and Irish Hands: The Formation of The Irish Culture in Nineteenth-Century Pittsburgh

In the nineteenth century mass amounts of Irish immigrants flooded to the United States in search of new lives. Particularly in the latter part of the century, the Irish immigrants comprised a large majority of Pittsburgh, Pennsylvania's inhabitants. The city was in the midst of an industrial boom and called for cheap immigrant labor. The Irish left the eastern port cities en route to the "Smokey City" and answered the calling. What shaped the social lives of those Irish immigrants in late nineteenth century Pittsburgh? Through the
National Labor Tribune and The Irish Pennsylvanian newspapers, written in the time period in Pittsburgh, provide the primary source base to prove that the Pittsburgh environment affected those lives of the Irish immigrants. The place of origin of Irish immigrants living in Pittsburgh combined with their employment as laborers in the late nineteenth century yielded the creation of the unique, close-knit Irish society in Pittsburgh.

**Sarah Fugate**  
Mathematics  
*Patterson Hall 110, 1:20-1:35 PM*  
**Fractals and Fractal Dimension**  
According to John Hart, a fractal is a recurring geometric pattern or figure. Fractal X was created using two functions: a scaling function and a rotation function combined with a translation. Once Fractal X was created, the fractal dimension was calculated. Throughout this presentation, the techniques and process of calculating the fractal dimension of Fractal X will be discussed.

**Haley Gabor**  
Chemistry  
*McKelvey Campus Center Witherspoon, Poster Session D 1:00pm-2:00pm*  
**Analysis by x-ray diffraction supports microwave-assisted hydrothermal synthesis of yttrium barium copper oxide**  
Products from a hydrothermal synthesis technique for yttrium barium copper oxide (YBCO), a high-temperature superconductor, were analyzed using powder x-ray diffraction (XRD). YBCO was first synthesized using solid state and precipitation techniques and were then used as a basis for developing a microwave-assisted hydrothermal method. The length of time in the microwave and temperature, were varied to attempt to produce YBCO as YBa2Cu3O7. This structure is important as it allows for superconducting properties. When YBCO only has five oxygen atoms per formula unit, it has insulating properties. The change from the orthorhombic structure with seven oxygen atoms per formula unit to the tetragonal structure with five oxygen atoms is key in determining conducting versus insulating properties. XRD was used to assess purity as well as to characterize the structure of YBCO in each sample.

**Jessica Galanski**  
PreK-4 ECE/PreK-8 Spec Ed  
Co-author(s): Janelle Grasso, Julia Adams, and Alaina Oprean  
*McKelvey Campus Center Witherspoon, Poster Session B 10:00am-11:00am*  
**Inquisitive Cube**  
Two sections of Math 110, under the direction of Dr. Pamela Richardson, collaborated to create a modular origami model of a Level 2 Menger Sponge, which is categorized as a 3-dimensional fractal object. This object is classified as a fractal, and is essentially defined as "an object that exhibits self-similarity". Fractal structures can be found in everyday life within objects such as plants and the human body. As a class, we were able to build a fascinating fractal known as the Menger Sponge using 3,456 business cards donated by Westminster faculty and staff members. This assignment was strictly an origami project, which means that the cards were assembled with folds using no adhesives to hold the structure together. The Menger Sponge is a surprising mathematical concept due to the fractal’s complexity; after an infinite number of steps, the integrated
algorithm used to create this fractal will give the Menger Sponge an infinite surface area, yet the object has no volume.

**Jason Garay**
**Communication Studies**
**Patterson Hall 205, 9:50-10:05 AM**

**How Does Computer Mediated Communication Affect the Interpersonal Relationships of Children?**

In today’s educational environment, one of the key developmental social skills that should be taught to children is how to communicate effectively with other classmates and teachers. This is a necessity because in today’s technologically advanced world, children are becoming more susceptible to the side effects of too much technology in their lives, thus causing them to have poorer communication skills and interpersonal relationships. The overuse of technology can be seen in a child’s involvement with computer mediated communication on devices, such as, laptops, iPhones, and iPads. This is a major concern that needs to be dealt properly because how children are influenced by technology at a young age will affect what type of person they will become as adults and how they will function in society. If more parents and teachers see the dangers of too much technology in a child’s life, they will realize why limiting its use is beneficial for their interpersonal relationships.

**Sean Gibbon**
**Business Administration**
**Co-author(s): Joseph Glennon**
**Patterson Hall 105, 10:40-10:55 AM**

**Where’s My Water? An Economic Look at the Current California Drought**

The purpose of our study was to analyze the economic impact of the drought in California and the established water policies, as well as policies recently enacted. Receiving less than 50% of the state’s historical rainfall average, this drought could be the worst in California’s history. The current weather is set to bring about more forest fires, and threatens wildlife, in addition to agriculture, which makes up 6% of California’s economy. By gathering information from various government agencies, we conducted a cost-benefit analysis of the legislation passed to help improve the water shortage situation as well as some of the policies that helped get them to their current situation. Compared to the alternative, it looks as though the emergency bill passed by the state legislature will bring relief to many, but may not adequately address the persisting problems that prevent a sustainable water policy.

**Michael Girata**
**Mathematics**
**Co-author(s): Brittany Majors**
**Patterson Hall 107, 12:30-12:45 PM**

**A Chemist and a Statistician Walk into a BAR (Biochemistry And Regression)**

Undergraduate chemists currently use basic calibration curves to identify concentrations of analytes in solutions. Chemometrics offers a way to analyze multiple analytes instead of one at a time. A common problem with this method is the correlation of components. Principal components analysis (PCA) offers a way to transform data into a set that can model the original data, yet has no correlation. Current undergraduate labs do not use chemometrics or PCA due to a lack of interdisciplinary understanding. One goal of our work is to bridge the vocabulary gap between statisticians and chemists for more efficient collaboration. Another goal of
our project is to develop a PCA template that undergraduates could apply to their own chemometric model.

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**A Reflection on the 2013 Midwest Band and Orchestra Clinic**

We will be presenting about our individual experiences at the Midwest Clinic. This includes explanations of the various performances and presentations we attended.

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**The Effect of Self-Construal Diversity on Group Performance in a Hidden Profile Task**

The purpose of this study was to examine the effects of diversity in self-construals on group performance. One hundred seventeen undergraduate participants were primed with an interdependent or independent self-construal, or received no priming. In groups of three, participants made a decision about the best of four candidates to hire for an organizational vacancy. Groups received either a full information or hidden profile set. It was predicted that groups primed with interdependent self-construals would correctly identify the optimal candidate more often, solve the hidden profile task more often, and have higher confidence ratings than groups primed with an independent self-construal. Results indicate that those who received a complete information set correctly identified the best applicant more often than those who received a hidden profile information set. This was due to the amount of shared and unshared information discussed during group discussions.

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**Analysis of Actual vs. Perceived Consumption: A Study of Student Water and Electricity Usage at Westminster College**

The purpose of this study was to compare and contrast the actual and perceived consumption of water and electricity of the average Westminster College student. Additionally, we compared the average consumption of water and electricity by men and women who attend Westminster College. Most students do not comprehend how their actions have an effect on the environment and the economy. Previous research has focused on urban settings, rather than a rural, campus environment. A between groups analysis of variance was used to compare men and women’s perceived and actual consumption of water and electricity. We predicted women would use more water and men would use more electricity on average, per person. This study is allows students to better understand their influence on the environment as an individual and as a society. Through a more comprehensive understanding of our daily use of water and electricity and how it impacts the environment, we can better regulate ourselves in the future.
Identification of cell type producing IL-1B in the brain of male Fischer 344 rats after restraint stress

Interleukin-1β (IL-1β) is an inflammatory cytokine that is produced during times of infection and acute stress. IL-1β is known to affect mood, cognitive functions, and behavior. Chronic exposure to stress has potential to result in disorders such as depression, anxiety, and post-traumatic stress disorder (PTSD). A previous study in our lab found IL-1β in the motor cortex, the hypothalamus, the amygdala, and the caudate putamen in the brain of male Fischer 344 (F344) rats. The purpose of this study was to identify the cell type that produces IL-1β in the brain of F344 rats after restraint stress. Dual-label immunohistochemistry was used to compare stress vs. non-stress for the presence of IL-1β, and to identify the cell type producing it. The cell type producing IL-1β was suggested to be neurons. Knowing the cell type that is producing IL-1β is neurons helps to advance the field of psychoneuroimmunology and provides locations in the brain that can help further research in diseases.

Cyberknowledge: A Study of the Doctor-Patient Relationship and Doctors' Presentation of Self with the Increasing Influence of the Internet

The doctor-patient relationship has become a widely discussed topic with increasing consumer-centered culture. However, the influence of the Internet on patient medical knowledge has not been adequately addressed. This research addresses the issue of the Internet informed patients and their relationship with their doctors, with special attention on the doctors' presentation of self. Specifically, doctors' use of impression management is examined by way of in-depth interviews.

Research and Reconstruct: America's Top Brands

A public relations case study highlights the areas of research, objectives, programming, and evaluation while examining potential opportunities to gain consumer & brand loyalty. Through the use of qualitative & quantitative research, we have developed a comparative case study to examine consumer trust related to Target, Coca-Cola, & Carnival Cruise Lines. The research tactics used include annual reports, news articles, content analysis, surveys, focus groups, & customer feedback blogs. From this research, we have investigated strategies & tactics that each company has used to prevent greater crises. Recently, each of these companies experienced a loss of trust and credibility with its target audience. We've compared & contrasted each company's issues. Target, Coca-Cola, and Carnival Cruise Lines each face threats to their brand and reputation.
This research is significant because it illustrates the importance of obtaining consumer trust & proper brand management within a company.

**Taylor Heinrich**  
Broadcast Communications  
*McKelvey Campus Center Witherspoon*,  
*Poster Session B 10:00am-11:00am*

**Going The Extra Yard**

Going The Extra Yard  
This documentary follows Toby Bonitz as he chases his dream of playing football after graduating from Westminster College. Most NCAA DIII college football players hang up their pads after they graduate. Others refuse to let go of the game. The 5-8 180 pound speedy running back embarks on a journey to join the Oil Region Rampage semi-professional football team located out of Meadville, PA. Bonitz graduated with a degree in biochemistry. He has bills and student loans to pay, but instead of finding a job in a lab, he is pursuing future glory days on the football field. But how long can he keep chasing the dream?

**Andrew Henley**  
History  
*Patterson Hall 106, 10:15-10:30 AM*

**Inmates or Patients?: Changes within Dixmont Hospital**

Dixmont Hospital, a former insane asylum located outskirts of Pittsburgh, was once the home of the western Pennsylvania insane. From its founding in 1862 to its closing in 1984, the hospital underwent major changes, especially between the early 1900s to the 1920s. During this period, Dixmont began referring to inmates as “patients,” and began treatment using solitary instead of padded cells. This research will elaborate on these changes and explain how they marked a new era and affected the community’s view of the institution. Previous to these changes, the surrounding community had a negative view on Dixmont Hospital, but perceptions evolved parallel to evolution of the hospital’s policies.

**Kirsten Hess**  
Soc-Criminal Justice  
*Patterson Hall 205, 9:25-9:40 AM*

**The "Ideal" Probation Officer: Officer Typologies & Relationships**

Probation, a major component of the correctional system in the United States, serves as an alternative to incarceration. While the number of those under community correctional supervision grows, few studies have been conducted focusing on perceptions of these probation officers, as well as the quality of their relationships. Past studies conclude that the outcome of the offender relies heavily on the relationship built with their probation officer. The current study consists of nine probation officers from a small probation office in Pennsylvania. With these nine probation officers, typologies are constructed that explain the methods of supervising the offenders. Through these typologies and past research we then gain a better understanding of the "ideal" probation officer and how to lessen re-offending.

**Margaret Hess**  
English  
*Patterson Hall 106, 1:20-1:35 PM*

**To Live Like Mosquitos**

As humans we interact with each other, but we also interact with our environment. This is how we know; we do our best learning by first observing. Our interpersonal affairs help define the world around us, but, perhaps
more importantly, our relationships make sense because of our engagement in the natural world. The simple but crucial practice of observation can develop into poetry, and my collection, “To Live Like Mosquitos,” uses my own observations to present an understanding of life, through rocks and trees, faith and love. In my attempt to articulate the metaphors I have found, unnamed other(s) enter, several voices surface, and moods vary as seasons cycle.

