URAC 2017

PROGRAM OF ABSTRACTS

Wednesday, April 26, 2017
Sponsored by the Drinko Center for Undergraduate Research
Welcome to URAC 2017!

Westminster College is proud to host the 2017 Undergraduate Research and Arts Celebration. Today, approximately 300 students will present their research and creative projects through oral presentations, poster sessions, films, music and theatre performances, and art displays. Nearly every academic program on campus is represented in the outstanding work being showcased today, and students at all levels, from first years to seniors, will be engaged in the activities.

The Westminster College mission statement includes eight essential outcomes: to reason logically and evaluate critically; to communicate effectively; to think creatively and appreciate aesthetic expressions; to demonstrate intellectual curiosity; to acquire knowledge of self, society, human cultures, the natural world, and human relationships to God; to apply knowledge to contemporary issues; to demonstrate moral and ethical commitments to neighbor, society, and the natural world; and to demonstrate commitment to lifelong learning and the acquisition of skills for careers and responsible service as world citizens. The student work being presented, performed, and displayed today embodies all of these outcomes and is a testament to the value of a Westminster Education.

Our 2017 URAC participants are excited to share their work with the community today. Much of what you will see today is the culmination of years of study or countless hours of rehearsal. For some students, URAC 2017 will be their first formal presentation in college, and for others, participating in URAC 2017 is a final milestone before graduation. We are enormously proud of all of the students sharing their work today.

Today’s artists, performers, and scholars were supported in their endeavors by Westminster College faculty, staff, administration, and campus offices, as well as by parents and friends. We would like to thank everyone for providing this support and helping Westminster students to shine. Special thanks go out to the members of the Undergraduate Research Advisory Council, Library and Information Services, and Marketing and Communications. Their efforts made URAC 2017 possible.

We hope you enjoy today’s events! Thank you for joining us at the Undergraduate Research and Arts Celebration.

Karen K. Resendes and Pamela A. Richardson
Co-Directors, Drinko Center for Undergraduate Research
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 AM</td>
<td>Coffee &amp; pastry (Carlson Atrium)</td>
<td></td>
</tr>
<tr>
<td>8:30 - 9:30 AM</td>
<td>Poster Session A (Witherspoon Room)</td>
<td></td>
</tr>
<tr>
<td>9 - 10 AM</td>
<td>Theater Performances (Beeghly Theater)</td>
<td></td>
</tr>
<tr>
<td>9 - 10:55 AM</td>
<td>Concurrent Student Speakers Session I (Patterson Hall)</td>
<td></td>
</tr>
<tr>
<td>9:15 - 10:45 AM</td>
<td>Live Musical Performances (1&lt;sup&gt;st&lt;/sup&gt; floor McKelvey and Orr Auditorium)</td>
<td></td>
</tr>
<tr>
<td>9:45 - 10:45 AM</td>
<td>Poster Session B (Witherspoon Room)</td>
<td></td>
</tr>
<tr>
<td>11 AM - NOON</td>
<td>Remarks and Keynote Speaker (Will W. Orr Auditorium)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Opening Remarks: President Kathy Brittain Richardson</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Keynote Speaker Introduction: Dr. Helen Boylan, professor of chemistry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Keynote Speaker: Mallory Lichwa ’09, “From Westminster to Washington: A Professional Journey”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A special event for Westminster students, faculty and staff.</td>
<td></td>
</tr>
<tr>
<td>12:15 - 1:15 PM</td>
<td>Travel Mug (3&lt;sup&gt;rd&lt;/sup&gt; floor McKelvey)</td>
<td></td>
</tr>
<tr>
<td>12:15 - 3:15 PM</td>
<td>Live Musical Performances (1&lt;sup&gt;st&lt;/sup&gt; floor McKelvey, Berlin Lounge, Wallace Memorial Chapel)</td>
<td></td>
</tr>
<tr>
<td>12:30 - 1:30 PM</td>
<td>Poster Session C (Witherspoon Room)</td>
<td></td>
</tr>
<tr>
<td>12:30 - 2 PM</td>
<td>Concurrent Student Speakers Session II (Patterson Hall)</td>
<td></td>
</tr>
<tr>
<td>1 - 2 PM</td>
<td>Video Presentations (Mueller Theater)</td>
<td></td>
</tr>
<tr>
<td>1:45 - 2:45 PM</td>
<td>Poster Session D (Witherspoon Room)</td>
<td></td>
</tr>
<tr>
<td>2 - 2:30 PM</td>
<td>Art Presentations (Outside of Foster Art Gallery)</td>
<td></td>
</tr>
</tbody>
</table>
Samantha Adams  
Biology  
Faculty Sponsor: Dr. Marosh Furimsky  
McKelvey Campus Center Witherspoon, 8:30-9:30 a.m.  
Funding Received from the Drinko Center

The effect of masking the parietal eye on thermoregulatory behavior in the bearded dragon P. vitticeps and the green anole A. carolinensis

The parietal eye is a sensory structure in some lizard species containing a cornea, retina, and lens, which facilitates daily life functions such as thermoregulation and metabolism via melatonin release from the pineal gland. Our experiment investigated the effects of masking the parietal eye on thermoregulatory behaviors of the bearded dragon (Pogona vitticeps) and the green anole (Anolis carolinensis). Baseline behaviors were observed for both species before and after the parietal eye was masked with non-toxic black paint. Masking the parietal inhibits light signal transduction to the pineal complex. Lizard behavior was recorded, and baseline behaviors such as increased basking behavior under UVb light during the day were observed. After the parietal eye was masked, there were significant differences in behavior and basking activity and light preference of the bearded dragons. Anoles showed no significant differences in baseline behaviors after the parietal eye was masked.

John Arcuri  
Business Administration  
Co-author: Ben Stevenson  
Faculty Sponsor: Brian Petrus  
Patterson Hall 105, 12:30-12:45 p.m.

Finesse Footwear — The Business Strategy Game

The BSG allows students to experience the high level of strategy and decision making it requires to manage a successful international operation. Teams are responsible for making decisions about production standards, plant capacity, pricing strategies, employee compensation and Six Sigma practices, marketing strategies, distribution and logistics decisions, and other financial and stock-related decisions, with each week of class simulating one year in the organization. In generating the global top 100 rankings, the BSG measures teams on four performance variables: overall score, earnings per share, return on investment and stock price.
Jennifer Armen
Chemistry
Faculty Sponsor: Dr. Peter Smith
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.
Funding Received from the Drinko Center

**Synthesis of a Lanthanide Complex using Eu(NO₃)₃•6H₂O with Tripodal Ligand 2-OHnaphthtren (tris[N-(2-hydroxynaphthalidene)-2-aminoethyl]amine)**

The goal of the following experiment was to synthesize a new tripodal ligand (abbreviated 2-OHnaphtatren) and complex it with europium(III). Two different methods of the synthesis were carried out: one synthesizing the ligand first and then adding the europium salt and another that makes the ligand and complex in situ. The first method combined tris(2-aminoethyl)amine (tren) and 3-hyrdoxynaphthalene-2-carboxaldehyde forming 2-OHnaphthtren. To form the europium(III) complex, Eu(NO₃)₃•6H₂O was added to the ligand. The second method combined the lanthanide salt and salicylaldehyde first before adding the tren. Both 2-OHnaphthtren and its europium(III) complex were analyzed via x-ray crystallography. The ligand crystallizes in the P-1 space group with two symmetry equivalent positions within the unit cell.

Trevor Arrigoni
Mathematics
Faculty Sponsor: Dr. Leon Woodson, Morgan State University
Patterson Hall 105, 9:00-9:15 a.m.

**Computational Analysis of Dyck Path Characteristics**

Named after 19th century German Mathematician Walther von Dyck, Dyck Paths are a special type of Lattice Path most known for its relationship with the famous Catalan Numbers. Even with its long history, Dyck Paths are still being researched in the mathematical field of Combinatorics. In the mid-2000’s, Dr. James Haglund of the University of Pennsylvania conjectured 3 statistics on these Dyck Paths: Area, Bounce, and Diagonal Inversion (Dinv). Haglund proved later that when fixing the Length and Area of a set of Dyck Paths, Bounce and Dinv create equal multisets. This presentation will discuss this result with a brief discussion on research conducted at the 2016 SPIRAL (Summer Program in Research and Learning) undergraduate research program at Morgan State University involving an open problem that stems from this result.

Travis Ascione
Theatre
Co-author: Austin Miller
Faculty Sponsor: Dr. Terry Jachimiak
Beeghly Theater, 9:00-9:15 a.m.
Funding Received from the Drinko Center

**KCACTF Irene Ryan Competition**

This presentation is the culmination of the work we prepared for the Irene Ryan Scholarship Competition at the Kennedy Center American College Theatre Festival. I, as one of Westminster’s nominees, will be performing two scenes with my scene partner Austin Miller as well as a monologue. The scenes are from *Red* by John Logan and *This is Our Youth* by Kenneth Lonergan. The monologue is from William Shakespeare’s *Much Ado About Nothing*. 
Monte Carlo Simulation and Portfolio Optimization

People have often used historical data of stocks to try to simulate future stock return. This study used historical close prices of stocks to create a distribution of returns. The distribution was then randomly sampled to project the price of the stock the next day and then repeated to create a monte carlo simulation. The projected prices of these stocks were then analyzed to optimize a portfolio. I will discuss the results of the performance of the backtest (done in Quantopian). The performance will also be compared to the return of the S&P 500 and a risk free asset.

Implicit Association of Vertical Space and Gender Hierarchy

Explicit attitudes that men are above women is changing to that both genders are considered equal. Unfortunately, for the mentality to completely go away, the implicit association has to move in the same direction. The Implicit Association Test (IPA) will be conducted with twenty college volunteers, and the participants will identify words as masculine or feminine as fast as possible. These words will randomly appear on the top or bottom of the screen, and the participant’s reaction time will be measured. The expected results are that the speed for masculine words on the top and feminine words on the bottom will identified faster than if the word position is switched. If the data supports that masculine words are faster at the top and feminine words are faster at the bottom, then there is still an implicit association present in college students that men are above women. This is relevant to today’s society in the acts to achieve the perception that women and men are seen as equals.