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<th>Brittany Heydon</th>
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<td><strong>Patterson Hall 107, 10:40-10:55 AM</strong></td>
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<td><strong>BREAKING THE MOLD: LOVING YOUR BODY IS THE NEW FASHION TREND</strong></td>
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<td>Social media and advertising has encouraged low self-image among young women and men for years. Through body image and self-empowerment campaigns, there has been a definite stance against this current social issue. For my case study, I highlighted the campaign executed by American Eagle Outfitters, Inc. under their Aerie subsidiary lingerie brand. American Eagle Outfitters, Inc. has recently launched their Aerie Real Campaign, where they have discontinued digitally retouching their models and have encouraged positive self-image through social media tactics. Through my research such as content analysis, survey, SWOT analysis and online observation of published materials and customer feedback, I analyzed Aerie’s campaign effectiveness towards their target audience and designed recommendations to increase the Aerie Real Campaign’s success.</td>
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<td><strong>Patterson Hall 110, 12:30-12:45 PM</strong></td>
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<td><strong>Rational Numbers and Their Decimal Expansions</strong></td>
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<td>The topic of this talk is the decimal expansions of rational numbers. We clarify when rational numbers produce terminating decimals and the exact point at which termination occurs. We show why other rational numbers have eventually repeating decimal expansions and describe the properties of their period and prefix. An application of Abstract Algebra aids in the process of determining the period of a unit fraction of a prime denominator. We present this method as well as others that help identify the period of a rational number when given the prime factorization of the denominator. Despite much research and the methods we suggest in this talk, determining the exact period of a unit fraction with a prime denominator still remains a very difficult problem within the realm of number theory.</td>
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<td>Co-author(s): Jason Frawley</td>
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<td><strong>McKelvey Campus Center Witherspoon, Poster Session D 1:00pm-2:00pm</strong></td>
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<td><strong>NASCAR and the Environment</strong></td>
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<td>This project will look at variables such as fuel consumption, emissions, noise pollution, and the sport’s carbon footprint to estimate how each of these aspects are detrimental to the environment. By using sources from both reputable, environmental and NASCAR websites, results will illustrate the cost in both monetary value and environmental degradation. Early research suggests that NASCAR’s fuel consumption and emissions are sizable threats to the environment; however, they are both correctable. For example, different fuels could be used or the sport’s season could be shortened. It would be interesting to compare the high fuel consumption and emissions versus the slight economic benefit that comes from a race for the host area. Hopefully the results will</td>
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Teaching from the Shadows: Migrant Tutoring in Rural Pennsylvania

Public schools are increasingly becoming more linguistically diverse. Teachers need to be prepared to meet the needs of the ELL (English Language learners) in the classroom. The opportunity to tutor migrant farm workers and their families in English provided the catalyst for future teachers to apply their classroom knowledge as well as examine their own beliefs and expand their world view. In this study, researchers conducted six structured interviews of pre-service teachers who participated in tutoring migrant workers in English as an education course requirement. After an analysis of the interviews, researchers will present three emergent themes from the data. This presentation will culminate with the implications of tutoring experiences for pre-service teachers and how it impacts their beliefs and future teaching.

A Remote-Operated, Arduino Controlled Vehicle for Atmospheric Data

The use of remote-controlled vehicles in scientific fields is growing rapidly because of their unique capabilities to operate in dangerous environments and to efficiently perform cumbersome tasks. As remote-controlled vehicles become more affordable and more common, they are being utilized more for scientific studies, and many of these uses involve collecting data. Two areas where remote data collection can be beneficial are locations that have high radioactivity, and along natural gas pipelines, which are prone to leaks. To successfully collect data in these locations, I have constructed a remote-controlled vehicle that is able to send values of natural gas and radiation to the user in real-time. The vehicle is controlled by Arduino micro controllers, features a wireless video feed to the user, and also has a GPS module. The data that is collected can also be stored with the location so that graphs of the data can be made.

The Cost-Benefit Analysis of Tidal Power as an Alternative Energy Resource

The topic that we chose to use for our project was the upcoming alternative energy source tidal power. This is a way of transferring the energy that is produced from waves and currents into electricity. With an energy source like this the economy could avoid using hazardous energy sources such as nuclear power plants. These tidal power units utilize the same technology as windmills, except with water. The turbines are virtually harmless and don’t impact the marine life significantly. We plan to use a cost-benefit analysis to determine the benefits of tidal power, specifically in high hurricane areas. We hope to learn more about the process of harvesting the power as well as how it can be beneficial to the economy in the future. We plan to look closely at the research that is currently being done in the Bay of Fundy in Canada because of its hurricane like currents. We also plan...
to compare tidal power to other alternative energy sources in order to see if it is more efficient.

**Neuroph Studio Extensions for Westminster College Students**

In this work the open source Neuroph Studio project was extended to include generation of cluster diagrams. In addition, the simulations and tutorial material in Exercises in Rethinking Innateness A Handbook for Connectionist Simulations were adapted for Westminster College students using Neuroph Studio in their coursework. We will discuss the algorithms used to generate the cluster diagrams, integration into Neuroph Studio, and walk through one of the adapted exercises.

**Neural Network Hidden Layer Size**

Artificial neural networks (ANN) are computational models inspired by the brain. This talk will give a brief overview of ANNs including how networks learn through weight changing schemes and details about network configuration. Determining the optimal number of nodes in the hidden layer(s) of an ANN is a very difficult problem. Rules of thumb have been determined, but there is not an exact way to decide this. We seek to find the optimal hidden layer size of a data set by simulating training ANNs with 2-7 nodes in the hidden layer to a mean squared error of 0.01 and 0.1. We then eliminate some of the training data and use it as test data to test the network for overtraining. We find the optimal hidden layer size is 3 nodes when using a mean squared error of 0.01 or 0.1. We also found a correlation between very large and very small connection weight values for networks that did not train to the desired mean squared error and got stuck at the same mean squared error.

**Bridges to Reading: Family-Teacher Literacy Conversations**

Children succeed in school when their families and teachers collaborate (Ratcliff, 2009). Bridges to Reading: Family-Teacher Literacy Conversations, is a family-school partnership program developed by pre-service teachers and faculty at Westminster College, interested in learning how to bridge the literacy gap between children's home and school lives. During the 2013-14 school year, Greek, Polish, Hispanic, and African American Kindergarten families met four times with Kindergarten teachers and Westminster students and faculty, in order to open the lines of communication. Pre-service teachers shared informational newsletters, discussed literacy resources in homes, and demonstrated the importance of reading at home and in the community. An initial analysis of observational notes from conversations revealed the vital place of each child’s first learning partner, emphasizing the importance of family-school collaborations.
The Effects of Acute, Yohimbine-Induced Stress and Ethanol on Impulsivity in Rats

The current study was designed to examine the effects of acute ethanol and yohimbine-induced stress on impulsivity in a rodent model. Eight male and eight female rats were used. All rats experienced each condition: yohimbine, ethanol, yohimbine+ethanol combined, and a control condition receiving saline. Every rat in all conditions was tested in a delayed reinforcement task. Impulsivity was measured by response accuracy in this task measured by choice made by the rat. It was predicted that impulsivity would increase in this condition order: control, ethanol, stress, stress and ethanol. It was also predicted that males would be more impulsive than females in all drug conditions. There were significant effects of drug and impulsivity increased as hypothesized. There was no sex by drug interaction. These results reinforce previous knowledge of the relationship between stress and alcohol intake and their effects on impulsivity.

“Eight in the Gate”: Organizational Impact of Prisons on Correctional Officers’ Perceptions of Their Job

Even though prison populations in Pennsylvania are slightly declining there is still a need for prison staff. This study examines interviews with correctional officers, investigating ways that the organizational structure of prison has impacted their personal and professional lives. A respondent driven sample was used in which seven in-depth interviews were conducted with Pennsylvania Department of Corrections employees. Four themes emerged: appeal to corrections, interactions with staff, the role of management, and perceptions of organizational impact on the participants. The interactions that the participants had with staff were varied but were important to the work environment atmosphere. The participants in this study explained their dismay toward management, seeing it as a “necessary evil.” While none of the participants expressed a previous desire to become a correctional officer; however, they each felt that the job had a permanent impact on their lives in some way.

Growth Rate and Protein Expression of Closterium Moniliferum Cultured in Hydraulic Fracturing Fluid

Hydraulic fracturing releases natural gas held in shale formations beneath the earth’s surface. Water, proppant, and chemicals are injected during multiple stages in a process known as ‘fracking.’ The injected fluid is later collected. While underground, the fracking solution absorbs high concentrations of the heavy metals barium (Ba) and strontium (Sr). If an industrial accident were to occur, these elements pose hazards to the environment and human health. Phytoremediation, or the use of plants to stabilize or reduce contamination, has been successfully used in removing industrial chemicals. Phytoremediation could be used to alleviate hydraulic fracturing contamination without expensive active removal of hazardous material. Closterium moniliferum, a ubiquitous bright green alga, selectively forms crystals composed of SrSO4 and BaSO4 in its
vacuoles. In this study, the growth rate of C. moniliforme and protein expression in the presence of Ba, Sr, and fracking fluid were assessed.

| Nicole Karpinsky | Faculty Sponsor: Dr. Sandra K. Webster |
| Psychology       | Funding Received from the Drinko Center |
| *Patterson Hall 207, 9:50-10:05 AM* |
| **Do Fear Appeals Increase Persuasion? Influence of Loss- Versus Gain- Framed Diversity Messages** |

| Reuben King | Faculty Sponsor: Mrs. Natale |
| Public Relations | |
| *Patterson Hall 108, 12:30-12:45 PM* |
| **Miami Dolphins and Bullying in the NFL** |

Bullying has often been associated with school children and young teens for years. Many organizations and companies have started anti-bully campaigns to get rid of this problem. However, the Miami Dolphins have recently encountered their own bullying problem this past season in their locker room. The NFL has never dealt with a situation like this. Qualitative and quantitative research was conducted to identify what steps the Miami Dolphins public relations department has taken to resolve this problem. As well as possible recommendations for the organization going forward. Keywords: Bullying, Miami Dolphins, NFL, Public Relations

| Amanda Kowalczyk | Faculty Sponsor: Dr. Ann Throckmorton |
| Biology | |
| *Patterson Hall 205, 10:15-10:30 AM* |
| **The effect of socioeconomic factors and race on the pervasiveness of Human Immunodeficiency Virus in Sub-Saharan Africa and the United States** |

The HIV epidemic in the United States has been a source of panic since it began in the 1980s. It is important to learn as much as possible about HIV so scientists can determine what action to take to slow its transmission. Although HIV can be spread via any blood-to-blood contact with an infected individual, it is most commonly spread through sexual contact. Several factors, such as pre-existing sexually transmitted infections and race, increase an individual’s chance of contracting HIV. However, other factors such as poverty, education level, and healthcare availability are also correlated with the number of cases of HIV in an area. It is unclear which factors are causational and which merely coincide with cases of HIV. This project used GIS mapping software to study relationships among HIV risk factors and the number of HIV infections in an area. Results were used to make conclusions about the significance of various risk factors on the transmission of HIV.

| Ashley Lance | Faculty Sponsor: patricia clark |
| History | Funding Received from the Drinko Center |
| *Patterson Hall 108, 10:15-10:30 AM* |
| **Fallout: Complications for Veterans in Post-Vietnam America** |

This paper discusses the hardships faced by Vietnam veterans upon returning home from war. Issues focused on include: physical and emotional trauma, the American anti-war sentiment, and poor distribution of benefits from organizations such as the Veterans Administration. Research was conducted using census data, government statistics, journal articles, first hand accounts, documentaries and letters from veterans. Research showed that many soldiers returned home with physical disabilities and deformities. Many veterans also
returned home with Post-Traumatic Stress Disorder because of the harsh conditions faced in Vietnam and the loss of friends and fellow soldiers. Soldiers also faced issues receiving benefits due to red tape in government organizations and lack of information about services.

**Jacquelyn Leach**  
Psychology  
*McKelvey Campus Center Witherspoon,*  
*Poster Session A 8:30am-9:30am*  
*It’s Written all Over Your Face: Detecting Deception through Measures of Pupillary Response and Periorbital Temperature*  
This study examined measuring pupil dilation and periorbital temperature of participants as reliable indicators of deception. Participants were 64 Westminster College undergraduate students. The participants were assigned to either a deceptive or non-deceptive condition in a between subjects design. They were asked to either lie or be honest during a mock job interview. Measurements of pupil size were recorded with the Rosenbaum pupillometer and measurements of periorbital temperature were recorded with the BIOPAC SS6L fast response temperature probe. The results of the study revealed no significant difference between pupil dilation or periorbital temperature in participants regardless of the condition to which they were assigned. The implications of this study suggested that pupil dilation and periorbital temperature are not reliable indicators of deception, and that further research of these methods is necessary. Keywords: deception, periorbital temperature, pupil dilation

**Tyler Lucas**  
Physics  
*Patterson Hall 210, 10:40-10:55 AM*  
*Orbital Resonance in Saturn's Rings*  
Resonance, most often thought about in systems such as waves or springs can also happen in larger systems such as planetary orbits. This orbital resonance causes objects at certain intervals, with respect to the object causing the resonance, to move out of its original orbit. This can most easily be seen in Saturn’s rings, more specifically the Cassini division. This division is Saturn’s largest gap in its rings and is caused by orbital resonance with its moon Mimas. The purpose of this research is to determine the dependence of mass on orbital resonances; specifically, the number of resonances and the size of those resonances. This was done by using a program called Universe Sandbox to simulate the formation of Saturn’s rings with various masses of Mimas. By doing this I was able to find how mass affects orbital resonance in Saturn’s rings, an effect that can be extrapolated to larger planetary systems.

**Connor MacKenzie**  
Mathematics  
*Patterson Hall 105, 1:20-1:35 PM*  
*Applying Topological Concepts of Geographic Information Systems to the Digital Plane*  
Applying the concept of intersection values to the digital plane and examining the consequences of this can produce some interesting results. This research will produce a method to help construct closed sets, and a partial characterization of the closed sets in the digital plane will be provided. Many results in the digital plane will mirror those of Franzosa and Egenhofer, however the digital plane will help to add some clarity. The relationships that correspond to each intersection value will be examined under different restrictions on the sets.
Effects of common insecticides, carbaryl and diazinon, on zebrafish (Danio rerio) embryo cardiovascular development

The objective of this study was to determine the effects of carbaryl and diazinon on the development of zebrafish embryos. Rainstorms trigger the flow of insecticides to nearby water supplies, harming aquatic organisms. Carbaryl and diazinon are both organophosphates and acetylcholinesterase inhibitors, so we were interested in finding out if the combination of chemicals would have a stronger effect on the embryos when compared to the chemicals alone. Literature has shown carbaryl and diazinon to decrease heart rate and increase pericardial edema in zebrafish and medaka. Overall effects were observed and recorded every 24 hours post fertilization up to 96 hours. We observed decreased heart rate, increased pericardial edema, delayed hatching, decreased body length and spinal deformities for the three treatment groups when compared to the control of system water. An ANOVA verified insignificance between the combination of chemicals and the chemicals alone.

The effects of silencing a biofilm suppressor gene using RNAi in Staphylococcus aureus

Staphylococcus aureus is a virulent, pathogenic bacterium that causes infections by adhering to medical instruments and implants. The purpose of this experiment is to gain a better understanding of the mechanics responsible for biofilm formation to assist further research in inhibition of biofilm from S. aureus, ultimately reducing the number of infections in patients. Infections are the result of a plaque-like growth called biofilm, which uses specific proteins, such as polysaccharide intercellular adhesion protein (PIA), to form antibiotic-resistant colonies. The PIA protein is coded for by the intercellular adhesion operon (ica operon). Upstream, icaR regulates transcription of the ica operon by repressing production of the PIA protein and ultimately the amount of biofilm. To understand more about the mechanisms behind biofilm formation, we attempted to suppress expression of icaR with siHybrids that stimulates a type of RNAi mechanism in prokaryotes. We measured biofilm production and gene expression of icaR and the first gene of the ica operon (icaA). Biofilm production was measured by staining with crystal violet and then measuring the amount of stained biofilm by spectroscopy. Gene expression was measured by RT-qPCR (real time quantitative polymerase chain reaction) and gel electrophoreses. There was no significant difference between biofilm growth of the control group and the siHybrid treated group. There was no significant difference expression of icaR between the control and the siHybrid treated samples. The siHybrids did not successfully silence icaR; thus, no observed increase in biofilm production.
Stochastic noise in photometric observations of hot Jupiters

The goal of this project is to model the three types of stochastic noise in the lightcurves produced at Westminster College Observatory (WCO), in order to lower lightcurve noise and detect smaller planetary transits. WCO is one of several observatories that belongs to the KELT-North photometric follow-up team. While KELT is optimized for wide-field synoptic surveys, WCO is optimized for narrow-field multi-band observations at higher photometric precision. This lightcurves obtained at WCO help to verify exoplanetary candidates and enable better fits to exoplanetary system parameters. Noise models are important for understanding how well the equipment and methods that WCO uses are working; they are also important for determining what changes might be made to improve noise in the lightcurves produced. Lowering noise is important because it would allow WCO to detect shallower transits (super-Earths with small host stars) in addition to the transits that can currently be detected.

Sarah Mauri  
Physics  
McKelvey Campus Center Witherspoon,  
Poster Session D 1:00pm-2:00pm  

Dynamical Models of Love Affairs

The goal of this project is to explore dynamical models involving coupled ordinary differential equations that describe the amount of love or hate displayed by individuals in a romantic relationship through time. The story is that Romeo is in love with Juliet, but the more that Romeo loves her; the more Juliet wants to run for the hills. But if Romeo backs off, then Juliet begins to find him strangely attractive. Romeo echoes Juliet: he warms up when she loves him but grows cold when she hates him. The lovers can each have one of four different romantic styles: eager beaver, narcissistic nerd, cautious lover, or hermit. An eager beaver, for example, is encouraged by his/her own feelings, as well as the other person’s feelings. This project explores the linear system of two individuals, and then explores love triangles, and finally includes the effect of nonlinearities, which are shown to produce chaos.

Celeste McBride  
Business Administration  
Patterson Hall 108, 1:20-1:35 PM  

Business Strategy Game

NOTE: There are six teams listed, only one will present at URAC. Winner will not be known until April 24, 2014. Haley Casuccio, Jill Davis, Jason Frawley, Nathan Herrmann, Jeffery Huff, Travis Kelly, Celeste McBride, Nathan Moot, Jaclyn Staudacher, Anthony Tielenni, Alicia Warne. The Business Strategy Game is an online business simulation in which students compete head to head in a virtual footwear industry. Students learned to fine tune the strategic decision making process for all management decisions within their respective companies. Decisions included production standards, plant capacity, pricing strategies, employee compensation and Six Sigma practices, marketing strategies, distribution and logistics decisions, and multiple other decision processes. These decisions mimicked real life practices and have provided students with a unique perspective with regard to what it takes to run a multimillion dollar company.

Gregory McClelland  
Music Education  
Patterson Hall 208, 1:20-1:35 PM
Lessons in Love and Loss

I will present pieces from my Senior Capstone recital. The topics of the pieces include infatuated love, head-over-heels love, star-crossed love, desire, loneliness, and love that is bought. Come on out and enjoy some musical selections from Schubert, Fauré, Donizetti, Sondheim, Aaron Copland, and Kurt Weill. Patrick - I'll need to be in the chapel and I'll need the piano. And I was curious, if you have enough time, could I have a 30 min time slot? If not, no worries, but I was just curious. Thanks!

Lauren McElhaney
Public Relations
Co-author(s): Celeste McBride
McKelvey Campus Center Witherspoon,
Poster Session B 10:00am-11:00am

Cost-Benefit Analysis of Hydraulic Fracturing on Westminster College's Campus

Hydraulic fracturing, commonly known as fracking, has become a prominent issue across the nation and particularly for our local college community. This research examines both the positive and negative aspects of fracking and its potential impacts on Westminster’s grounds. In order to determine if the costs of fracking outweighed the benefits, we completed a cost-benefit analysis using both historical cost estimations, as well as, valuation estimates from the results of a contingent valuation survey given to Westminster students. We found that while there are many determinable costs and benefits associated with fracking, the costs and benefits to which future generations will be subjected to remains undetermined. Our results can help the Westminster community make a more informed decision regarding the allowance of fracking on Westminster’s land.

Brett McElroy
Physics
McKelvey Campus Center Witherspoon,
Poster Session A 8:30am-9:30am

The Tatooine Scenario
Brett McElroy URAC Abstract The Tatooine Scenario The simulation of the Tatooine Scenario is a variation on the Three Orbiting Body Problem, in which one planet is able to sustain a stable orbit around two orbiting stars. Using he computer program VPython, it is possible to simulate the orbits of these celestial bodies, and vary their initial conditions in order to determine the most stable conditions. Most of these simulations will consist of a Mars to Neptune size planets orbiting F (white), or G class star (yellow), and an M (red dwarf), or G class star. The goal is to create a stable orbit in the habitable zone of these stars, by varying the initial conditions of each orbiting body.

Briana McMahan
Psychology
McKelvey Campus Center Witherspoon,
Poster Session A 8:30am-9:30am

The Effect of Extraneous Factors on Client Ratings of Psychotherapy Satisfaction
This study evaluated extraneous factors that influence a client’s rating of psychotherapy satisfaction. Ninety
undergraduate participants were randomly assigned to one of six groups that exposed them to one extraneous factor while receiving a psychotherapy intervention—a direct relaxation audio recording. They indicated their satisfaction with the recording on the Client Satisfaction Questionnaire 8. It was hypothesized that individuals exposed to the friendly experimenter condition would be more satisfied than those in the control group, and those in the control group would be more satisfied than those in the rude experimenter, 10 minute wait, noisy environment, and disorganized environment conditions. There were no significant differences in satisfaction ratings among the conditions. This may mean that satisfaction ratings are an accurate indicator of outcome. Results also show that the manipulation was ineffective, possibly from inappropriate conceptualization of the factors.

**Samuel Mellon**  
**Physics**

**Co-author(s): Laura Perez (National Radio Astronomy Observatory)**

**McKelvey Campus Center Witherspoon,**

**Poster Session D 1:00pm-2:00pm**

**Study of the Outflow and Disk surrounding a Post-Outburst FU-Orionis Star**

Young stars form at the centers of giant swirling disks of gas and dust. Some of this material will form planets, the rest will be accreted onto the star. Episodes of massive accretion cause young stars to have violent outbursts of radiation known as FU-Orionis flare. Thus, characterizing FU-Ori events is critical in understanding the evolution of young, low-mass stars. One such FU-Ori object is known as PP 13S*. By employing 3mm interferometric observations of the PP 13 region, collected by the Combined Array for Research in Millimeter-wave Astronomy (CARMA), we studied and characterized the continuum and molecular line emissions from this object. With these observations, the source of the known large-scale outflow was determined and new information about the double star system PP13 Na and PP13 Nb was obtained. Although the accretion disk remains undetected in the gas emission, future modeling could help provide constraints on the properties of PP 13S* and its outflow.