The Overlap Between Defendants with Mental Disorders and Predictors of Support for the Death Penalty

Age, gender, race, political affiliation, and religiosity have all been found to be predictors of support for the death penalty. Studies also consider mental diagnosis of the defendant. This study hypothesized that participants who had characteristics that often predict support for the death penalty would be more likely to choose a death sentence for those with a psychopathy disorder than those with no mental disorder or a psychosis disorder. Participants (N=172) were randomly assigned to one of the three vignettes (no disorder, psychosis, or psychopathy). Females were more likely to administer a life sentence where as males were more likely to administer the death penalty. Women remained more likely to administer a life sentence regardless of mental health status, while males became more likely to administer a life sentence when a mental health disorder was present. In addition, political conservatives are more likely to administer the death penalty than political liberals.
Detecting the ampicillin resistant plasmid-mediated beta-lactamase gene in Escherichia coli using RING-FISH

The presence of antibiotic resistance in Escherichia coli is increasing at an alarming rate due to the overuse of antibiotics. E. coli retains its resistance to ampicillin by possessing the beta-lactamase gene located on the plasmid pAMP. We investigated detecting the beta-lactamase gene by applying recognition of individual gene-fluorescence in-situ hybridization. RING-FISH targets individual low-copy or plasmid-mediated genes and results in a halo-like fluorescence signal around the periphery of the bacterium. We constructed a fluorescent polynucleotide RNA probe specific for the beta-lactamase gene and hybridized the probe for 24 hours to E. coli cells harboring the pAMP plasmid and to cells that do not contain the plasmid. The hybridized E. coli cells from both cultures exhibited an optimal halo-like fluorescence signal under epifluorescence microscopy. Our findings indicate RING-FISH may not be suitable to differentiate between two closely related species of bacteria.

Take Video Gaming to the Next Level!

Game-On is the latest up-and-coming video gaming application that allows users to play their Xbox One and PlayStation 4 games on the go! The app uses the latest Bluetooth technology to connect the custom Game-On controllers to the user’s smart device and the smart device to either the Xbox or PlayStation. Finally, the video gaming industry can get rid of the ball and chain that has restricted play to one room for all of these years. Welcome to the future!

Increasing Audience Enjoyment Through the Use of a Theme, the Engagement of Performance Practice Techniques, and Multimedia

This session will discuss research on different performance practice techniques, themed recitals, and using multimedia to help an audience enjoy a voice recital.

Cedar Farm Inn Environmental Science Internship

During the spring semester of 2017, I worked as an intern at Cedar Farm Inn. Cedar Farm Inn is a small bed and breakfast in a classic old farmhouse that often hosts weddings and other events on the scenic rural property. The
owners are dedicated to environmentally friendly living, and strive to keep the business eco-friendly by recycling, reusing, composting, and conserving energy as much as possible. As an Environmental Science Intern, I worked to enhance the business’s sustainable and eco-conscious practices, and to strengthen the connection to nature. I constructed a larger, more effective compost bin system, repaired and maintained bluebird boxes, and identified and labeled trees around the property. I researched testing methods and tested soil quality on the property. I also created a tri-fold pamphlet listing native species of birds and trees people might see while walking the nature trail and containing information about the steps taken towards eco-friendly business.

Dominic Boston
History
Patterson Hall 107, 9:25-9:40 a.m.

“He looked ... crazy”, A Critique on the Interpretations of Nazi Leader Rudolf Hess’s Mental Health

Throughout his life, Deputy Fuhrer Rudolf Hess suffered from a multitude of illnesses both mental and physical. The mysterious events in Hess’s life, such as his flight to Britain and his trial at Nuremberg, were all points for interpretation by people from around the world. From the views of psychiatrists to prison doctors, journalists to judges, and enemies or allies, everyone had their own interpretation of Hess. From a collection of multiple primary and secondary sources, this presentation offers insight into the comparisons and differences of one of Nazi Germany’s infamous leaders. The conclusions that come out of this research show instances of bias, plagiarism, and vengeful interpretations. These interpretations range from actual Nuremberg court documents to online news articles released today. Rudolf Hess’s mental health is still an issue up for historical debate. This presentation lays out the major sources which claim to know the true sanity, or insanity, of Rudolf Hess.

Emily Broderick
Psychology
Faculty Sponsor: Dr. Sandra K. Webster
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.

Our Nomadic Thoughts: Do Affect and Temporal Focus Impact Attention through Mind Wandering?

Mind wandering is a phenomenon in which attention shifts from an ongoing task to unrelated thoughts (Banks, Welhaf, Hood, Boals, & Tartar, 2016). It may be influenced by affect and temporal focus. 70 college students wrote about life events (positive affect/negative affect) or daily routines (neutral affect) in a specific temporal direction (past/future). Negative affect with future focus was predicted to produce the most intense mind wandering. Participants completed a Choice Reaction Time (CRT) task to measure attention. Thought probes monitored thoughts and mood during the task to measure mind wandering and its relation to attention. According to past findings, mind wandering should positively correlate with attention deficits. Mind wandering was produced in all conditions. CRT scores suffered, and participants in negative conditions produced lower scores than other conditions. Future research should address limitations of thought probes and affect/temporal focus induction.
Marijuana and Anxiety in Rodents: A study of the relationship between baseline anxiety and drug-induced anxiety in a rodent model

This study examined whether subjects with low baseline anxiety were more likely to display less anxiety in response to anandamide, a synthetic analog of THC with similar behavioral effects. The baseline anxiety-like behavior of 32 male Sprague-Dawley rats was measured using the Free-Exploratory Paradigm, a procedure thought to measure baseline anxiety-like characteristics. Subjects then received an injection of 0.4 mg/kg anandamide and tested on the Elevated Plus Maze, an apparatus used as a second measure of anxiety, this time in response to anandamide. The results of this experiment showed anandamide consistently decreased anxiety, regardless of baseline anxiety state of the animal. Brain tissue was harvested after behavioral testing and was utilized to examine whether the magnitude of the decreased anxiety-like behavior is associated with stronger activation of brain regions commonly associated with reductions in anxiety-like behavior.

“Why Wait? Get Served!”

“Why wait? Get Served!” with the “Wait on Me” mobile phone application. This application enables consumers to see the waiting times for restaurants, in the proximity of their desired location, for the exact number of people in their dinner party. “Wait on Me” aims to relieve the hassle of long waiting times for consumers, and to increase their overall dining out experience.

Winter Analyst Program

A group of students from a variety of academic backgrounds collaborated to perform a financial analysis of an industrial gas company, Praxair. The presentation to Westminster College trustees and alumni consisted of a rating methodology and stock recommendation, along with an analysis of environmental and international impacts.
Rustin Casteel  
Computer Information Systems  
Faculty Sponsor: Dr. Terri Lenox  
Patterson Hall 105, 9:25-9:40 a.m.

Finding the Difference in Change of Aggression Between the Sexes After Playing Violent Video Games

Much research has been done into whether violence in video games causes an increase in aggression in people. Evidence has determined that the correlation exists. However, the research into how violence in video games may affect genders differently is not nearly as expansive. The research focuses on multiple topics on the subject. The question addressed here is whether there is a difference in the level of aggression between genders after playing violent video games. Using the information researched, a test will be done to determine if there is a difference in the change of aggression between genders after playing a violent video game. The test will involve both genders playing a video game. Before and after playing the video game, participants will be asked to fill out the State Hostility Scale to determine aggression levels. After collecting the data, it will be reviewed to determine the changes in aggression for both genders, and a conclusion will be made.

Matthew Causer  
Public Relations  
Faculty Sponsor: Dr. Brittany Rowe-Cernevicius  
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.

“Bring them home” an analysis of the bring back our girls campaign

In 2014, the Islamic extremist group Boko Haram kidnapped 276 school girls from the Chibok School in northern Nigeria. What followed was a large and concerted grassroots campaign with the ultimate goal of forcing the Nigerian President Goodluck Johnathan and his government to launch a rescue operation for the school girls. Using a compilation of analysis of different social media posts and statements by political figures, this project analyzed the effectiveness of the “bring back our girls” campaign and the ramifications it had on international policy. Although the main objective of the campaign was not accomplished, in that Boko Haram is still at large and a large amount of the school girls remain missing, the campaign did galvanize interest in women’s issues in the developing world and brought the issue of international terrorism to the forefront of the Obama Administration’s foreign policy.

Nathaniel Cavlovic  
Biochemistry  
Faculty Sponsor: Dr. Erin Wilson  
Patterson Hall 108, 9:25-9:40 a.m.

Investigating the Behavior of Tertiary Osteocalcin Structure in Response to Calcium and Ficoll Environments

Osteocalcin is a protein that functions inside of bone tissue. Although it works in this crowded environment, affected by calcium, it is not known how its structure and function are affected, if at all. The tryptophan amino acids within osteocalcin allow the protein to absorb ultraviolet light, allowing for analysis using UV-VIS spectroscopy and fluorescence. When calcium is introduced into an osteocalcin system, the folded protein shifts the wavelength at which ultraviolet light is maximally absorbed, so spectroscopy can monitor this 3D folding state. These methods were utilized by examining the protein in different dilute solutions, at varying concentrations of ficoll: a polymeric crowding agent. The expected shift in the presence of Ca was observed as the protein folded, which confirmed previous results. In addition, ficoll had significant effect on structure, which shows that molecular crowding, such as within bone tissue, can be a great influence on overall protein structure.
Effectiveness of organic fertilizers on aeroponically grown purple mustard and aton basil

Indoor tower gardening is a space-saving, year-round alternative to conventional gardens. However, many tower gardening systems use synthetic, mineral-based nutrient blends to nourish the plants, which makes organic farming impossible. This study examines the effectiveness of an organic homemade liquid fertilizer as opposed to the conventional nutrient blends when growing common herbs and leafy plants. The plants were started from seeds in identical conditions, then moved to separate towers after two weeks. Colorimetry is used to determine nutrient levels in the water and in the plants themselves. Ash free dry weight is also used to determine which method produces more plant mass.

Katelyn Chill
Marketing
Faculty Sponsor: Dr. Robert Badowski
McKelvey Campus Center Witherspoon, 12:30-1:30 p.m.

Katie’s Closet: A Virtual Styling App Making Style Effortless but Glamorous

Apps are changing the way people perform daily life activities. Apps are revolutionizing e-commerce today and are created to make life easier. The app being introduced is a virtual styling app called Katie’s Closet. Katie’s Closet is an app that allows the user to upload photos of clothing they have in their closets, and the app puts together outfits that the user can style and wear with their clothing from home, using algorithms generated by a database of thousands of different clothing items. Women do not need to pay for a stylist’s advice when they use Katie’s Closet. The user can create a realistic avatar that shows what the clothing looks like. Katie’s Closet is like having a personal stylist at the tips of your fingers. The app allows women to look chic and trendy, while obtaining their desired look. Katie’s Closet allows women to receive instant styling using their own wardrobe, at a very minimum cost, that gives women an effortless but glamorous lifestyle.