**Laurel Michalek**  
**English**

**McKelvey Campus Center Witherspoon,**

**Poster Session B 10:00am-11:00am**

**Orbital Stability of the Circumbinary Hot Jupiter Kepler-34b**

Kepler-34b is a circumbinary Hot Jupiter orbiting two nearly identical G class stars. This planet was discovered by the Kepler Space telescope via the transit method. From observing the planet, we have been able to place constraints on its orbital parameters. A common theory for the formation of Hot Jupiters is that they form further away from their host and then migrate inward toward their host. This three body system provides an interesting case study of the stability of the orbit as a function of the semi-major axis of its orbit and the initial speed. Probing the stability of different orbits may lead to evidence of the path that Kepler-34b took as it migrated toward its host system. Numerical simulations of the orbit with different initial conditions will illustrate stable orbits in the form of an attractor, revealing this orbital path if it exists.
The Trees of Middle-Earth: the Myth of Their Inherent Evil

Sarah Mohn
Psychology
Patterson Hall 107, 9:50-10:05 AM
Faculty Sponsor: Dr. Mandy Medvin

Inhibitory Control and Working Memory Predicts Helping Behaviors in Preschool Children

Christopher Molnar
Chemistry
McKelvey Campus Center Witherspoon,
Poster Session B 10:00am-11:00am
Faculty Sponsor: Dr. Francis Barrios and Dr. Sarah Kennedy

Determination of the Solubility of 4-Vinylphenol in Aqueous Media and Identification of Precipitate

Sara Monts
Biochemistry
Co-author(s): Rebecca Bradnam
Patterson Hall 208, 9:00-9:15 AM
Faculty Sponsor: Dr. Boylan & Dr. Barrios
Funding Received from the Drinko Center

Sucrose and Sucralose as Teaching Tools

Sara Monts
Biochemistry
Co-author(s): Rebecca Bradnam
Patterson Hall 208, 9:00-9:15 AM
Faculty Sponsor: Dr. Boylan & Dr. Barrios
Funding Received from the Drinko Center

Trees are a large part of Tolkien’s world of Middle-Earth and they are much more life-like in his fictional world than they are in reality. Certain trees in Middle-Earth are widely seen as evil or simply thoughtless and cruel. The evidence that supports this thought can be argued, and I have found cues in certain texts and Tolkien’s own writing that can be interpreted as the trees being misunderstood. Other scholars have written in favor of the trees being evil. To explore just why they believe so, I bring up the point of view of these scholars and then argue against them. I focus on the Old Forest, and one of its more controversial residents, Old Man Willow, to prove that the trees in Middle-Earth are not evil beings but reactionary creatures. I also give passing mention to Fangorn Forest.

This study examined if executive function predicts prosocial behavior. 32 preschool children, aged 3 to 5, were used. The study used 2 executive function measures; inhibition and working memory and 2 prosocial laboratory tasks that looked at willingness to help and a teacher rating prosocial questionnaire. To test the hypothesis that higher levels of executive function would predict higher levels of instrumental prosocial behavior a correlational analysis was conducted. Results showed that higher levels of inhibitory control were predictive of higher levels of prosocial behavior. Implications include that inhibition may be crucial to the development of prosocial behavior.

Recently, students at Westminster College have attempted to replicate the results described by Tchobanov et. al. to no avail. These students performed assays on the vinylphenol reductase enzyme lysed from Brettanomyces bruxellensis. A major issue that seemed to recur in the procedures was that the mixture of 4-vinylphenol (10% w/v in propylene glycol) and tris buffer (15.5 mM, pH 7.4) produced a white precipitate. The current project was designed as a way of identifying the chemical makeup of the white precipitate as well as determine a ratio of aqueous components to organic components in the assay. It was determined that the proper ratio of aqueous to organic is 1.6:1 and that the precipitate is solid tris that crashes out of solution.

Sucralose is a zero-calorie alternative to regular sugar – differing only by two chloro groups replacing two
hydroxyl groups of sucrose. Saccharides, like sucrose and sucralose, can be detected and quantified after treatment with Seliwanoff reagent. Seliwanoff reagent transforms the sugar molecules, producing a peach-colored solution. When analyzed with UV-VIS, the intensity of color corresponds quantitatively to the original sugar concentration. Additionally, treatment with Seliwanoff reagent is hypothesized to result in florescence due to the highly conjugated structure of the resultant molecules. The proposal would also be that the chlorines, due to their strong electronegativity, produce a noticeable difference in florescence intensity. In summary, our purpose is to clarify these two quantitative methods: fluorescence and UV-VIS analysis after treatment with Seliwanoff reagent.

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<th>Jordyn Moon</th>
<th>Psychology</th>
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<td>Mckelvey Campus Center Witherspoon,</td>
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<td>Poster Session C 11:30am-12:30pm</td>
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<td><strong>Effects of Disability Exposure on Implicit Association Test (IAT) scores</strong></td>
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<td>This study examined the effects of exposure to counter-stereotypical about physical disabilities on implicit attitudes. Ten undergraduate students were assigned to write about someone who has overcome a physical disability while the other ten students were given a filler task prior to taking the Implicit Association Task (IAT). It was hypothesized that both groups would have equally negative implicit attitudes. However, the results revealed that the implicit attitudes of participants who wrote about an individual overcoming a disability showed significantly more negative implicit attitudes than the filler task group whose attitudes were also negative. It is believed that writing about physical disabilities resulted in increased accessibility of negative attitudes because memory prefers stereotype congruent information rather than incongruent information. Repeated presentation of counter-stereotypic information is suggested in order to overcome this memory bias.</td>
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<th>Ashley Moon</th>
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<td><strong>The Impact of the H.J. Heinz Company buyout on the City of Pittsburgh</strong></td>
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<td>In 1888, Henry John Heinz took control the H.J. Heinz Company famous for its iconic Heinz 57 Ketchup. Founded in Pittsburgh, the company has remained headquartered in the city even after a buyout in 2013 by Berkshire Hathaway, Inc. and 3G Capital. Following the completion of the buyout, the new Heinz executives announced layoffs, about 350 of them from the company’s headquarters in Pittsburgh. We will be examining Pittsburgh’s feelings toward the change in Heinz and seeing what kind of impact the move has had on Pittsburgh citizens, organizations, and companies. Because Pittsburghers are very loyal, we think that the results have been significant. Although our research shows that Pittsburgh is improving from the perspective of those outside the city, the buyout may have a negative impact on the citizens of Pittsburgh. We will continue to research the impact the buyout has on the image and attitudes toward the city of Pittsburgh.</td>
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<th>Isaiah Morgenstern</th>
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Folding Polymers
Proteins are polymers that fold up into stable structures. Parts of the protein may be very rigid while other sections vibrate. In order to understand what makes folded proteins so stable and what leads proteins to fold, I am constructing a computer code to model polymer behavior. This program will model a polymer chain—such as a protein—and the physical forces that affect each atom in the chain. Using spring-like forces and electrostatic forces, I will observe how each individual atom reacts to the force it experiences. My research is just a preliminary study to set up the computer model. In the future I will use this program to observe how polymer chains react under different parameters.

Brandon Mosley
Mathematics
Patterson Hall 106, 12:30-12:45 PM

Ninth Inning Decisions: A Statistical Analysis of the Sacrifice Bunt
We will, through the use of probabilities and statistical analysis, examine whether the sacrifice bunt in baseball actually increases the chance of scoring a run, and formatted to look at the games events as a Markov chain. The calculations will done using computer simulated games, expected run probabilities, and the concept of a break even percentage. It is expected that in most cases it is better not to bunt.

Kevin Mroz
Biology
Co-author(s): Christina Campbell
McKelvey Campus Center Witherspoon,
Poster Session B 10:00am-11:00am

Online exercises do not improve student learning over traditional introductory biology teaching methods in a small liberal arts setting
Hybrid courses combine the advantages of online education and traditional lecture-style classes in an attempt to provide students with a greater depth of content knowledge. We studied the effectiveness of the hybrid method at Westminster College. In addition to lecture and laboratory sessions hybrid weeks included online quizzes based on textbook readings taken before the material was covered in class and online activities. We have specifically applied this approach to both a broadly focused non-majors biology course (Bio 101) and an introductory biology course for majors (Bio 201). Retention of information was measured by analyzing student improvement on questions between a pre-test and midterms or final exam. We compared both retention of information by topic and by Blooms Taxonomy. Surprisingly we found that in both courses the addition of online work had no significant affect on their retention of information.

Julianna Murphy
Public Relations
Co-author(s): Jennifer Feil
McKelvey Campus Center Witherspoon,
Poster Session D 1:00pm-2:00pm

SeaWorld & Lush Cosmetics: Making a Splash with Animals
This case study explores the connection between SeaWorld and LUSH Cosmetics. LUSH Cosmetics has been fighting against animal testing for 30 years and is one of the most well-known cosmetic companies in the
United States. SeaWorld has been under scrutiny after allegations of animal abuse and maltreatment have surfaced. These companies crossed paths when the documentary Blackfish was aired on CNN. LUSH has participated in several animal cruelty protests against SeaWorld. We will conduct qualitative and quantitative research tactics to show how these companies utilize public relations and communication strategies to maintain their image, reputation, and goodwill. This case study can be used as a model for practitioners weighing the options of possible reactive and proactive solutions for their own organization.

**Danielle Murtagh**
Chemistry  
*McKelvey Campus Center Witherspoon,*  
*Poster Session C 11:30am-12:30pm*

**Use of experimental design to minimize coprecipitation of barium and strontium from produced water from Marcellus Shale**

As the natural gas industry expands, utilization of hydraulic fracturing to obtain natural gas also increases. This process requires millions of gallons of water per well. Over time, these wells produce waste water (produced water) which contains very high concentrations of barium, strontium, sodium, chlorides, and many other substances. By collaborating with ProChemTech International Inc., we are optimizing a treatment process for produced water which recovers sellable products. For example, barium and strontium can be recovered as sulfates from produced water, but they precipitate out of solution together. In order to optimize the separate recovery of barium and strontium, we use experimental design to study how various factors, such as the concentration of precipitating agent, and temperature affect the precipitation process. Inductively coupled plasma-optical emission spectroscopy, and laser induced breakdown spectroscopy are used for analysis of precipitates and filtrates.

**Brittany Natale**
Biology  
*McKelvey Campus Center Witherspoon,*  
*Poster Session C 11:30am-12:30pm*

**Effects of desferioxamine on Staphylococcus aureus biofilm formation**

Prevention and treatment of Staphylococcus aureus biofilm infections are an ongoing challenge in healthcare settings. These bacteria can develop resistance to treatment methods like antibiotics and become increasingly harmful when organisms colonize and form biofilm. The goal of this study was to investigate if an iron chelator, desferioxamine (DF), is capable of decreasing or eliminating the formation of S. aureus biofilm. Cultures of S. aureus were treated with various concentrations of DF and biofilm was measured using crystal violet staining with spectrometry and a tilt-plate method. Both methods yielded results supporting that DF concentrations of 60 μM or more eliminates the formation of biofilm, with a cut-off threshold between 45 and 60 μM. Furthermore, result trends show that as DF concentration decreases, biofilm production increases. These results are significant to the medical field because there is not yet a remedy that both eliminates biofilm and is safe for patients.

**Laura Nice**
Biochemistry  
*McKelvey Campus Center Witherspoon,*  
*Poster Session A 8:30am-9:30am*
Method Development for Quantifying Naphazoline Hydrochloride and Pheniramine Maleate in Ophthalmic Solution Using HPLC

Naphazoline hydrochloride (NH) and pheniramine maleate (PM) are two active ingredients found in allergy relief ophthalmic solutions. NH acts as a vasoconstrictor while PM acts as an antihistamine. A method to quantify these two compounds was determined using high performance liquid chromatography (HPLC), which is an efficient instrumental method to analyze pharmaceuticals. The best conditions for quantifying NH and PM standard solutions was determined by trying silica and C18 columns as well as a variety of solvents. The optimal parameters were found to include a silica column with a mobile phase of 70:30:0.04:0.03 methanol, water, acetic acid, triethylamine. The silica column and C18 column have different elution mechanisms, with the silica column mechanism being the most beneficial method. If successful and replicable, the methods developed in this project could be utilized as a teaching laboratory experiment.

Samantha Nickoson  
Business Administration  
Co-author(s): Graeme Crawford 
Patterson Hall 106, 10:40-10:55 AM

A Cost-Benefit Analysis of Wild Horse Preservation in the Western United States

Since the establishment of the 1971 Wild Free-Roaming Horses and Burros Act, there has been much controversy over dedicating so much land to these animals that have become an icon of the American Spirit. We have conducted this research through a cost benefit analysis, where the costs have been determined through government agencies such as the Bureau of Land Management and state financial reports. Data on benefits can also be found in these reports, as well as a survey presented to Westminster students, equine communities, and others. We intend to show that the benefits of preserving wild horses and burros supersedes both the costs of preserving them, as well as the costs of alternatives methods of controlling populations.