Neil Christopher
Psychology
Faculty Sponsor: Dr. Jessica Rhodes
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.

Effects of Exercise on Stress and Cortisol in Athletes

Research has demonstrated that exercise helps lower stress. The aim of the present study was to examine the impact of exercise on cortisol levels following varying levels of exercise among college athletes. Methods: 30 athletes (15 men, 15 women) were assigned to one of three conditions: no exercise, light exercise, and moderate exercise. Measurements included the Trier Social Stress Test (TSST), cortisol (via saliva sample), and the State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA; a measure of subjective stress). Results: The hypothesized Cortisol X Exercise interaction approached significance (F(2,26)=2.4, p=.12, η²=.15), while the STICSA X Exercise interaction was not significant (F<1, p>.05). Conclusion: Exercise differentially reduced subjective (STICSA) and biological (cortisol) stress. One explanation for this pattern of results could be due to the relationship between cortisol and arousal.
Jonathan Clark  
Marketing  
Faculty Sponsor: Dr. Robert Badowski  
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.

Treather App: Making Road Travel Safer

Treather is an app that combines mapping and weather. Its purpose is to simplify traveling during times of inclement weather conditions. Essentially, the user enters their desired destination, and Treather will give a detailed description of the weather and road conditions along the travel route. This allows travelers to know what lies ahead for them, and makes car trips easier and much more safe. The average American drives 13,500 miles per year. Treather’s goal is to create a safer way to get from point A to point B. It offers something that has not yet been offered in the application world. A premium version will also be offered on the app store that will give extra traffic and weather updates and will have no ads. Since there are no other apps like it, Treather is expected to be very successful and receive many downloads.

Emily Connell  
Psychology  
Faculty Sponsor: Dr. Sandra K. Webster  
McKelvey Campus Center Witherspoon, 12:30-1:30 p.m.

The effects of sugar on self-control and memory

Sugar has been thought to be the go to pick-me-up when trying to complete an exhausting task, but research has thought otherwise. The purpose of this study was to examine the effects of sugar on self-control and working memory. Twenty undergraduate and post graduate students (ages 18-35) completed a self-control task by naming the color of a word or the name of a word as quickly and as accurately as possible, then complete a working memory task that asked them to remember a set of three words while correctly identifying if a math equality was correct or incorrect. It was hypothesized that those who were given sugar would have an increase in working memory and a decrease in self-control when compared to those who were given an artificial sweetener. The results showed that self-control was significantly suppressed by sugar within the Stroop tasks completed, when self-control was needed. There was no significance between artificial sweetener and sugar in the working memory task.

Alexander Cronin  
Biology  
Co-author: Savannah Sutherland  
Faculty Sponsor: Dr. John Robertson  
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.

Structure of the Pyloric Cecum of the Paddlefish (Polyodon spathula)

Paddlefish (Polyodon spathula) are native to North American river systems, including the Ohio River. These filter-feeding plankton-eaters can grow to lengths of over 5 feet and more than 100 pounds. Paddlefish and sturgeons make up the chondrostean fishes (order Acipenseriformes) – an ancient clade that evolved near the base of the vertebrate tree. The pyloric cecum is a unique, pre-intestinal digestive organ in fishes; great diversity is seen in the structure of the pyloric cecum in various fish species. While known to have some secretory and absorptive capacity, the function(s) of this organ remains an open question. In this study, we report on the basic anatomy and tissue structure of the paddlefish pyloric cecum. Basic morphological measures, relationship of the pyloric cecum to the digestive tract, and light microscopy are used to develop a novel description of this mysterious organ in this most remarkable species. Results are interpreted in comparative and functional contexts.
Examining Reaction to Masculine Threat

Many males face situations that call their masculinity into question. The study looked at how men will react if their concept of masculinity is manipulated. Participants took the Bem Sex Role Inventory to measure their adherence to male social norms. Next, participants will receive a hand grip test. They were then randomly assigned neutral or low feedback on the hand grip test. Last, the participant took the Conformity Masculine Norms Inventory to determine their level of perceived masculinity. It is hypothesized that when given negative feedback related to physical strength, men who are more masculine will be more likely to indicate that they conform to masculine norms than men with high masculinity who are given neutral feedback. In contrast, men who are low in masculinity will not be affected by negative feedback and will be less likely to endorse masculine norms overall.

Marketing Plan for Sunset Hills U.P. Church

Fewer people are attending church across the United States due to the social shift away from organized religion. In turn, churches need to go above and beyond to get more members from the community and keep current members donating regularly. A marketing plan is essential today for churches to stay up and running. This plan will explore the marketing plan created for Sunset Hills U.P. Church and the partnering app that will be considered. The plan revolves around social media with assistance in event planning.

Anger and Fear

This January, students from the theatre program had the opportunity to attend the Kennedy Center American College Theater Festival (KCACTF). I was nominated for the Irene Ryan Scholarship because of my performance in A Midsummer Night’s Dream and performed alongside Layne Lueckert, my scene partner, in hopes to obtain the scholarship. We had to prepare two scenes, and I had to prepare a monologue. In this performance for URAC, Layne and I will be presenting one of our scenes, and I will present my monologue. These scenes, from the plays Angels in America and Long Day’s Journey Into Night, are intense and pull on the heartstrings.
Second Chance to Dance

Second Chance is an app that will bring back value to old prom dresses. Users can download this app and sell their old dresses, and other consumers can use this app to buy dresses at a cheaper price. After doing some research, the startup of this app will be fairly simple. Second Chance will be accessible to both Android and Apple users. The reason this app will work and be successful is that there is no other app out there like this. Rather than people uploading and try to sell their old prom attire over Facebook and Instagram, this app will bring all the dresses together and put them into one convenient spot for the consumers. Second Chance will be successful because a lot of people wear these kinds of dresses once and then let them sit in their closet. This app allows people to get some money back for them, and it allows the consumers to get a dress at a cheaper price. This app is what everyone needs, this gives your dresses a #secondchancetodance.

Meal Plan Plus

Most meal plans do not run people through the grocery store to get people acclimated on what to buy. They tell you what foods to eat and do not tell you where to get them or alternatives for them. When people first start watching what they eat and trying to become healthy, they often have no idea what to eat or where to find the foods of choice. This app will help people with their diets and give them a macronutrient calculator to follow to fulfill their needs. The collection of this data was through mainly the internet and also from examining what other fitness apps did not have. This presentation will provide additional details and highlight key factors of the app.

Choice Satisfaction: The Effects of the Construct of Choice on the Satisfaction and Motivation of Individuals

This study examines how the number of choices presented to an individual affects their satisfaction with the choice made and the amount of time it took to make the choice. 20 undergraduate students, ten males and ten females, were asked to make two choices. One choice was between two jelly bean flavors and the other was from 20 jelly bean flavors. After making the choice, they were asked to state their agreement with statements regarding satisfaction. Participants were also timed while making each choice. It was hypothesized that an increased number of choices would decrease satisfaction with the choice and increase the time it took to make the choice. A Repeated Measures ANOVA supported this hypothesis in statistical significance and in magnitude of effect. Qualitative information regarding motivation for making the choice was also collected for each individual after each trial. This information was used to categorize individuals as preference matchers or preference constructors.
Retail Workers in Need of Retail Therapy

This app is called Retail Therapy, but it does not sell clothes. It is an anonymous app, like Yik Yak, where the user signs up with a username and writes posts about experiences at their job. This is for retail workers to vent about their experiences related to customers in the work place. The Retail Therapy app will have a way of making sure companies' names cannot be typed or shared on the app. This way, retail workers can vent about their jobs anonymously and have no fear of getting in trouble for it. They get to share stories and get advice from one another. It is a social media app. The app is a free download. The target audience for Retail Therapy is 18-40, since this is the average age of retail workers. This app is looking to reach 1 million users in the first year and looking to continue to expand and grow in the next five years.

Past Prosocial Self-Efficacy Moderates Past Peer Victimization and Current Anxiety

The purpose of this study was to investigate the relationship between past peer victimization and current anxiety with past prosocial self-efficacy as a moderator. A total of 50 undergraduate college students from rural, western Pennsylvania were given a self-report survey about past peer victimization, current anxiety, and past prosocial self-efficacy. It was predicted that past prosocial self-efficacy would moderate the relationship between past peer victimization and current anxiety at high levels but not at low levels. Findings indicated that at low levels of prosocial self-efficacy, higher levels of peer victimization led to higher levels of current anxiety. There is no such relationship found at high prosocial self-efficacy levels. Further research should explore the means by which prosocial self-efficacy serves as a moderator for peer victimization.

Investigating the Effect of Confusion on Emotion

The purpose of this study is to determine if there truly are different types of confusion and whether there is a typical emotional reaction. 40 undergraduates were assigned to four different task types: control, incorrect information, insufficient information, and clash of expectations. They then rated their emotional response with respect to pleasure, arousal, and dominance in addition to relevant knowledge emotions. The confusion conditions produced differences in pleasure and arousal. There was also a statistically significant relationship between facial affect and condition; participants in the confusion conditions expressed more visible confusion than those in the control condition. However, while facial affect demonstrated confusion, the self-report scores did not.
Generational Attitudes Towards Democracy in South Africa

This research hopes to explain reasons for dissatisfaction with democracy in South Africa, identify what factors can predict these feelings, and categorize like-minded respondents into predictable groups of dissatisfied democrats. Of particular concern is the impact of the Born Free Generation on democratic satisfaction and regime performance variables. Using multilinear regression, crosstabs analysis, and means comparisons, those with negative personal experiences were found to be the key determinant of government disapproval and in turn democratic satisfaction. Age did show some variance in the analysis, but was at best only loosely related to dissatisfaction in that younger South Africans showed a tendency to report worse personal experience scores. The Born Free generation does not hold significantly different values and feelings from their older counterparts, and any significance found in other research is likely the cause of another variable which happens to coincide with age.

Edward’s Business Plan Scholarship Winner

Business Administration
Faculty Sponsor: Brian Petrus
Patterson Hall 107, 1:45-2:00 p.m.

Edward’s Business Plan Scholarship Winner

Development of a full-fledged Business Plan containing the following information:
• The business name, logo, location, legal form (sole proprietorship, partnership, corporation) and description of the business and associated activities.
• A full description of the product or service. Products must be new or substantially improved.
• An External Macro Environmental Assessment (competition, demographics, lifestyles).
• A Marketing Plan (overall business concept, target customers, product or service pricing, promotion, product or service distribution, sales forecasts, projected customer traffic).
• A Resource/Operations Plan (how the initial cash investment will be utilized - initial inventory, continuing operational expense projections, employee staffing needs, taxes, etc.).
• Projected Financials - Annual income statements, balance sheets and cash flow statements projected for three years.

Comparing the methods and attitudes of teachers in high-needs school in the United States and the Dominican Republic

Schools in areas of socioeconomic need are often lacking the resources that schools in more affluent regions possess, which results in a disparity in students’ achievement and differences in quality of instruction. This inequality is commonly referred to as an “opportunity gap.” The purpose of this qualitative study was to compare educational perceptions of teachers in high-needs schools in the Dominican Republic to those of teachers from the United States. The researchers administered a brief questionnaire to a small sample of teachers in both countries in order to evaluate their school’s needs and how the teachers meet students’ needs with limited resources. Teacher responses were analyzed using open coding. Based on the results, we seek to inform others about the state of the education system.
in the Dominican Republic and discuss teachers’ attitudes about recent changes to that system, as well as compare perceptions to those of teachers in the United States.

Sean Evanick
Music Performance
Co-authors: Vincent Buell, Nikalas Guadagnino, Timothy Hering, Courtney Labritz, Ian Ollila, Brianna Richey
Faculty Sponsor: Dr. Timothy Winfield
McKelvey Campus Center 1st floor, 9:30-9:45 a.m.

**Westminster College Trumpet Ensemble**

The Westminster Trumpet Ensemble will be performing two pieces. One of these pieces will be “Hornpipe” by G. F. Handel, written in the Baroque Era. The second piece is “Conquest” by Erik Morales. This piece was originally written for the University of Alabama Department of Music Trumpet Studio directed by Dr. Peter J. Wood.

Sean Evanick
Music Performance
Faculty Sponsor: Dr. Timothy Winfield
Wallace Memorial Chapel, 2:20-2:40 p.m.

**Trumpet Sonata by Paul Hindemith 1939**

I will be performing Paul Hindemith’s Trumpet Sonata (1939). Paul Hindemith was born November 16, 1895, and died on December 28, 1963. He was a very inventive German composer, violin and viola teacher, as well as a conductor. He is famous for his works for Viola, Violin, and orchestra.

Emily Eyler
Theatre
Co-author: Nicholle Clayton
Faculty Sponsor: Dr. Terry Jachimiak
Beeghly Theater, 9:45-10:00 a.m.
Funding Received from the Drinko Center

**Irene Ryan Audition Performance**

The Irene Ryan Scholarship is a nomination given to aspiring actors who have shown promise in the acting field. I was nominated for my role in *A Midsummer Night’s Dream* as Hermia. For the audition, my partner and I had to prepare two scenes (one of which we performed), and I had to prepare a monologue. I chose a scene from *Elemeno Pea*, and my monologue was from *Much Ado About Nothing*. The process, audition and feedback I received were extremely helpful. The feedback helped me rethink how I would approach a monologue. Along with the audition, I did workshops which have given me tools to further my acting abilities.
Lauren Faber  
Music Performance  
Co-authors: Becca Bly, Samantha Connell, Corey McNulty, Jeremy Roberts  
Faculty Sponsor: Dr. Anne Bentz  
McKelvey Campus Center Berlin Lounge, 12:15-1:00 p.m.  

**A Little Bug Music**

“A Little Bug Music” is a musical revue celebrating the Bug! Students of an internship sponsored by the New Castle Lyric Opera to promote Opera in the Schools will present a program full of beautiful melodies from the opera, musical and art song repertoire, complete with bug jokes and dancing. Lots of silliness and fun and appropriate for all ages!

Lauren Faber  
Music Performance  
Faculty Sponsor: Dr. Samuel Barbara  
McKelvey Campus Center Berlin Lounge, 1:30-2:00 p.m.  

**Chamber Singers**

The Westminster College Chamber Singers will perform selections from their spring concert in preparation for their annual choir tour. This year the choir will tour Harrisburg, Philadelphia, New York, and State College.

Gabriella Fabish  
Criminal Justice Studies  
Faculty Sponsors: Dr. Kristin Park and Dr. Kristenne Robison  
McKelvey Campus Center Witherspoon, 8:30-9:30 a.m.  

*Funding Received from the Drinko Center*

**Confronting the Overlook: Speaking Out and Uncovering the Relationships Between Sexual Violence and Substance Abuse**

The issues and consequences surrounding sexual violence and substance abuse have been felt at both the individual and societal level. However, despite the knowledge of their intertwinement, the nature of their relationship has yet to be fully examined and understood. Through reexamination of old data and the contribution of new, this study's findings have uncovered various, genuine relationships between histories of sexual violence and abuse of substances in survivors—including substance use leading to sexual violence, sexual violence leading to substance use, loss of identity, using to cope, loss of trust, re-victimization, and more. By interviewing women receiving services, the study was able to observe the relationship of assault and addiction first-hand from the women who have experienced them both. Analyzing the information received by these survivors will be able to supplement existing data and assist researchers in discovering the authentic links between these circumstances.
Homeward Bound

Homeward is a pet tracking app that will correspond with a microchip that will be implanted into the user’s pet. Once a microchip has been implanted, the user will make a profile on the app and will link their pet’s chip to the app. This will then send a satellite transmitted signal to the app, allowing the user to see a real-time location of their pet. This will be useful for animals that like to wander away, or for those who are worried about losing their pet. There will be features within Homeward that will allow for the user to set a pet safe zone, the app will then send a push notification to the user’s phone, letting them know their pet has left the safe zone. This feature will hopefully stop the pet from getting too far away from home, allowing the owner to follow their pet home!

“Velo”... Baseball’s Future Use of Technology

“Velo” is a universal baseball smartphone application for baseball coaches and players to record pitch counts, pitching sequences, exit velocities, and individual player bios. Velo even has an electronic scorebook within the app. Current baseball apps do not have all of these features in one app. By combining all of these applications into one, it will overpower every other baseball app on the market. Technology is taking over the world more and more every day, so why not take it the game of baseball to organize and analyze statistics on your smartphone in a more structured fashion. After logging in, the user can access all of the features in the app and previous game statistics of individual players and the team as a whole.

Costumes for A Midsummer Night’s Dream and the Design Process

I took my costume design for Theatre Westminster’s production of A Midsummer Night’s Dream to KCACTF, the Kennedy Center American College Theatre Festival, in early January. This was to have it critiqued by respondents who have experience in costuming for professional theatre. Now I want to share the design I finalized as well as answer questions about the design and building process. I believe that the arts can gain more support and appreciation when more information of the artistic process is explained to those outside the field.
Investigating The Spatiotemporal Distribution Patterns of PCID2 between the Nucleus and the Centrosome

The nucleus is the control center of the cell, containing all the cell’s genetic information. Because of its important role, the nucleus has a structure controlling nuclear import/export. This structure, called the Nuclear Pore Complex, is an octagonal arrangement of proteins that can control the movement of molecules across the nucleus. CRM1 is a protein that can recognize the Nuclear Export Signal on macromolecules and interact with the nuclear pore complex to facilitate export from the nucleus into the cytoplasm. CRM1 is also localized to the centrosome to serve additional roles. Our study is focusing on a protein called PCID2 that is known to associate with CRM1 at the nucleus and is also found at the centrosome during specific phases of the cell cycle. We hypothesize that PCID2 is shuttled to the nucleus as a part of the CRM1 complex. Preliminary data show that when CRM1’s function is inhibited, PCID2 expression is decreased in the nucleus and increased in the centrosome.

Computer Science Outreach and Study: Difference in Interest and Aptitude Raised in Elementary Students through Computer Science Unplugged as Standalone Learning Activities and Activities Supplemented with Lectures

This project contributes to the research done on the collection of computer science learning activities called Computer Science Unplugged. Specifically, it will compare two methods of teaching Computer Science Unplugged: as standalone learning activities and as learning activities supplemented with lectures. A comparison between students’ interest and aptitude in computer science in both the lecture and non-lecture group will be explained in an oral presentation.

Juvenile Solitary Confinement: Perceptions of Residential Placement Employees

Solitary confinement is a hotly debated topic amongst individuals interested in scholarly criminal justice studies research. Multiple studies have been done, looking at the consequences of solitary confinement, such as mental, physical, and societal effects; however, this study examines the viewpoints of the employees at a placement facility, something not done in these other studies. This was done through Q Methodology, where 30 individuals sorted statements on solitary confinement by the extent to which they disagreed/agreed with them. Demographic data was also recorded. The data was then ran though PQ Method, which resulted in the emergence of three factors. The distinguishing statements of these factors were then qualitatively analyzed to understand them. The three factors that emerged were named Solitary Confinement: A Tool to Change Rule Breaking Behavior, Solitary Confinement: Victorizing Those in the System, and Solitary Confinement: A Tool for Deterrence.
2-1-1 Caller Demographics

The PA 2-1-1 Southwest system is a non-profit information program that provides resources and assistance in finding the appropriate human services for everyday needs and crisis situations. The services provided are available to those living in the Allegheny, Armstrong, Beaver, Butler, Fayette, Greene, Indiana, Lawrence, Mercer, Washington, and Westmoreland counties. PA 2-1-1 is partnered with the United Way of Southwestern PA and they collect information on callers to use the data to improve the quality of their referrals and meeting their clients’ needs. We will be analyzing the demographics of a given subset of callers who use this service and determine if there is an association between the primary reason for calling and basic demographic information.

Hammurabi’s Kingship, Conquest, and Legal Code

In the 18th century BCE, King Hammurabi created the Babylonian Empire by expanding his lands to encapsulate the entire Tigris and Euphrates river valleys throughout his reign. The laws and characteristics of the ancient Babylonian imperial nation illustrate a society governed by restorative justice and the equal enforcement of the central law code. My paper argues that the law code of Hammurabi allowed him to uphold a just society and served as the legitimization for his conquests. Hammurabi’s rule spanned forty-three years, during which he exceeded the achievements of any other ruler in the history of the ancient Near East. From the creation of a regulated irrigation system to the 282-clause law code that he established to define powers of the king, judges, governors, and priests, Hammurabi’s accomplishments covered every facet of life and brought wealth and prosperity to his empire. Hammurabi conquered more nation-states than any other throughout history, and he was able to do so through his ability to decisively navigate through international relations, utilize economics to strengthen the empire, and establish himself as a strong and infallible leader.