Margaret Nikituk  
Biology  
McKelvey Campus Center Witherspoon,  
Poster Session A 8:30am-9:30am

Effects of edges on nest site selection of secondary cavity-nesting species in western Pennsylvania

Fragmentation of landscapes is a common occurrence creating edge habitats. It is unclear from previous studies what edges secondary cavity-nesting species prefer because of the differing abiotic and biotic factors present in each geographic region. We monitored fifty-five nest boxes by recording the species in each nest box from April until early August. We quantified edges by measuring 25-m radius plots around each box and recording the percentage of trees, grass cut or uncut, water, and structure. From quantifying edges, four categories were found: Open, Grass, Forest, and Hedge. Results showed House sparrows preferred Open edge types and no significance was found for nest site selection for the Eastern bluebird or House sparrow. Where House sparrow populations were highest, no Eastern bluebirds were present. Learning the relationships between different birds and edge types can indicate how different landscapes may affect the productivity and survival of different birds.
The Reconstruction of New Orleans: Is it Worth it?

Hurricane Katrina devastated the city of New Orleans which was once a city full of economic opportunity and growth. According to statistical data over the years, do the benefits of rebuilding really outweigh the costs? The monetary cost of rebuilding the city is estimated to be $200 billion. Rebuilding the city could just be prolonging another disaster, not to mention the sea levels are quickly rising. Since rebuilding, the economy has increased greatly but will it ever get back to where it was before? The money used to rebuild New Orleans could have been utilized many other ways which could have been more beneficial to both the economy and the people.

Embracing Different Cultures

Our presentation will be about bringing award winning authors to visit college campuses. We will go through the steps on how to bring an author to a college and local school districts such as elementary schools. We will be discussing our research about the importance of author visits to schools. There are many important steps involved. The first step is finding an author that is both financially possible and benefits the students. We always look for an author that is culturally diverse. The most important step is finding a funding source. We will discuss on how to team up with area school districts to help sponsor the event. We will also discuss the timeframe on when planning needs to begin at each step.

Determination of the

The objectives of this experiment were to determine an inexpensive and time conservative procedure to find the activation energy and rate constants between two isomers through flash photolysis. This experiment used 4-anilino-4' -nitroazobenzene in four different solvents: acetone, diethyl ether, p-xylene, and 4-methyl-2-pentanone. These samples were measured at different temperatures to observe the connection between rate constants and temperature.

T.S. Eliot: A Hopeful Poet

Most people think of Modernism as dark and depressing critiques about the hopelessness of an empty life. To an extent, this assumption is true. However, I believe there to be a certain element of optimism that gets
overlooked in most Modernist texts. In his search for optimism in a dark age, T.S. Eliot uses his Modernist
critique when writing The Waste Land to provide commentary of a scared public. In The Waste Land, Eliot takes
the opposite feelings everyone struggles with and confronts them with this skepticism in an attempt to bring us
some peace. Each stanza examines two binaries-- the type of conflict that tears us apart because a solution
seems so far away. This skepticism spawns our questioning of the opposites as Eliot seeks to be a hopeful poet
in a disillusioned world by bringing us a solution to one giant question that is The Waste Land.

Joshua Phillian
PreK-4 ECE/PreK-8 Spec Ed
McKelvey Campus Center Witherspoon,
Poster Session A 8:30am-9:30am

A Closer Look at the Common Core
Due to Pennsylvania’s adoption of the Common Core State Standards in Mathematics students are now
presented with many different strategies to solve a problem. Given that students learn differently, this
approach can reach a variety of learners (Dignath, Buettner, Langfeldt, 2008). However, can it be
overwhelming for some students to have many different strategies presented to them? Is it too overwhelming
for them to determine which strategy works best for them? Even though all students learn differently, there is
limited research that addresses the issue of whether or not students can understand and grasp different
strategies when being presented to them in so many ways. As part of my regular 2nd grade mathematics
instruction I investigated these questions. The purpose of my action research project was to see if struggling
students’ computational ability improved when practice focused on one student preferred strategy rather than
requiring the use of all strategies.

Gregory Polcha
Biology
McKelvey Campus Center Witherspoon,
Poster Session D 1:00pm-2:00pm

Effects of habitat alteration on northern dusky salamander (Desmognathus fuscus) populations in western Pennsylvania
Alteration of wildlife habitats for renewable energy development is a current issue of concern for biologists.
Establishment of natural gas wells may increase sedimentation in riparian habitats and alter species
composition. We evaluated habitat occupancy and abundance patterns of Northern dusky salamanders
(Desmognathus fuscus) at streams near natural gas well pads. Within each plot, we measured variables that
indicated levels of sedimentation in streams. We conducted a model selection exercise with generalized linear
models to evaluate which variable or combination of variables were most important for predicting salamander
occupancy and abundance. Sites with lower embeddedness and higher pH which were downstream from well
sites were more likely to be occupied and supported higher abundances. Our results suggest the establishment
of well pads may impact the streams through sedimentation, but we cannot provide a specific mechanism for
how or when the sedimentation occurs.

Derek Pollice
Psychology
Patterson Hall 108, 9:25-9:40 AM
The Effect of Priming Diversity Attitudes on Creativity in Individualistic Versus Collectivistic Groups

The purpose of this study was to examine the impact of priming diversity attitudes within individualistic versus collectivistic groups on their creativity. Sixty-six undergraduate participants were recruited for 3-person groups. These groups were randomly assigned to one of six conditions: individualistic and positive attitudes, individualistic and negative attitudes, individualistic and no attitude priming, collectivistic and positive attitudes, collectivistic and negative attitudes, or collectivistic and no attitude priming. The brainstorming task was coded by two coders. It was hypothesized that individualistic groups with a positive diversity attitude toward diversity would produce the most creative outcomes, while collectivistic groups with a negative attitude toward diversity would produce the least creative outcomes. Analyses revealed no significance in the main effects—only one significant two-way interaction. The sample pool presented many limitations to this study.

Brett Pollock
History
Co-author(s): Courtney Edmondson
Patterson Hall 106, 1:45-2:00 PM

KC ACTF Irene Ryan Awards Performance
This past November, I was picked to attend the KC ACTF Irene Ryan Auditions at West Chester University to compete for a $50,000 scholarship. I was selected to attend this round of auditions for my performance in Italian-American Reconciliation this past November. For this audition I was required to perform two scenes with my acting partner (Courtney Edmondson), and a monologue. We chose to perform A Token to the Moon and Stop Kiss for my two acting scenes, and I chose to perform Danny and the Deep Blue Sea for my monologue. However, we did not advance past the first round of competition.

Cody Postupac
Physics
McKelvey Campus Center Witherspoon,
Poster Session C 11:30am-12:30pm

How Computer Science Can Improve High School Physics
As a future physics teacher it will be my responsibility to prepare and introduce my students for what a future in physics will look like, and a future in physics or engineer will involve computer programming. My task will be to write computer programs that provide support for the ideas that will be covered in a high school physics course. I want the students to be able to take the ideas and equations we will use in class and manipulate them to better their understanding. I will write the computer programs using the program Visual Python, which is well equipped to handle physical concepts. Vectors, kinematics, and forces are the three focuses of this project. The programs will successfully run and create 3-D images. These images would support the theories we covered in class. As job interviews approach, these programs would be an excellent addition to my teaching portfolio.

Nicholas Reinthaler
Biochemistry
McKelvey Campus Center Witherspoon,
Poster Session B 10:00am-11:00am
Developing Assays for Two Brettanomyces bruxellensis Enzymes

The yeast Brettanomyces bruxellensis is known to be responsible for the spoilage of red wine. Through the reactions catalyzed by coumarate decarboxylase and vinylphenol reductase, volatile phenols are produced. These volatile phenols are responsible for the off flavors associated with spoiled red wine. In this research, two types of yeast are studied: Brettanomyces bruxellensis and Saccharomyces cerevisiae. To study the production of the volatile phenols, a total of six cultures were grown, three for each type of yeast. The cultures were either uninduced, induced with p-coumaric acid, or induced with ferulic acid. The whole cell lysate activity for vinylphenol reductase was measured for each culture by a decrease in absorbance at 340 nm. The whole cell lysate activity for coumarate decarboxylase was measured for each culture by a decrease in absorbance at 285 nm. The results of these assays are compared to the results in the paper published by Godoy et al.

Allison Rice
Chemistry
Co-author(s): Hannah Anderson
McKelvey Campus Center Witherspoon,
Poster Session B 10:00am-11:00am

X-ray diffraction analysis of lutetium oxyorthosilicate (LSO) produced using a microwave-assisted hydrothermal method

Lutetium oxyorthosilicate (LSO) is a commonly used scintillation detector in positron emission tomography (PET), a noninvasive diagnostic technique. The current method to synthesize LSO, known as the Czochralski method, is very energy intensive, expensive, and time consuming. The microwave assisted hydrothermal synthesis of the powder form of LSO is being evaluated as a cheaper, more time and energy efficient method. This synthesis process involves combining lutetium and silicon in specified stoichiometric ratios before the microwave radiation is applied. The structural characteristics of the synthesized samples were analyzed using powder x-ray diffraction (XRD). The purity of the samples is evaluated using the ICDD PDF -4+ Database and Bruker DIFFRAC plus EVA software. Once the powder form of LSO is synthesized at a high purity and with similar properties to the crystal form, it will have the potential to be used in PET scans, which would greatly benefit the medical field.

Julie Rice
Chemistry
McKelvey Campus Center Witherspoon,
Poster Session A 8:30am-9:30am

Determination of biogenic amines as dansyl derivatives in red wine by high performance liquid chromatography with fluorimetric detection

Biogenic amines exist in fermented foods in varying amounts due to the bacterial degradation of the corresponding amino acid. High concentrations of biogenic amines such as tyramine and histamine are likely candidates for red wine headaches (RWH). Due to the high consumption of alcoholic beverages and possible harmful effects, their concentration levels in foods have been investigated using high-performance liquid chromatography after pre-column dansylation has been applied. The present work reports the efforts to reproduce a method that couples an existing HPLC with an existing spectrofluorometer to enable LC-UV and LC-fluorescence detection combinations. The instruments have been successfully coupled together, and fluorescence is detectable. This technique is now being optimized for the analysis of red wine samples from local wineries.
Effects of chemically dispersed crude oil and salinity on anatomical and physiological parameters of bluegill, *Lepomis macrochirus*

The use of chemical dispersants to remediate crude oil spills is common, especially in estuarine areas. Crude oil is composed of polycyclic aromatic hydrocarbons (PAHs), and dispersants facilitate the breakup of oil molecules, exposing fish directly to PAHs and causing structural damage to gill epithelia, osmoregulatory imbalances, and stress. Adult bluegill, *Lepomis macrochirus*, were exposed to treatments of crude oil, dispersant, and dispersed oil in both freshwater and 1.5% salinity for 48 hours. Blood samples were tested for glucose, hemoglobin, hematocrit, specific gravity, Na+, and K+. Gills were removed and processed to make microscope slides to observe morphological changes. Significant differences were observed in fish exposed to dispersed oil in freshwater for glucose relative to the control, but not in the other parameters. There were proliferative and degenerative changes in gill epithelia for all treatment groups. These results support current research in fish toxicology.

Budding Above the Law

Entering a brave new world, I set out as a fledgling drone enthusiast, just learning to fly, to record and learning the limits the law sets. Networking with drone professionals to capture video from great heights. The FAA has deemed commercial use of this footage as illegal, yet that has not stopped many drone enthusiasts and professionals from flying above the law and selling their video.

Vibrational Analysis of the Lucile Frey Nature Trail Bridge

I constructed a computer model of the bridge on the Lucile Frey Nature Trail that leads to the Westminster College Field Station. I performed a stress analysis on the model bridge to detect frequencies in the bridge from different sized loads. I selected this bridge because of its close location, low traffic volume and is known by the Westminster community. For these reasons, I could easily take measurements of the bridge and see for myself if there were any vibrations when I walked (or jumped) on it. I wanted to do this project to see if the frequencies I got from a computer simulation actually corresponded with vibrations of the bridge in real life and are the result of age or poor bridge design/installation.
Effects of dibutyl phthalate on limb regeneration in Ambystoma mexicanum

Axolotls are urodele amphibians which possess the ability to regenerate limbs and tails. DBP is a plasticizer that has toxic effects by inhibiting the activation of gene regulator NF-κB. NF-κB is responsible for Fgf-7 expression which is involved in cell proliferation. Fgf-7 codes for FGF-7, which is involved in epithelial cell proliferation during tissue repair. To assess the effect of DBP on Fgf-7 expression, axolotl limbs were amputated and re-amputated after 24 hours at blastema formation and Fgf-7 expression. Photos were taken every 3-4 days and analyzed using ImageJ to measure the rate of regeneration. The axolotls were then treated with either 25mg/kg body weight, 50mg/kg body weight, or a control solution. Results show decreasing total growth with increasing DBP concentration and increasing DBP concentrations decrease Fgf-7 expression in regenerating tissues. However, differences in the rate of limb regeneration and gene expression between treatments were not significant.

Sarah Roth
Neuroscience
McKelvey Campus Center Witherspoon,
Poster Session B 10:00am-11:00am
Faculty Sponsor: Dr. Robin McGovern
Funding Received from the Drinko Center

The Effect of Amphetamine on Ethanol Consumption and Ethanol Induced Locomotor Activity

Comorbid drug use of amphetamine and ethanol has increased. The purpose of the current study was to examine amphetamine’s affect on ethanol by 1) ethanol consumption in a limited access paradigm and 2) ethanol induced locomotor activity. The study was conducted using naive Long-Evans male (12) and female (12) rats with free-choice of water or ethanol (12%) during a two hours/5 days a week. Amphetamine alone decreased consumption in a limited access setting and created decreased locomotor activity. The implications of this study will provide further information on the effects of acute ethanol consumption and amphetamine use in humans.

Heather Santa
Neuroscience
McKelvey Campus Center Witherspoon,
Poster Session D 1:00pm-2:00pm
Faculty Sponsor: McGovern, RL
Funding Received from the Drinko Center

Effects of Ethanol on the Discrimination of Amphetamine Using a Water T-Maze

The current experiment tested the hypothesis that a water T-maze is a faster method of training on the drug discrimination task compared to traditional operant methods. The experiment also tested the hypothesis that the combination of AMPH and EtOH would reduce choice response accuracy on drug discrimination task. In this study 10 male, Long-Evans hooded rats were trained to discriminate 2 mg/g of AMPH from saline. After discrimination training a dose response was conducted to determine the range of doses that generalize to the training dose. EtOH dose of 1.5 g/kg was then combined with AMPH for a second dose response. The results of this study showed the effects of ethanol interfered with interoceptive cues of amphetamine and led to a reduction of choice response accuracy for each dose when compared to AMPH alone. The addition of EtOH attenuated the discriminative stimulus properties of AMPH.

Alexandria Schnarrenberger
Biochemistry
McKelvey Campus Center Witherspoon,
Faculty Sponsor: Dr. Sarah Kennedy
Funding Received from the Drinko Center
Creating Biochemistry Lab Protocols for Studying Lactate Dehydrogenase

The Biochemistry Laboratory course provides students with lab skills through a sequential series of weekly experiments. Techniques acquired include expression, purification, and characterization of E. coli alkaline phosphatase. The goal of this project is to widen the choice of proteins by writing protocols for studying lactate dehydrogenase. To accomplish this, the expression and purification of LDH was conducted using methods that include expression through E. coli BL21 cells by IPTG induced large scale growth, nickel affinity, and size exclusion chromatography. A Bradford assay has been conducted for analysis of nickel affinity column protein fractions; approximately 13.5 mg of protein was present for a total of five pooled fractions from a total growth volume of 1 L. Further data obtained will include quantification of protein from the size exclusion column and an LDH specific activity assay.

Nathaniel Schramm
Molecular Biology
Co-author(s): PJ Woods
McKelvey Campus Center Witherspoon,

Human TREX2 components PCID2 and Centrin 2, but not ENY2, have distinct functions in protein export and co-localize to the centrosome

TREX2 is a five protein complex involved in linking mRNA transcription and export. The centrin 2 subunit of TREX2, which is also a component of the centrosome, is additionally involved in the distinctly different process of nuclear protein export. In this study, we found that human TREX2 member PCID2, but not ENY2, is involved in some of the same cellular processes as centrin 2 apart from classical TREX2 function. PCID2 displays centrin 2 dependent centrosome localization in HeLa cells. PCID2, but not ENY2 is also involved in export. Specifically siRNA knockdown of PCID2 delays the rate of nuclear protein export. This result is distinct from the effects of centrin 2, which when knocked down inhibits export. Finally, we showed that co-depletion of centrin 2 and PCID2 blocks, rather than delays nuclear protein export, indicating the dominance of the centrin 2 phenotype. Together, these results represent the first discovery of specific novel functions for PCID2 outside of mRNA export.

Gretchen Schwarz
Psychology
McKelvey Campus Center Witherspoon,

Same-Gender Bias in Weapon Focus Effect in Eyewitness Testimony

The weapon focus effect (WFE) occurs during an event, such as a crime, that involves a weapon. The presence of a weapon diverts attention away from a perpetrator and other crime details; instead a witness focuses on the weapon itself. Weapon focus decreases the credibility of eyewitness testimony; attention increases on the weapon and decreases on perpetrator/scene details. This study tests if there is a same-gender bias with WFE, hypothesizing participants viewing a same gendered perpetrator will have less of a WFE than those viewing an opposite gendered perpetrator. College students (N=20) watched a fake crime video and were asked 15 specific questions about the crime and other peripheral details. Some questions did not relate to the video, potentially creating false memories. They were to respond ‘yes’, ‘no’, or ‘unsure’ and given a score based on the number of correct answers given.
**Sound Design for Italian American**

Joshua Scott  
*Communication Studies*  
*Mckelvey Campus Center Witherspoon,*  
*Poster Session A 8:30am-9:30am*

> Sound is a major component of our lives. Sound and music can represent a variety of moods and situations. Knowing this, sound is crucial to the performing arts. Theatre Westminster’s production of Italian American Reconciliation is no different. Sound created pivotal moments in the show. In order to get the most emotion out of these moments you have to be able to properly analyze the script, gather research, and communicate efficiently with your director to find the perfect sound.

**A Light in Dark Places: The Role of the Companion within Fantasy Literature**

Laura Seiple  
*English*  
*Patterson Hall 105, 9:25-9:40 AM*

> For centuries, the archetypal hero has been revered for bravery, selflessness and integrity. However, what many seem to forget is that heroes, though they defeat dragons, rarely complete such crippling tasks alone, often requiring help from companions. Despite enduring the same hardships, however, such companions are often dismissed for the hero, their importance deemed negligible. This project asserts the opposite is true: that not only is the companion important to the hero and to the tale’s plot, but also to the reader’s understanding and reception of that text. Using Tolkien’s The Lord of the Rings, I define the companion within the genre of fantasy literature, analyzing the three most vital roles the character portrays (motivator, protector, and friend) and ultimately finding that, while the companion may have been devised to assist the hero, the energy he expends to do so makes for a compelling study of one of literature’s most unrecognized archetypes and our nature as readers.

**"Me? Me?": Mother/Daughter Bonds and Identity in Toni Morrison's Beloved**

Alexis Sheffer  
*Psychology*  
*Mckelvey Campus Center Witherspoon,*  
*Poster Session C 11:30am-12:30pm*

> Traditionally, there is just one experience that separates men from women: women’s ability to give birth and thus develop uniquely maternal bonds with their children. For years, female writers have studied these bonds in order to better understand what their development and upkeep may mean for future relationships between mothers and their children. Toni Morrison is one such author, well-known within the literary community for her repeated focus on the negative aspects of such bonds. In particular, Morrison often examines how the influence of the mother or child may be a negative force on the identity of the other, as she does in her novel, Beloved. Using the relationship between Sethe and her daughter, Beloved, as a guide, this project endeavors to more closely examine Morrison’s exploration into the dark sides of motherhood and childhood, keen to note the disastrous consequences that may arise from allowing one’s child or one’s mother to have too much influence over one’s identity.
**Friend or Foe: Conformity with Friends**

This study examined whether the presence of friends increased conformity. Five student assistants were asked to nominate four of their friends to participate in this study. The friend group consisted of student assistants and their friends. The neutral relationship group consisted of student assistants and neutral participants to those assistants. Replicating the Solomon Asch conformity study, the participants were asked to choose which of three lines most closely resembled a different line drawn on a separate card, 15 cards were used in total. The student assistants were told to choose the correct answer for the first five responses and then purposefully chose the wrong answer for the next ten responses. Conformity of the participants was measured after the first five responses. The expected results are: conformity occurred when the participants performed the task with their student assistant friends rather than with neutral relationship student assistants.

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<tr>
<th>Allisyn Shields</th>
<th>Faculty Sponsor: Dr. Angela Lahr</th>
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<td>History</td>
<td>McKelvey Campus Center Witherspoon,</td>
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<tr>
<td>Poster Session D 1:00pm-2:00pm</td>
<td>The Pentagon Papers: Justification of U.S. Involvement in Vietnam, 1961-1967</td>
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The Pentagon Papers can be viewed as a source that provides an objective account of U.S. affairs with Southeast Asia before and during the Vietnam War. During the years of the war, President Kennedy and President Johnson both gave speeches to the American public about U.S. relations with Vietnam. This project documents the consistencies between presidential speeches and the justifications presented in the Pentagon Papers between the years of 1961-1967.

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<tr>
<th>Violet Shriver</th>
<th>Faculty Sponsor: Jim Mohr</th>
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<td>Accounting</td>
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<td>Co-author(s):</td>
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<td>Alexandra Taylor, Sarah Roth, Sara Halpin</td>
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**Pittsburgh - Malawi Partnership Journey 2013**

Romans 1:11-12 reads, "I long to see you so that I may impart to you some spiritual gift to make you strong, that is, that you and I may be mutually encouraged by each others faith." This verse served as our theme as we joined a group of 7 others on a trip to Malawi, Africa in the summer of 2013. On this trip we were all challenged, stretched, and encouraged in our faith as we spent time with our Malawian partners.

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<th>Rachel Simko</th>
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<td>Physics</td>
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<tr>
<td>Poster Session B 10:00am-11:00am</td>
<td>&quot;Modal Analysis on a Banjo&quot;</td>
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For my project, I will model a simplified banjo. At its most basic form, a banjo has two components: a circular membrane and a string. When a string is plucked, the waves in the string generate waves in the membrane and therefore causing the system to vibrate as a whole. I will perform modal analysis which will calculate the frequencies of vibration and corresponding mode shapes. Modal analysis will show and describe the propagation of structural vibrations, or how the waves travel throughout the system. I will use CAD software to model the
The purpose of this project is to investigate and analyze how the components of the instrument work together with focus on the vibrations of the system.

Cecilia Slifko
Psychology
McKelvey Campus Center Witherspoon,
Poster Session A 8:30am-9:30am

The Impact of Desensitization on Weapon Focus Effect and Eyewitness Memory

The present study explored the impact of desensitization to media violence on the weapon focus effect and eyewitness memory. The hypothesis stated increased exposure to violent media would lessen the weapon focus effect and strengthen eyewitness memory. Participants watched either four violent and gun-related, violent and non-gun-related, non-violent and gun-related, or non-violent and non-gun-related film clips. Immediately following, participants viewed a mock robbery video—the weapon focus stimulus—and listed details in a free recall task, selected perpetrators from simultaneous line-ups, and rated confidence levels regarding perpetrator selection. Results showed that the conditions did not cause significant differences between desensitization levels in the recall task, line-up identifications, or confidence ratings. These findings imply that increased exposure to violent media does not lessen the weapon focus effect or improve eyewitness memory.

Kelsey Squelch
Chemistry
McKelvey Campus Center Witherspoon,
Poster Session C 11:30am-12:30pm

Analysis of Disperse Orange 1 using Flash Photolysis

Disperse Orange 1 (4-Anilino-4′-nitroazobenzene) in cyclohexane was analyzed by flash photolysis and UV-VIS spectroscopy. Due to Disperse Orange 1’s push-pull characteristics originating from the electron donor anilino-group and the electron accepting nitro-group at the p and p’ positions, its rate constant from cis to trans isomerization can be analyzed through its change in absorbance. A photolytic flash was applied to solutions of Disperse Orange 1 in cyclohexane with varying temperatures of 20 °, 30 °, 40 °, 50 °, and 60 °C. The change in absorbance and return to the original absorbance was used to determine the rate constant and activation energy of the isomerization. The results provide a new strategy for the analysis of light sensitive dyes controlled by conformation change depending on temperature.