Communication in the Work Place

This study explores how interpersonal communication can help a business prosper and what improves and negatively affects interpersonal communication. This research considers how interpersonal communication can improve or impair a work team. In addition, interpersonal communication is explored as an avenue to help improve small group communication, whether that is in a staff meeting or a meeting with clients.
ParkGeek
ParkGeek is an innovative app that allows users to find parking spots for their cars, trucks, and motorcycles. With a touch of a button and the ability to use your location on your device, the app will find a parking space, wherever you are. The technology behind it will be sensors that are implanted into individual parking spots at places that usually are extremely busy and hard to find spots. Those places include college campuses, concerts, sporting events, and malls. The app will also include directions that allow you to pin point the spot and will provide you with quick directions as to how to get there.

Chelsea Gregley
Psychology
Faculty Sponsor: Dr. Sandra K. Webster
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.

The Effects of Psychosocial Stress on Recognition Memory in Women

This study tested the effects of psychosocial stress on recognition memory in women. Psychosocial stress was induced by the Trier Social Stress Test. The experiment proposed that acute psychosocial stress from the Trier Social Stress Test would increase recognition memory in women. The experiment consisted of two groups where one group, the experimental group, take the Trier Social Stress Test and the other group, the control group, would take a placebo Trier Social Stress Test. This study consisted of three parts: acquisition, stress or placebo portion, followed by the recognition task. Participants had their heart rates taken periodically to measure their levels of stress. The data was recorded, analyzed, and graphed. The analysis shows the means for each group and the amount of words recognized. The results were insignificant in recognition between new or old words between each group.

Rhiannon Griffiths
Theatre
Co-author: Victoria Volkay
Faculty Sponsor: Dr. Terry Jachimiak
Beeghly Theater, 9:15-9:30 a.m.
Funding Received from the Drinko Center

KCACTF Irene Ryan Mock Audition

The Kennedy Center American College Theatre Festival is a yearly conference for all aspects of the theatre. There are presentations, performances, auditions and workshops. This past winter, I went as a nominee for the Irene Ryan Acting Scholarship. I had to prepare two short scenes with a partner and one monologue. The audition is also a learning experience, as nominees receive feedback on their performances. We will perform pieces chosen for the audition.

Madison Grimes
Marketing
Faculty Sponsor: Dr. Robert Badowski
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.

Hit the Road: The Ultimate Road Trip Planner

Hit the Road will be one of the first apps to combine social media and traveling. Hit the Road will be an app where users will create profiles, and they can browse and save different locations to their profile so that they can plan a road trip later. In addition, users will be able to type in a starting location and a destination, and Hit the Road will be able to show
unique, off-the-beaten-path locations that are close to their route. Hit the Road won't show the typical museums and businesses; it will show the places that are more unique to their tastes, like National Parks, hikes, waterfalls and filming locations for movies or shows. Hit the Road will help users plan the best and most unique road trip.

Anthony Groves  
Computer Science  
Faculty Sponsor: Dr. C. David Shaffer  
Patterson Hall 107, 10:40-10:55 a.m.

**Exploring Altruism in Emergent Behavior of Evolving Cooperative Robots**

We will discuss the results of an experiment using genetic algorithms to evolve teams of simulated robots to perform a task cooperatively, and we examine teams that are encouraged to behave altruistically with teams that are not. Our simulation runs in a spatially and temporally discrete virtual environment. The task is designed to require the teams to cooperate to successfully complete it. The simulation also has pursuer robots that pursue the cooperative robots and inhibit their ability to perform the given task. Each cooperative robot can save the other cooperative robots from the pursuers, allowing altruistic behavior to emerge. We use two different types of teams, one that is encouraged to behave altruistically from its genetic algorithm and one that is not, to experimentally analyze whether a team is more effective if altruism is a forced behavior instead of an emergent behavior. We will present an analysis of emergent self-organization in the resulting teams.

Julianne Halmo  
Psychology  
Faculty Sponsor: Dr. Sandra K. Webster  
McKelvey Campus Center Witherspoon, 12:30-1:30 p.m.

**The Effect of Mindset on Task Performance**

This study was designed to determine the effect of mindset on task performance, in this case, recognizing a set of words. A population of eighteen female undergraduate Westminster College students were randomly assigned to a mindset. Participants viewed 40 neutral valence words, one at a time, and were asked to correctly recognize as many of the 40 words as possible out of 80 neutral valence words shown. The neutral mindset group immediately began the assigned task. The first treatment group had a positive mindset, by saying that they were going to do well on the assigned task, then completed the task. The second treatment group had a negative mindset, by saying they were not going to do well on the assigned task, then completed the task. It is expected that the positive mindset group would recognize the most amount of words and the negative mindset group would recognize the least amount of words. Future studies should examine gender differences and power of mindset.

Alyssa Hampton  
Neuroscience  
Faculty Sponsor: Dr. Deanne Buffalari  
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.

**The Effect of Yohimbine on Anxiety in Food Deprived and Fed Animals**

Yohimbine, a drug known to cause stress-related neural activity, is commonly used to model anxiety in animals. However, other testing has shown yohimbine to cause place preference rather than place avoidance, which is inconsistent with the actions of a stressful drug. This study investigates whether food deprivation impacts the effect of yohimbine on anxiety in 32 male Sprague Dawley rats. Two behavioral procedures were used to ask this question. The first analyzed food deprivation on stress behavior after an injection of yohimbine in an open field apparatus. The second used an elevated plus maze model to investigate if food deprivation influenced yohimbine-induced anxiety behavior. The results of the studies support the idea that food deprivation reduces stress and anxiety. These data
suggest that the energetic state of the animal might be an important factor in evaluating different stimuli or drugs that affect stress.

Amelia Hartzell
Public Relations
Faculty Sponsor: Dr. Brittany Rowe-Cernevicius
McKelvey Campus Center Witherspoon, 8:30-9:30 a.m.

A multi-dimensional analysis of large corporation’s Twitter accounts and the alignments with their mission statements and CSR initiatives

This study explored how companies, Patagonia, Seventh Generation, and Burt’s Bees, promote their corporate social responsibility initiatives on Twitter. In addition, the study looked at how well their corporate social responsibility initiatives were being perceived by the media. Through the use of a qualitative and quantitative analyses, the study was able to determine how congruent the companies’ CSR initiatives were to their mission statements. The findings showed that some companies are more dedicated to communicating their CSR initiatives to their Twitter followers than other companies. Not only are companies promoting CSR initiatives congruent to their mission statements, but they are also promoting incongruent CSR initiatives unrelated to their company. Further research could look into seeing how their consumer base reacts to their CSR initiatives.

Morgan Hartzfield
Business Administration
Co-authors: Carina Burns, Jarod Forsythe, Sarah Snyder, Shelby Wood
Faculty Sponsor: Keith Bittel
Patterson Hall 105, 12:55-1:10 p.m.

One Campus. One Town. One Connection.

CCC is a project designed to form relationships between students of Westminster College and the townspeople of New Wilmington, PA. The goal is to establish a mutually beneficial relationship in which students and community members can work alongside one another. Members of Enactus have worked closely with the New Wilmington Chamber of Commerce to create a website designed to facilitate communication. Community members can post projects that they need volunteers for and students can sign up to help. This enables businesses to get the assistance they need and helps students to fulfill community service requirements. Along with the website, CCC members have designed a brochure and various marketing materials to spread the word about this project. The brochure encompasses all of the information necessary for the townspeople to understand what Enactus is and what we can do for them. This project is one that will be ongoing and will eventually be able to sustain itself within the community.

Erin Hassett
Environmental Science
Faculty Sponsor: Dr. Diana Ortiz
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.

Assessment of risk and environmental factors related to the occurrence of human Lyme disease cases in western Pennsylvania

Lyme disease, a tick-borne illness caused by the bacterium Borrelia burgdorferi, is transmitted through the bite of an infected blacklegged tick. When detected early, Lyme disease can be treated with antibiotics. If left untreated, the disease can spread to the joints, heart, and nervous system. In the last few years, Pennsylvania has led the nation in confirmed cases of Lyme disease, but there are complications due to a lack of consensus among researchers and healthcare practitioners in many critical areas, such as diagnosis and treatment. With the collaboration of Dr. Tuesdae
Stainbrook, an infectious disease specialist in Dubois, PA, we were able to obtain 109 patient records and determine the characteristics of Lyme disease in that region of western PA. Additionally, environmental risk factors were assessed by analyzing spatial distribution and landscape characteristics of recently diagnosed Lyme disease patients using geographic information system (GIS) software.

Rebecca Haynik
Psychology
Faculty Sponsor: Dr. Sherri Pataki
Patterson Hall 106, 12:30-12:45 p.m.
Funding Received from the Drinko Center

**The Impact of Affective Content on Memory**

This research examined the impact of emotional state on the ability to remember. The experiment studied the influence of affective content on source and working memories. There were ninety Westminster College students that participated in this study. Participants were randomly assigned to three affective conditions (positive, neutral, and negative) and completed a source and a working memory task. The memory tasks were counterbalanced to control for order. Source memories were enhanced by neutral content, moderately enhanced by negative content, and hardly impacted by positive content. There were no differences in working memory recall between conditions. Two separate one-way ANOVAS were used to analyze the results of each memory test. The results of this experiment will be applicable to the study of different kinds of memory and how humans remember different types of information under various affective states.

Tyler Heintz
Physics
Faculty Sponsor: Dr. Craig Caylor
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.

**Measuring Band Gaps in Semiconducting Materials**

In solids, there exists a band gap between the valence band and conduction band of quantized, or discrete, energy states. Semiconductors have small band gaps which allow electrons to make transitions from the valence band to the conduction band as a result of thermal energy. This in turn allows for conduction of electricity through the material. We measure the temperature and the voltage across a diode of semiconducting material at a constant current. A diode is made of semiconducting material and has low resistance to flow of electricity in one direction and high resistance to flow in the opposite direction. Over certain temperature ranges and with constant current through the diode, the relation between temperature and diode voltage is essentially linear. From the temperature-voltage curve, we determine the band gaps of germanium and silicon.

Robert Hellier
Biology
Faculty Sponsor: Dr. John Robertson
McKelvey Campus Center Witherspoon, 12:30-1:30 p.m.
Funding Received from the Drinko Center

**Quantifying Electrosensory Ampullae on the Operculum of Developing Paddlefish**

Paddlefish (Polyodon spathula) are freshwater, filter-feeding fish with a highly developed electrosensory system that the fish use to interact with their environment. The functional units of electrosensation are ampullae of Lorenzini; these structures occur in large numbers on the head, operculum and rostrum of the paddlefish. In order to assess changes in numbers of ampullae as young fish grow, this study quantifies the number of ampullae specifically on the operculum.
of several size classes of juvenile paddlefish. Surface pores associated with the ampullae were imaged microscopically after Sudan Black B staining of isolated opercula, and pores were counted using an image analysis program. Better understanding of the development of the paddlefish electrosensory system can contribute to greater appreciation for the early life history of this species, which could be significant in conservation efforts.