Ali Stark
Neuroscience
McKelvey Campus Center Witherspoon,
Poster Session C 11:30am-12:30pm

The Effects of Amphetamine and Acute Ethanol or Ethanol Withdrawal on a Behavioral Measure of Impulsivity

Alcohol, a common recreational drug, can have adverse effects when combined with other drugs. This study used a rodent model to test the influence of acute ethanol (EtOH) and EtOH withdrawal with or without amphetamine (AMPH) on a behavioral test of impulsivity. The differential reinforcement of low rates (DRL) task was used to measure impulsivity. The hypothesis of this study was that there would be a difference in the response accuracy between the six different treatment groups: saline control, EtOH, AMPH, EtOH and AMPH, EtOH withdrawal, and EtOH withdrawal and AMPH. The within subject design allows for each of the six rodents
to receive each treatment group in the previously stated order. After a repeated measures ANOVA the interaction of overall treatment on impulsivity was significant. Thus, this study found that when a drug is present compared to no drug at all, more impulsive choices are made.

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<th>Sara Stefan</th>
<th>Faculty Sponsor: Dr. Kennedy</th>
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<tr>
<td><strong>Development of G6PD Purification Protocol using Biochemical Techniques</strong></td>
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<td>In this project, the purification and expression of glucose-6-phosphate dehydrogenase is being investigated in order to create a protocol for future undergraduate students to use in biochemistry lab. The expression of G6PD requires more complex conditions that a typical E. coli overexpression at 37 °C for six hours with induction of 0.1 mM IPTG. In this project, different methods for the over expression G6PD are being explored to determine the optimal method. Temperature changes, induction with different concentrations of IPTG, and different incubation times are being studied to determine their effect on G6PD expression. Upon identification of the optimal protein expression conditions, the protein will be purified with a variety of chromatography methods. Ultimately, students in a biochemistry laboratory course will be able to purify G6PD with protocols developed in this research project.</td>
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<th>Bradley Steward</th>
<th>Faculty Sponsor: Dr. David Shaffer</th>
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<tr>
<td><strong>Audio Visual Technician Toolkit Mobile Application</strong></td>
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<td>Audio Visual Student Technicians are plagued by an abundance of tools and no efficient way to transport them all and have them remain available and easy to use. The need remains for a portable application to encompass several of these tools to be created. Other applications address this need but on a technical level that is advanced beyond the knowledge of a student technician. This effort is in progress by the presenter. Brad Steward is both a Westminster College Audio Visual Services technician and a Computer Information Systems major and is in a unique position to make this occur. The presentation will include demonstration of the mobile application and several features including a sound meter and troubleshooting work flow.</td>
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<th>Lauren Stoczynski</th>
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<td><strong>Effects of carbaryl and ammonium nitrate on zebrafish embryos: an ecological study</strong></td>
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<td>This study investigates the effects an insecticide carbaryl and the fertilizer component ammonium nitrate on zebrafish development. Carbaryl (0-20 μg/ml) and ammonium nitrate (0-100mM) were tested separately/in combination. Embryo length, diameter of yolk sac, and cell death were measured at 72 hours post fertilization. Carbaryl caused a significant decrease in embryo length and metabolism. Ammonium nitrate revealed a significant increase in embryo length and decrease in metabolism. Carbaryl and ammonium nitrate in combination show a significant decrease in embryo length and metabolism compared to the individual chemicals, suggesting an additive effect on embryo development. Treatments of carbaryl and combination showed a significant difference between apoptosis in control vs. treatment groups. This experiment</td>
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demonstrates that investigating single chemicals is not necessarily sufficient to make accurate predictions of how chemical react with organisms in a natural environment.

| Benjamin Suhrie | Faculty Sponsor: Dr. Howard |
| Psychology |
| **Patterson Hall 108, 10:40-10:55 AM** |
| **Bach Cello Suite No.1 Mvmts. v, vi, vii** |
| The Six suites for unaccompanied cello by Johann Sebastian Bach are some of the most frequently performed and recognizable solo compositions ever written for cello. |

| Erin Sullivan | Faculty Sponsor: Helen Boylan |
| Environmental Science |
| **McKelvey Campus Center Witherspoon,** |
| **Poster Session D 1:00pm-2:00pm** |
| **Using GIS and GPS coordinates to map ground truths for the Pennsylvania Game Commission and the Fisherman's Cove Preservation Foundation** |
| Geographic Information Systems (GIS) is used for mapping and analyzing special data. The Pennsylvania Game Commission has made priority of using GIS to track and manage game land parcels. As an Intern, tasks included digitizing and entry of data into the GIS database for game lands and checking for completion of feature classes. Data collection field work was done on a Trimble Nomad 900G to collect GPS unites and record feature class data. The Game Commission has a Cooperative Forest Game Program that allows land owners of large forested property to permit public hunting access and help to protect and manage the wildlife. The Fisherman’s Cove Preservation Foundation owns approximately 300 acres and participates in the program. Using ArcMap on the Nomad, ground truths of survey markers and land marks were digitized to create a map to compare acreage to survey maps held by the Venango County courthouse. |

| Jessica Szmara | Faculty Sponsor: Dr. Beverly Cushman |
| Christian Education |
| **McKelvey Campus Center Witherspoon,** |
| **Poster Session C 11:30am-12:30pm** |
| **Postmodernism and the Christian Meta-Narrative** |
| A shift from the modern era to the postmodern era is taking place in our culture. The postmodern era brings new ideas along with ways of interpreting the world. Some of these new ideas create a conflicting relationship between postmodernists and Christians. Such as, postmodernists are skeptical of meta-narratives, mainly because the Truth derived from them clashes with the postmodern idea of relative truths. The Christian faith on the other hand is wholly based on a meta-narrative. Conflicting ideas between postmodernists and Christians make ministering to postmodernists a challenging experience for both parties. If Christians can better understand postmodernists’ skepticism, then they can better understand the gap between postmodernists and Christians. Consequently, Christians can begin the conversation of how to effectively minster to postmodernists without jeopardizing Christian principles along the way. |

| Shane Tappe | Faculty Sponsor: Dr Webster |
| Biology |
| **McKelvey Campus Center Witherspoon,** |
| **Poster Session D 1:00pm-2:00pm** |
Gender Differences in Racial Bias using the Shooter Task Paradigm

This study investigates if women will show less bias towards minorities than men in the shooter task paradigm. 20 Westminster College students (10 men and 10 women) were presented with targets either armed or unarmed and either white or black. If the target was unarmed participants were instructed not to shoot, and if armed to shoot, regardless of race. The expected results are women will show no difference in reaction times for armed targets based on race, while men will shoot black armed targets quicker than white armed targets. As well, it is expected to show women will show no difference in reaction times for unarmed targets based on race, while men will be quicker to not shoot white unarmed targets than black unarmed targets. If the results are as expected, this shows that women are less racially biased than men, being a result of white women feeling less threatened by black men than white men are.

Effects of mate removal on house sparrow (Passer domesticus) nestling growth rates

Our study continued to look at the effects of mate removal in house sparrows (Passer domesticus) after Higgins and Duerr (2012), more specifically the effects it has on nestling growth rates. Provisioning measurements were taken on day 3 post-hatch before mate removal and day 4 post-hatch after mate removal. Also day 3 post-hatch, we removed one of the mates from the nest. We took standard morphological measurements of the nestlings on days 3, 7, and 12 post-hatch. When the male was removed the female showed she followed the negation rule. When the female was removed though, the male showed a decrease in visits to the nest. The mass of control nestlings was significantly greater (P = 0.002) on day 12 than both widowed male and female nestlings. We found biparental care to be more evolutionarily beneficial than uniparental care, which helps to explain to why in birds we see the use of both parents in the rearing of their young.

Subitizing: Developing Number Sense in the Early Childhood Setting

When looking at a dice, do you take the time to count each dot, or by a quick glance are you able to know how many there are? The ability to gauge a number of items by simply looking, rather than taking the time to count, is formally known as subitizing. Most subitizing research today occurs in classrooms of primary-aged elementary students (6-7 year olds), and links it to their number sense abilities (Yun, Harvard, Farren, Lipsey, Bilbrey, & Hoffer, 2011). However, if subitizing activities were implemented at an earlier age in the early childhood setting, how would students’ number sense development be affected? There is little research that addresses this question in the existing body of subitizing research. The purpose of our mixed methods study was to examine how the number sense of preschool students’ who participated in subitizing activities, compared to others who did not.
**Socio-economic Growth and Legal Modernization in Post-Franco Spain**

Given that Spain was under the control of a dictator from the years 1939-1975, it had little economic, legal, or social stimulation, causing it to fall short of Western standards in these matters. However, since the death of its dictator Francisco Franco in 1975, Spain has changed drastically in its laws, cultures, and economic growth. This study looks at the fast-paced changes that occurred within the nation, how the alterations in Spain's legal system affected the culture of the nation, and how the country has been able to work up to Western standards in both the realms of socio-economics and governmental law.

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<th>Dylan Thomas</th>
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<tr>
<td><strong>The Physics Behind The Perfect Knuckleball</strong></td>
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<td>The knuckleball is a rare pitch that seems to have sporadic movement, but physics can describe and predict the flight trajectory. The perfect knuckleball would be a pitch with the most movement during the course of its flight path, which is what many pitchers are trying to achieve. Many have said the perfect knuckleball must be thrown between 65 and 75 mph and must also have a half rotation of the stitches as the ball approaches the plate. All of these may be true but physics is the only way to truly know what will give the knuckleball the most movement.</td>
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<th>Samantha Thomas</th>
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<td><strong>Questioned Too Much: The Effects of Repeated Retrieval on Eyewitness Suggestibility</strong></td>
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<td>This study examined the effects of repeated retrieval trials on eyewitness suggestibility to false information encountered before testifying. College students (N=20) were asked to view a video of a mock robbery and then completed either 1 or 5 consecutive recall tests based on what they observed. After reading an article containing misleading information that summarized the events of the video, participants then took a final recall test based on what they witnessed in the video and chose the perpetrator in a lineup. I hypothesize that those who participate in the 5 consecutive recall tests will be more suggestible to the misleading information presented in the article, reflecting this in the final recall test. These findings will apply to eyewitnesses who may become more suggestible to false information due to being questioned multiple times before giving testimony.</td>
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<th>Emily Tittiger</th>
<th>Faculty Sponsor: Amy Camardese, Tina Keller</th>
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<td>PreK-4 ECE/PreK-8 Spec Ed</td>
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<td>Co-author(s): Lauren Sutton, Kearsei Dougherty</td>
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<td><em>Patterson Hall 207, 9:25-9:40 AM</em></td>
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<td><strong>Public Elementary Education and Religion: A Comparative Research Study</strong></td>
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<td>This research is a comparative study into the relationship between public education and religious identity in both the United States and Israel. The goal of this research was to understand the differences between the various ways fifth graders and educators in the U.S. and Israel experience religion in public schools. The</td>
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research is intended to find out how students are able to talk about their religious practices and what influences teachers might have on their ability to feel comfortable in the classroom about religious practices. While conducting the research in Israel, pre-service educators identified cultural differences between various religious groups in comparison to the U.S. public education system by conducting multiple teacher interviews and student surveys in three separate school environments (Druze, Arab, Jewish). Overall, the research highlights the importance of culture and diversity in the classroom and how students view their own cultural and religious identity.

Thomas Turnbull  
Financial Economics  
Co-author(s): Aaron Sutton, Kyle Dickel, Julie Bearer, Zachory Galasso  
Patterson Hall 208, 12:30-12:45 PM

Challenging Mr. Market

Benjamin Graham, the father of value investing, doubted the ability of an analyst to uncover the intrinsic value of a company’s stock. He regarded such calculations as fruitless because they require knowledge of an unknowable: the company’s long-term earnings growth rate. This suggests a more useful approach would be to reverse engineer a company’s implicit long-term growth rate from its known stock price, book value and short term projected earnings. We can then use that implicit growth rate to understand\'challenge the market price of a company’s stock.