Andrew Henley  
History  
Faculty Sponsor: Dr. Timothy Cuff  
Patterson Hall 105, 10:15-10:30 a.m.  
Funding Received from the Drinko Center

The 1918-19 Influenza Pandemic in Mahoning County, Ohio

In the first decades of the 20th century, the 1918–19 Influenza Pandemic struck the United States of America, killing an estimated 675,000 persons. Within Mahoning County, Ohio alone, more than 1200 people died from influenza-related causes during the pandemic. Within Youngstown, the county’s seat, subgroups of European-immigrant neighborhoods stood beside communities of European-Americans of long standing. Utilizing a database of death certificate data, from Mahoning County during the fall of 1918, this study identifies geographic patterns of influenza-related mortality across the county. Utilizing GIS-software to plot these data, this study identifies the correlations and spatial patterns between mortality and victim characteristics. As we near the centenary of the pandemic, this study will add to the pattern of mortality, which has only been documented for a limited number of towns and cities through contemporary means to date.

Bridget Herlihy  
Neuroscience  
Faculty Sponsor: Dr. Deanne Buffalari  
McKelvey Campus Center Witherspoon, 8:30-9:30 a.m.

The Effects of Methylphenidate and Ethanol on Fear Memory

Research show that college age students are at risk for alcohol use, and there is also prevalent nonmedical use of stimulant-drugs that enhance attention, such as methylphenidate. However, despite consumption of both drugs, there is little research on the effects of their interaction on cognitive abilities. The research on these drugs individually shows that they have opposite effects on memory, yet other research suggests that in combination, they cause severe deficits in working memory. This work sought to ask whether similar deficits would be seen when testing fear memory after injections of methylphenidate and ethanol. These experiments aimed to identify doses of each drug that might affect memory without having dramatic effects on locomotor activity. We found that the dose range of 0.5-1 g/kg of EtOH does not impair motor function, and 1.5mg/kg MPH did not significantly increase motor activity. Future research will test how each of these drugs might affect recall of fear memory.

Zachary Herndon  
Psychology  
Faculty Sponsor: Dr. Sandra K. Webster  
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.

Working Memory

This experiment will test the effects of chewing, scent of spearmint, and chewing spearmint on working memory within a group of 20 college students. Each part has a different pattern that the participant will be asked to take 2 minutes to memorize, and after a one-minute rest period, the participant will recall as much as they can about the pattern. The first group of participants will take the test with no treatment, the second group will smell spearmint while they study the pattern, the third group will chew popcorn while memorizing the pattern, and the fourth group will chew spearmint
gum while they memorize the pattern. I think I will find that chewing the gum will produce the highest scores, followed by the spearmint smell, then chewing, and lastly the control with the lowest scores. The practical reasoning behind this research is that it can be applied for students to use as a way to better retain information well studying.

Ava Hoag
Physics
Faculty Sponsor: Dr. Craig Caylor
McKelvey Campus Center Witherspoon, 12:30-1:30 p.m.

The Friction Between Interleaved Pages

It is surprising how difficult it is to pull apart two books after their pages have been interleaved. This is because the friction between the individual pages of the books is able to match a lot of force before they are pulled apart. I have measured how hard one needs to pull on the interleaved books before they begin to separate. This measurement is the maximum friction force. The strength of the friction force depends on how many pages are in the books and how close the edge of the pages of one book are to the other book’s spine. The more pages in each book, the stronger the friction force. The closer the pages of one book are to the other book’s spine, the stronger the friction force. I have compared the results that I have gotten with the results from previous experiments done involving interleaved books and friction.

Troy Holden
Psychology
Co-author: Anna Brock
Faculty Sponsor: Dr. Mandy Medvin
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.

The Effects of Gender and Age on the Moral Reasoning of Undergraduate Students

The current project was designed to examine the influence of social domain theory on the responses of undergraduate students when given a hypothetical moral dilemma. Social domain theory attempts to explain morality in respect to generalizable norms, based on views of welfare, fairness, and rights that regulate social relationships (Smetana 2006). We were interested in finding differences between responses using moral, social conventional, and personal judgments due to year in college and gender. Based on Smetana (2006), we hypothesized that we would observe little to no gender differences in answers. We also hypothesized that social conventional judgment response scores would decrease as age increases due to a reduction in the effects of social pressures. Our survey, based on the work of Lisciandra, Postma-Nilsenovà, and Colombo (2013), prompts the participant to quantify to what extent they agree or disagree with each statement. Findings indicated support for the hypotheses.

Lindsay Homan
Chemistry
Faculty Sponsor: Dr. Helen Boylan
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.
Funding Received from the Dranko Center

Analysis of Trace Metals in Hair Using ICP-OES and Chemometrics

Trace metal concentrations in hair are biomarkers for human health, nutrition, and environmental exposure. Deficiency or excess of certain metals can cause many common chronic diseases. Hair metal concentrations are a non-invasive and accurate way to test biological samples. A survey of the literature showed there are many different trends in hair samples that are significant. For example, higher trace metal concentrations of Cd and Pb are correlated with dyslexia and higher Cu, Mn, and Se concentrations are correlated to being vegetarian (Sukumar, 2002). Approximately thirty hair samples were collected along with surveys of each individual that donated hair in order to search for trends within the
Westminster student population. Hair samples were digested using nitric acid and analyzed using inductively coupled plasma optical emission spectroscopy. Advanced statistical techniques were used to study the trends in the data.

Stephanie Homitz  
Chemistry  
Faculty Sponsor: Dr. Helen Boylan  
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.  
Funding Received from the Dranko Center

Analysis of Pet Food by LIBS, ICP-OES, and Chemometric Methods

American consumers spend upwards of $60 billion annually on their pets and expect quality pet food products, therefore knowing and controlling what is in pet food is an important aspect of this industry. A wide variety of dog (n=31) and cat (n=17) food samples were analyzed using Laser Induced Breakdown Spectroscopy (LIBS) and Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES) for this project. ICP-OES requires extensive sample preparation but provides accurate elemental content. LIBS involves no sample preparation but produces complex spectra with minimal quantitative information. Chemometric methods, including data preprocessing and principal component analysis were applied to these spectral data sets using Solo by Eigenvector Research, Inc. Commercial lab results for select samples were also used for comparisons. Goals of this work are to utilize the LIBS data to create a predictive model for elemental content and to discriminate between cat and dog food.

Kia-Anne Howe  
Mathematics  
Faculty Sponsor: Dr. Natacha Fontes-Merz  
Patterson Hall 108, 1:20-1:35 p.m.

Skyscraper Puzzles

This presentation will address the topic of the skyscraper puzzle. This puzzle is a square grid number puzzle much like the Japanese puzzle, Sudoku. In the rules of the Skyscraper puzzle, each number must be placed in every row and column exactly once. However, every row and column has additional restrictions on the order in which the numbers must be placed. Those restrictions are based on hints placed around the outside of the puzzle. This presentation addresses the mathematics involved in solving the Skyscraper puzzle, some mathematics behind the creation of the puzzle, and some interesting discoveries about puzzle hints.

Rachel Huff  
Mathematics  
Faculty Sponsor: Dr. Carolyn Cuff  
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.

Data Mining in Institutional Advancement

Data mining is a technique that combines skills from several disciplines, including machine learning and database studies from computer science, mathematical and statistical modeling, and domain expertise of the database. In this project, data mining techniques are applied to a database maintained by the office of Institutional Advancement at Westminster College, a non-profit organization. This database consists of records of every person or organization who has donated to Westminster College along with everyone who has graduated from the college. The database will be examined and data extracted to identify factors that might indicate level of donation. This preliminary work explores data mining algorithms that might be used to discover patterns and knowledge from the Institutional Advancement database.
Keilah Ireland
Mathematics
Faculty Sponsors: Dr. Carolyn Cuff and Dr. Natacha Fontes-Merz
Patterson Hall 107, 10:15-10:30 a.m.

Does Cat Food Differ from Dog Food?

The purpose of this research is to uncover the mathematics behind different methods of cluster analysis and to determine the optimal method to use for real world data sets. We will discuss what cluster analysis is and the different methods that are used to cluster data, and we will use each of those methods to analyze a data set. By comparing and contrasting the different outputs of these cluster methods, we will be able to identify strong cluster structures and determine when to choose one model over another.

Christopher Israel
Business Administration
Faculty Sponsor: Dr. Robert Badowski
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.

Brilliant Budget

During the course of 2 decades, the idea of saving and budgeting money has dramatically changed. The frugal habits of our grandparents have become a rarity in comparison to the spending habits of today’s individuals and households. As we see more college students take on large amounts of debt, it has become very apparent that this is the time to revert back to the idea of saving and budgeting money for our futures. Brilliant Budget is a user-friendly app designed for all ages that will create an efficient way to lay out our monthly expenditures, while at the same time socking away some money for larger, future investments. The app is linked to the user’s bank account therefore creating an accurate read of the money available to budget and utilize properly. With Brilliant Budget, you can become a bright saver.

Troy Jackson
Broadcasting and Media Production
Co-author(s): Charles Borges, Brad Kolesar, Emiley Westfall, Justin Wilson
Faculty Sponsor: Bradley Weaver
McKelvey Campus Center Mueller Theater, 1:30-2:00 p.m.

Sneak Peek: Premiering the 2017 Documentary Trailers

Five capstone students launch their documentary projects following a semester of research and pre-production. Trailers offer a first look into the stories showcasing each of their projects. Producers present trailers to the audience for feedback and reaction. Students will analyze feedback to inform and shape their productions heading into the next semester. Featuring: “Tiny Living—WC’s Tiny House Project” by Justin Wilson; “Tutus, Pink Shoes, & Baby Blues—An Intimate Look at International Adoption” by Emiley Westfall; “Ghost Witch—the Hunt for Mary Black” by Troy Jackson; “Hitting the Redline—A Behind the Scenes Look of the Pittsburgh Vintage Grand Prix” by Brad Kolesar; and “A Chance to Play—in the Dugout with the Miracle League” by Charlie Borges.
Fever: 48 Hour Award Winning Short Film

A man, Vince France, goes through the final stages of an illness and begins to hallucinate. This film, “Fever,” is produced by Dunndo Studios for the 48 Hour Horror Film Project in Pittsburgh. Acted by Doltyn Snedden and Brooke Novotny, “Fever” won multiple awards including Best Actor (Doltyn Snedden), Best Sound Design, and Best Musical Score.