Krista Ulisse  
Chemistry  
McKelvey Campus Center Witherspoon,  
Poster Session D 1:00pm-2:00pm

Comparative Analysis of Metals in Hair and Fingernails Using ICP-MS

Fingernail and hair samples are reliable indices of metal concentrations in the human body. However, the methodology utilized to prepare these samples can cause variability in the experimental results. In some cases, published concentrations of a given metal in the same matrix vary by up to two orders of magnitude. Given the variability in published results and our own preliminary analyses, the objective of this study was to characterize the accuracy and precision of data obtained using two sample preparation methods for both fingernails and hairs. Samples were collected from adults, cleaned and digested, and analyzed for strontium, selenium, zinc, lead, mercury, cadmium, and iron using inductively coupled plasma-mass spectrometry (ICP-MS). Results were processed to explore the impact variables such as toxin exposure, diet, gender, and age have on the data. Future research will explore relationships among metal concentrations in nail and hair samples and environmental health.

Tyler Umstead  
Chemistry  
McKelvey Campus Center Witherspoon,  
Poster Session A 8:30am-9:30am

Lab Analysis of Barium and Strontium in Produced Water Coupled with Website Design Empowers Local Communities Amidst Hydraulic Fracturing in Western Pennsylvania
Developments in drilling techniques, such as hydraulic fracturing, have enabled natural gas extraction from PA’s Marcellus Shale rock. As gas drilling expands, the potential for spills or leaks into the environment grows. Produced water resulting from fracking contains hazardous chemical species, heavy metals, and radioactive elements. With high concentrations of heavy metals like barium and strontium in produced water, they are good indicators for spills or leaks, should such an event occur. My research developed an analytical approach for determining Ba and Sr concentration in produced water using ion exchange and comparative analysis with flame atomic absorption spectroscopy and inductively coupled plasma optical emission spectroscopy. We have also worked on website development for our local volunteer water monitoring program, Lawrence and Mercer ALLARM. Facing possible drilling impacts on water resources, communities can benefit from heavy metal testing and website development.

Nicole Viviano  
Psychology  
McKelvey Campus Center Witherspoon,  
Poster Session D 1:00pm-2:00pm  
Effects of Women’s Body Fat Levels on Men’s Perception of Physical Attractiveness  
This study evaluated which body characteristic, body fat percentage (BF%) or waist-to-hip ratio (WHR), played a more dominant role in attractiveness of female bodies. Male Westminster College students (N=20) were presented with 21 dual-energy X-ray absorptiometry (DEXA) images of female bodies, classified by 7 levels of BF% (15-20%, 21-25%, 26-30%, 31-35%, 36-40%, 41-45%, and 46-50%) and 3 levels WHR (0.6-0.66, 0.67-0.75, and 0.76-0.88). Participants were asked to choose the most preferred image when given 96 pairs of these images; as well as, give a rating, on a scale of 1-10, with 1 being least attractive and 10 being most attractive, of all 21 images when placed together. I predict that, regardless of WHR, as body fat percentage increases, attractiveness ratings will decrease.

Scarlett Vogle  
Psychology  
McKelvey Campus Center Witherspoon,  
Poster Session B 10:00am-11:00am  
Math Is Art  
Mathematical equations can be used to generate stunning artwork. We wrote a computer program in Processing to display images based on randomly selecting functions to color points in the plane. These images are called flame fractals. To generate more interesting pictures, we made the program interactive by setting up different keys to change the parameters of the functions and to modify the colors associated with each function. Also variations can be applied to each function, which can have a dramatic effect on the final image.

Christijana Vucenovic  
Mathematics  
McKelvey Campus Center Witherspoon,  
Poster Session B 10:00am-11:00am  
Flame Fractals  
Flame fractals are beautiful, abstract images which are generated by listing any desired number of functions, and then calling on the functions at random to map points in the plane to other points in the plane. In this presentation, we will display flame fractals we created using a computer program called Processing. We will
also discuss fractal dimension and some applications.

### Properties of simple, cubic graphs that contain three unique Hamiltonian circuits

By the Four Color Theorem, we know all simple, planar, bridge-less, cubic graphs can be face-4-colored and edge-3-colored. There is a one to one correspondence between the number of edge-3-coloring and face-4-colorings. By a result of Growney, we know that a graph that is uniquely colorable contains exactly three Hamiltonian circuits. In this presentation, we will explore the properties of simple, planar, bridge-less, cubic graphs that contain exactly three Hamiltonian circuits.

### Prime Factorization of Kaszonyi Numbers

Snarks are a class of simple, cubic, non-planar graphs that cannot be edge-3-colored. In my presentation, I will introduce the concept of a Kaszonyi number of a snark and explain methods used to find new prime factors for Kaszonyi numbers.

### Modern urban transportation methods and their environmental impacts

Cities have contributed to humanity’s economic wellbeing and are the epicenter of cultural influences. Because cities are ideal places for people to live they can offer many solutions for the global population crisis. However, there are many concerns about how urban living affects the environment since over half the world’s population resides within large cities today. Pollution is an important environmental concern. One significant contributor to city pollution is vehicle emissions. However there are some significant differences in vehicle use between cities with different structures. Our project examines how urbanization structure affects transportation usage. By looking at different cities we will compare how structure and transportation affects inner city environments, and explore possible solutions to lower city pollution levels. Studying how urban transportation contributes to global pollution will allow us to understand one part of the environmental impact that cities create.

### Invading the Decades: Social Commentary in Alien Science Fiction Novels

This study takes a cultural criticism look at a group of science fiction novels, particularly those that center on alien encounters, and describes how the authors of these novels commented on the events and culture of their
times by allowing those factors to influence their stories. The novels include Harry Bates’ “Farewell to the Master” from 1940, Ray Bradbury’s The Martian Chronicles from 1950 and Robert Heinlein’s Stranger in a Strange Land from 1961. Each decade is unique to each novel in that the events that happened to the characters in the stories were often inspired by what the authors of these novels saw happening around them at the time they were written. By linking real life events and cultural influences to their fictional stories, the authors have the power to critique their time period in such a creative way that it allows readers in the present to better understand what life was like back in the authors’ times.

Megan Wetzel
English

Patterson Hall 207, 12:30-12:45 PM

**Been There, Done that, Sat on a Rock**

This is a power point presentation of my experience on the Greek cluster trip and how I incorporated the trip into my creative portion of my English capstone. The power point includes pictures I took, excerpt from my travel journal, and sections of my capstone. I will talk about the Hero’s Journey in relation to my pictures and my story. The story is titles Zero to Hero and is about a 12-year-old girl who visits Greece with her classmates. When a fellow classmate accidentally releases the ancient Greek gods, the journey begins. The gods posses the other students and try to bring the modern world to a halt and reverse it back to ancient Greek times.

Teresa Whetstone
Political Science

Co-author(s): Jessie Klousnitzer Alec Fisanick

**McKelvey Campus Center Witherspoon, Poster Session D 1:00pm-2:00pm**

**Westminster MUN**

Westminster MUN club attended AMUN in Chicago, il

Marc Williams
Biochemistry

Co-author(s): Brianna Landis

**McKelvey Campus Center Witherspoon, Poster Session C 11:30am-12:30pm**

**Mutagenesis of α-glucosidase for an Inhibition Study Regarding Diabetic Hyperglycemia**

Postprandial hyperglycemia is associated with diabetes mellitus and is caused by the conversion of carbohydrates to glucose by the enzyme α-glucosidase. Inhibition of the enzyme could reduce the rate of glucose absorption. Preliminary data, collected using commercial α-glucosidase, suggests Ecklonia cava as an inhibitor of α-glucosidase. The goal of this study is to create an original source of α-glucosidase. The Expresso® cloning system will be utilized to move the α-glucosidase from the ZM552 plasmid into an E. coli expression plasmid with a C-terminal his-tag. Mini-prep was utilized to purify ZM552 plasmid and PCR was conducted in attempt to amplify the α-glucosidase gene. Preliminary PCR data was inconclusive. Restriction enzyme digests will be employed to confirm that the α-glucosidase gene is present in the plasmid. Upon confirmation, the Expresso® cloning system will be utilized for gene transfer. Further research will include mutagenesis and
additional assays of the protein.

Melissa Williams

English

Patterson Hall 208, 9:50-10:05 AM

To The Truth! Experience is Discursive

According to Smith and Watson in their book "Reading Autobiography," experience is an interpretation of the past in the context of culture, history, society, material and psychic relations. In other words, experience is discursive. Further, experience is valid (or "true") whether or not it is cloaked in contradiction. "Fanny Kemble’s Journals" and Mary Shelley’s "Frankenstein" are great examples of the workings of autobiographical truth; they are extremely discursive, yet are able to solidify the truth of their respective experiences through implicit and explicit claims. This presentation aims to discuss the workings of autobiographical truth in these narratives, focusing particularly on the impact this element of truth has on these narratives and others like them.

Sophia Yargo

English

Patterson Hall 107, 9:00-9:15 AM

“You Are the Last Man in the World I Could Ever be Prevailed Upon to Marry”: Rejected Marriage Proposals, Women’s Power, and Transformation in Austen’s Pride and Prejudice and Gaskell’s North and South

The women who demonstrate a disregard for patriarchal marriage customs, found in Jane Austen’s Pride and Prejudice (1813) and Elizabeth Gaskell’s North and South (1854), demand love when some of their female counterparts do not, resulting in the heroines’ eventual contentment as they choose their fates. Though significant, this choice is only the beginning of the heroines’ path to self-realization. It becomes evident throughout the events of Pride and Prejudice and North and South that the heroines often reject proposals due to ill-perceived character and swift, unfair judgments. Although the heroine discovers and exerts her power in the moment of the rejected proposal, she grows in depth and virtue in the transformation that occurs afterward. The rejected proposal, then, acts as a catalyst in the heroines’ improvement. It sets in motion the events that will transform the heroines’ perceptions of the men whom they once rejected with hardly a thought.

Connor Young

Physics

McKelvey Campus Center Witherspoon,
Poster Session B 10:00am-11:00am

Ising model

The Ising model is discussed in Chapter 8 of Computational Physics which describes how Magnetism weakens when heat is added and strengthens when heat is taken away. The way magnetism works in iron, nickel, chrome, etc. is that there are microscopic dipoles that need to all need to be facing the same direction. The more heat is added to these metals the more frequent the dipoles switch directions overall making the magnetization weaker. A great way to expand on this idea is to come up with a program that varies heat and calculates the magnetization strength and the direction of the dipoles. Analyzing magnetism due to the type of metal we are heating up is also a great way to expand on this topic.

Kristin Zecchini

Biology

Faculty Sponsor: Dr. Kerri Cornell Duerr
Funding Received from the Drinko Center
**McKelvey Campus Center Witherspoon,**

**Poster Session A 8:30am-9:30am**

**Relationships between mammal road-kill occurrences and landscape types**

Landslces occur as mosaic patterns of patches containing different habitat types. The arrangement and connectivity of these patches can affect populations of mammals trying to obtain shelter, resources, and mates. Road kill was used to determine if there were relationships between the occurrences and landscape types. We performed field surveys of 20 transects in Lawrence County, PA and surrounding counties. At each carcass location, the species and landscapes were identified. We performed χ² goodness of fit test to determine if there was a relationship between the carcass frequency and landscape. A χ² contingency test using a 0/1 analysis was used to determine if there were differences in landscape used by mammals versus landscapes available. Possums, raccoons, and groundhogs had the highest number of carcasses. We determined the highest carcass frequency was in cover landscapes. We also found there was a difference between the available landscape and landscape being used by mammals.

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<thead>
<tr>
<th>Emily Zetzer</th>
<th>Faculty Sponsor: Dr. Sandra K. Webster</th>
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<td>Psychology</td>
<td>Funding Received from the Drinko Center</td>
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**McKelvey Campus Center Witherspoon,**

**Poster Session A 8:30am-9:30am**

**When Cues Collide: Facial Versus Nonlinguistic Vocal Cue Dominance in Emotion Decoding**

This study examined which communication mode: facial or vocal, is central when decoding emotion. Five nonlinguistic vocalizations and facial emotions were neutral, anger, fear, joy and sadness. College students (N=84) were presented with faces and voices in a 5 (Vocal Expression) x 5 (Facial Expression) x 2 (Target Gender) x 2 (Participant Gender) mixed design with repeated measures on the first three factors and asked to identify the emotion presented. Congruent trials consisted of vocal and facial expressions of the same emotion. Incongruent trials consisted of faces and voices that did not express the same emotion. Vocal cues were dominant in incongruent trials when vocal cues were anger, fear, or sadness. Joy was not well recognized with either face or voice in incongruent trials. Limitations include use of static faces with dynamic voices.