The Help You Need to Prepare for Travelling

Research is being conducted to help with the creation of a new travel app. The app will allow customers to enter the place or places to which they are travelling, nationally or internationally, as well as the dates they are travelling there. In return, the app will tell the users the current weather and the usual weather of the time they will be there. It will give suggestions of items users might want to pack, the normal attire of the people in the area at the time they are travelling there, and ideas of things to do and places to stay. Additionally, the app will have a place for users to make a list of what to pack by “adding” items that the app has suggested or typing in other items. The research for the app includes research on competition, what they offer, and their pricing. Also, how to get all the information onto the app, partnership options, the cost of creating it, its pricing, how it will generate money, and how to advertise.

Never an Absolution: Nazi Persecution of Homosexuals and its Legacies

Before the rise of National Socialism in the 1930s, Berlin and other German cities boasted large, thriving LGBT communities. It even seemed likely that Section 175 of the German penal code, which outlawed homosexuality in the nineteenth century, would soon be repealed. Why then, has Germany still not fully legalized gay marriage? What is the legacy of the Nazi persecution of homosexuality? Why were homosexual victims of the Holocaust not even recognized until the turn of the century? This research seeks to illuminate the issues raised by these questions through the examination of Nazi laws and propaganda, the destruction of the gay community in Nazi Germany, and the impact of this persecution that is still being felt today.
Katelyn Jones  
Education  
Co-authors: Amanda Magnotti, Jennifer Rodgers  
Faculty Sponsor: Dr. Allison Dubois  
Patterson Hall 205, 9:00-9:15 a.m.  
*Funding Received from the Drinko Center*

**The Cost of Caring: Developing Resiliency Skills in Pre-service Teachers**

Teachers must acquire a number of skills preparing them for the profession. Research has found that young, inexperienced special educators are twice as likely to leave the profession as compared to their more experienced colleagues (Billingsly, 2004; Singer, 1993). Teacher training programs provide pre-service teachers with myriad resources regarding curriculum and instructional pedagogy, but rarely address the concept of childhood trauma or the successful implementation of coping mechanisms when faced with this trauma material. Educators must have training and experience in dealing with students affected by a multitude of risk factors, which include trauma and poverty. Children living in poverty are exposed to a number of factors detrimental to their healthy development. These risk factors include exposure to greater levels of violence and frequent residence changes, higher risk for having a child with a disability, and limited nutritional and medical options.

---

Sumer Kassim  
Mathematics  
Faculty Sponsor: Dr. Natacha Fontes-Merz  
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.

**A Variation on The Tower of Lire**

The Leaning Tower of Lire is a common physics problem that concerns stacking blocks of equal mass over a table. The goal is to stack the blocks over the table as far as possible. In this talk, we discuss the problem with a use of different masses and find the combination of blocks that maximizes the total overhang.

---

Kimu Kim  
Business Administration  
Faculty Sponsor: Dr. Robert Badowski  
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.

**BarTab**

BarTab will be an app that brings people and bars together. Having the current location turned on within the app, BarTab will notice that the user entered a bar. This will allow other users to see how many people are in a bar around them, and it will only work with other BarTab users. The app can also be used as a source of social media; users will be encouraged to post drink specials at a bar during any night they are out. Posting drink specials will allow users to earn points within the app that will allow them to level up to higher levels. This feature will let users get special titles under their username. Users can post pictures during their night out to share their experience with others. The photos can be shared as private, to their friends, or public, so that anyone who goes to the bar’s page can see within the app. The app will also allow the user to simply press a button to send out a location of where they are, and Uber or a taxi service will pick them up.
Jeffrey Klinedinst
Psychology
Faculty Sponsor: Dr. Sandra K. Webster
McKelvey Campus Center Witherspoon, 8:30-9:30 a.m.

The Fear of Missing Out (FoMO) increases anxiety levels of young adults

The purpose of this study is to determine how much perceived anxiety is produced by the Fear of Missing Out (FoMO). The subjects of this experiment include 20 undergraduate Westminster College students who will be randomly assigned to either abstain from social media use for 24 hours or use their social media normally. They will be tested using Spielberger’s State-Trait Anxiety Inventory for Adults (Spielberger 1983) once on the first day, and then again 24 hours later either after the treatment or after a normal day’s use. The expected results of this study will show that the treatment group will experience significantly more anxiety than the control group between the two testing sessions. This will show that in the short term, abstaining from social media will produce a higher amount of anxiety in people than what would normally be felt. Further research would examine this phenomenon in the long term and if there is a point in time in which FoMO stops having an effect.

Jarrett Koper
Biology
Co-authors: Lauren Foltz, Kelly Higby
Faculty Sponsor: Dr. Karen Resendes
Patterson Hall 207, 9:00-9:15 a.m.
Funding Received from the Drinko Center

5-Flurouracil disrupts nuclear transport during apoptosis in a calcium dependent manner

Regulation of nuclear transport is an essential component of apoptosis. As chemotherapy-induced cell death progresses, nuclear transport and the nuclear pore complex (NPC) are slowly disrupted and dismantled. 5-fluorouracil (5-FU) and the camptothecin derivative topotecan are linked to altered nuclear transport of specific proteins; however, their general effects on the NPC and transport during apoptosis have not been characterized. We demonstrate that 5-FU disrupts Ran-mediated nuclear transport before the disruption of the NPC. Ran disruption correlates with increased NPC permeability. The increased NPC permeability is dependent on increased cellular calcium, as the Ca2+ chelator BAPTA-AM abolished the effect. While, after 5-FU chemotherapeutic treatment, calcium chelation decreases nuclear pore permeability. 5-FU induced calcium inhibition of nuclear export in HeLa cells increases nuclear topoisomerase in the presence of irinotecan and topotecan.

Kaitlyn Kosarek
Spanish
Faculty Sponsor: Dr. Jeffrey Bersett, Dr. Joel Postema
Patterson Hall 107, 1:20-1:35 p.m.

Peronism para los Descamisados

The Peronista movement, and later Peronista Party, otherwise known as the Jusicialista Party, began taking Argentina by storm in the mid-1940s as a response to the white collar citizens feeling ignored by the government. President Juan Peron made the movement as well as the party famous through his promises and work for the “descamisados,” or the poorer, working class. The party has often been regarded as one of almost a nationalist character, and throughout the years, the presidential candidates belonging to the Peronista Party have won the majority of the elections in Argentina. They have stuck to the original promises of aiding the descamisados with wavering success. This study analyses to what degree various presidents have maintained the Peronista way.
The Power of Spoken Word: Personality Self-Perception in Hispanic and Anglo-American Bilinguals

This study investigated perceived personality traits in Hispanic and Anglo-American bilinguals speaking both Spanish and English. 11 native Spanish speakers and 14 native English speakers completed the 16 Personality Factor Inventory (Cattell et al, 1949) in English and Spanish (version). Spanish language version produced higher self-perceived liveliness and vigilance. Version and L1 interacted on the perfectionism, reasoning, self-reliance, and openness to change. Participants perceived themselves as more reasoning and perfectionistic when completing the questionnaires in their native languages. They perceived themselves as more open to change and self-reliant when answering the questions in their second language. Future research should focus on specific dialectal differences in English and Spanish and cultural biases of populations in order to provide more appropriate translations. Linguistic biases based on cultural differences must be taken into account with psychological research.

How Colleges and Universities Can Utilize Social Media to Increase Enrollment

Social Media is becoming a critical tool in marketing. This study investigates the use of social media in college recruitment programs. Through researching several digital recruitment techniques and practices, this study will give suggestions on how colleges can better reach their target audience, Millennials and Generation Z.

How the aerieREAL campaign impacted the emotional connection young women (aged 18-22 years old) have with the brand

This study addresses the growing problem associated with body image and the media. The research further investigates how companies that use supermodels and digital retouching are capitalizing on these types of advertisements. The primary goal of this project is to explore the aerieREAL campaign and investigate why the campaign has resulted in responses from their key publics. This research will shed light as to how aerie has used the aerieREAL campaign to emotionally connect with women between the ages of 18-22. This research includes several focus group sessions covering the topic of body image. The focus groups will utilize advertisements produced by both aerie and Victoria’s Secret.
Contagious Yawning and Empathy

The purpose of this study was to test the effect of empathy (induced or objective) on contagious yawning. 20 participants from Westminster College were randomly assigned to either feel empathy or remain objective while reading a scenario about a breakup. Then each participant watched a video of 48 different people yawning. The experimenter tallied the total number of times each participant yawned while watching the video. A self-empathy test adapted from Batson and Ahmad (2001) was used to verify the empathy manipulation. Empathy instructions did not significantly increase contagious yawning. The manipulation of empathy was also not successful in the experiment. Future research should conduct the experiment with a larger number of participants and use a procedure that has successfully manipulated empathy.

Plato and St. Augustine: The Old and the Restless

Frederick Nietzsche referred to Christianity as “Platonism for the people”. The majority of Post-modernist philosophers share this sentiment and proceed to quickly write off Platonism and Christianity, claiming the former to be ancient and stale, and the latter to be plagiarism, and bad plagiarism at that. The main culprit for stealing Plato’s thunder, of course, is none other than St. Augustine. But why did Augustine ‘steal’ Platonism? Why do we keep coming back to Augustine and Plato without even knowing it? And why might the fate of all humanity hinge upon Augustine’s answer? This presentation will discuss these questions.

Service Learning and 2-1-1 Call Center

The PA 2-1-1 Southwest system is a call and information center that provides resources and assistance in finding health and human services for everyday needs and crisis situations. PA 2-1-1 is partnered with the United Way of Southwestern PA and is able to identify where United Way can have an impact and where needs are not met. People’s Gas, Duquesne Light Co., International Brotherhood of Electrical Workers, PNC Charitable Trust, and the local county government services are some of the businesses and agencies in their referral list. PA 2-1-1 Southwest serves 11 counties in the state of Pennsylvania: Allegheny, Armstrong, Beaver, Butler, Fayette, Greene, Indiana, Lawrence, Mercer, Washington, and Westmoreland county. Trained specialists are on call 24 hours a day, 7 days a week. This poster explores the differences in presenting needs in these counties.
The Negative Effects Generalized Anxiety Disorder Has on Romantic Relationships

As I struggled through anxiety and panic attacks over the last 3 years, I have researched and realized the impacts these mental illnesses have on the one suffering, as well as the countless loved ones around them. I’ve talked to and been around many who suffer the same issues, and I’ve concluded there is countless evidence and proof that anxiety has a way of taking over your life, swallowing you, making you feel constantly overwhelmed even by small situations, mostly ruining relationships, and leaving you possibly feeling selfish. Romantic relationships are commonly negatively affected on a very personal level. When suffering with GAD, it is easy to center your focus on your health and well-being, making typical, everyday situations in a romantic relationship feel like a hassle or commitment. I will research all the effects this disorder has on couples, emotionally and physically, while incorporating personal experience and insight from professionals in the mental health field.

Emma Lawson
History
Faculty Sponsor: Dr. Timothy Cuff
McKelvey Campus Center Witherspoon, 8:30-9:30 a.m.

A Trial for the World

In researching the Nuremberg Trials that followed World War II, I attempted to answer the question of whether or not the first Trial was a fair trial, or if it was a show trial with convictions pre-determined. By reading through the trial transcripts and analyzing numerous secondary sources on the topic, I found that it was indeed more of a show than a trial. From the biased establishment of the International Military Tribunal and the obstacles the defense was forced to overcome to the unnecessarily extensive press coverage the trials and executions received, every aspect of the trial resembled a show rather than a fair execution of justice. Not much has been published about this view on the trials, as it remains a controversial stance to take on history. This research has revealed a side to the story that many historians are afraid to tell. However, it is necessary to reveal, as this trial set the precedent for international criminal courts, and its true nature must be remembered.

Kailey Liverman
Fine Art
Faculty Sponsor: Peggy Cox
Patterson Hall, Outside Foster Art Gallery, 2:00-2:30 p.m.

Oil Painting

I am a double major in psychology and fine arts, studying to enter the field of clinical psychology and art therapy. Three paintings are from my first Oil Painting class. Two are landscapes and one is a still life.

Kailey Liverman
Psychology
Faculty Sponsor: Dr. Sandra K. Webster
McKelvey Campus Center Witherspoon, 12:30-1:30 p.m.

The Effect of Self-Expression on Stress

The purpose of this research was to test how different types of coping mechanisms were used to recover from a stressful situation. Participants included 20 college volunteers. After a Trier social stress test (TSST), a stress-inducing activity, participants attempted to recover from stress in either a self-expressive activity, such as drawing, or non-self-
expressive activity, such as a simple reading or math task. To measure level of stress, heart rate was taken before the experiment, after the TSST, and after completion of coping mechanism in addition to an assessment of a Perceived Stress Scale (PSS). Results should demonstrate that the self-expressive coping mechanism will significantly ease stress, lower heart rate, and comfort the participant. Self-expressive mechanisms are typically found in therapeutic strategies, such as art therapy where the goal is to allow an individual to express themselves through the creative process to help alleviate trauma.

Marissa Lyerly
Music Performance
Co-author(s): Abigale Senatore, Vanessa Sivie
Faculty Sponsor: Daniel Heasley
McKelvey Campus Center 1st floor, 2:00-2:15 p.m.

Westminster College Clarinet Trio

The Westminster College Clarinet Trio is a student chamber ensemble. We rehearse weekly on a variety of repertoire that showcases the clarinet's unique, warm timbre, and its versatile abilities. We will perform a selection of the pieces we are working on this semester.

Marissa Lyerly
Music Performance
Co-author(s): Maura Kardasz, Ann Riddle, Jordan Sherman
Faculty Sponsor: David Tessmer
McKelvey Campus Center 1st floor, 1:10-1:25 p.m.

Westminster College Woodwind Quartet

The Westminster College Woodwind Quartet is a student chamber ensemble in the School of Music. This group rehearses weekly to prepare a variety of woodwind chamber music. The music we perform varies from traditional woodwind chamber repertoire to arrangements and transcriptions of famous pieces and more modern pieces.

Marissa Lyerly
Music Performance
Co-author(s): Angela Renninger
Faculty Sponsor: Dr. R. Tad Greig and Dr. Timothy Winfield
Patterson Hall 208, 9:25-9:40 a.m.

CBDNA National Small College Intercollegiate Band

Marissa Lyerly and Angela Renninger were selected through an application process to perform in the CBDNA National Small College Intercollegiate Band in the spring of 2017 in Kansas City, Missouri. This ensemble is comprised of students from all over the United States, and it gives these college students the opportunity to learn and perform challenging repertoire alongside other advanced musicians and to bring back useful knowledge for the ensembles at their own institutions. It is a great networking, learning, and musical opportunity.
Book Em Search. Save. Succeed

Book Em is an app that is created in the best interest of the working college student. One thing noticed in the average college student is how dissatisfied they are when they have to spend $400-$700 on their textbooks. Usually these students spend all of Summer and Christmas break working vigorously just to cover the costs of their books for the semester. After the cost of numerous other things, students are left penniless heading into the semester. There has to be a way for students to get their books and benefit at the same time, and that is when the app Book Em was born. Book Em will be an app that allows students to finance the cost of their books and use a payment plan to cover the cost as they progress through the semester. Students who are fresh out of college often have a hard time building credit. Book Em will be able to help with this problem as well.

Conservation with kestrels in the high school classroom

For birds, habitat selection is determined by a variety of factors (e.g. food availability, predator density, nest site availability). Urbanization and other human influences are continuously changing local landscapes. As the landscapes continue to change, it is important to evaluate the quality of the habitat for different species. American Kestrels (Falco sparverius) are common in North America but have been declining for decades despite conversation efforts, including the introduction of secondary nesting sites (e.g. nest boxes). Studies that examine nest box occupancy patterns and reproductive success are important for determining habitat preference of kestrels and can inform managers about where to place nest boxes to ensure breeding success. Introducing conservation and citizen science projects into the high school biology classroom takes students beyond the textbook as well as introduces projects to the community. Students then gain knowledge through real world applications.

Using a Molecular Crowding Technique to Inhibit the Loss of Function from UV Light on Crystallin Proteins in the Eye

The crystallin proteins are a major component in the lens of the eye; a primary function of alpha-crystallin is to prevent denaturation and aggregation of proteins in the lens through chaperoning functions. When crystallin function is lost, cataracts can form in the eye due to the aggregation of the proteins. UV light exposure during a person's lifetime can cause a loss of chaperoning ability in crystallin proteins. This study provides evidence on the effect that UV light has on the overall chaperoning ability of alpha-crystallin. Ficoll is used as a crowding agent in the study to determine if molecular crowding can protect the crystallin from losing function. The results of the aggregation assays for chaperoning function as well as protein structure insight from fluorescence spectroscopy will be presented.
Prescription Description — An Integrative Learning Activity for Anatomy & Physiology

Anatomy & Physiology (A&P) is a material-intense course; pedagogical approaches for this class often emphasize term and concept acquisition and reinforcement. Integrative learning employs strategies intended to help students make meaningful connections both across the landscape of a particular field as well as between disciplines. Prescription Description is an assignment for A&P students designed to centrally integrate pharmacology, including marketing and sales dimensions, into study of human body structure and function. Outcomes for the activity centered on promoting understanding of the molecular-to-body system level activity of a prescription medication, while also gaining and applying holistic (e.g., chemistry, history, business) knowledge about a specific assigned drug. After completion of the exercise, students were surveyed to evaluate effectiveness of the integrative approach. Analysis indicates that integrative activities may be useful for student learning in A&P.

Separation of Sm and Co Using Water-Immiscible Deep Eutectic Solvents (DESs)

Samarium-cobalt magnets are rare earth magnets often used in engineering and consumer electronics due to their extreme magnetic strength, especially at high temperatures. The demand for these magnets is increasing as technology continues to advance, but traditional extraction of samarium is costly and produces large amounts of waste. Recently, ionic liquids have been used to separate samarium from cobalt; however, the high viscosity of these solvents contribute to difficulties during the extraction process. Water-immiscible deep eutectic solvents (DESs) are a new class of solvents that emerged from the ionic liquid field. In this study, hydrophobic DES mixtures of tetraoctylammonium bromide and carboxylic acids were synthesized. Each DES was then mixed with samarium-cobalt magnet digest. The aqueous samples before and after extraction were analyzed for cobalt and samarium content using ICP-OES. Cobalt was successfully extracted in the form of tetrachlorocobaltate(II).

The Corruptions of Right

“The Corruptions of Right” is a sampling of a larger poetry collection based on the themes of corruption found in J. R. R. Tolkien’s life and fantasy. Tolkien utilizes corruption to great effect in his fantasy world of Middle-earth, and those elements of corruption reflect the realities Tolkien saw throughout his lifetime. His lifetime covered both World Wars, the movement towards large scale industrialization, and many other occurrences. The portion of my original collection in “The Corruptions of Right” all focus on either WWI, WWII, or the outcomes of war. War brings out the most vivid illustrations of the true depravity the world can stoop to when people and actions are twisted in pursuit of a goal. As Tolkien himself was a poet, poetry is the ideal medium to convey this facet of corruption. This collection correlates to the critical portion of my capstone, “Creation and Character: Corruption’s Foothold in Tolkien’s Life and Works.”
Strategies in Simulated Repeated Play Game Theory

Game Theory is the study of how to make decisions when the outcome is dependent on not just your decision, but also the decisions of other ‘players.’ Games can be played once or many times in a row. Repeated games are common in business, biology, and many other fields, where we see sets of players repeatedly play the same game. We explored the best strategies to play these games when our opponent is similarly playing based on game-theoretic principles and wanted to know how one could take advantage of play that deviates from these principles. We designed a simulator and multiple player objects to explore these questions. Our simulations discovered the extent to which randomization is important in play as well as tested taking advantage of non-optimal play by modelling players’ choices as being dependent on nth-order serializable Markov Chains.

The Art of Balance: Influential Factors on Work-Life Balance Stress among Presbyterian Church (USA) Clergywomen

This research examines factors that impact work-life balance stress of Presbyterian Church (USA) clergywomen. The hypotheses are that introverts experience more work-life balance stress than extraverts; perceiving types experience more work-life balance stress than judging types; clergy who are satisfied with their job experience less work-life balance stress than clergy who are not satisfied; clergy who are emotionally exhausted experience more work-life balance stress than clergy who are not exhausted; and clergy whose spouse contributes more often to housework or childcare will experience less work-life balance stress than clergy with spouses who contribute less. A purposive and snowball sample of 225 PC(USA) clergywomen answered an online questionnaire. Analysis was done using t-tests, crosstabs, and multiple linear regression. It was found that higher work-life balance stress is correlated with being introverted, being dissatisfied with ministry, and being emotional exhausted.

Statistical Analysis of the 2-1-1 Service System

The 2-1-1 organization is a part of and governed by the United Way, a non-profit organization devoted to serving people in need. Essentially it is a call, web chat, or texting hotline for human services that can help direct people to agencies or programs that can allow them to improve their present situation, through a professionally trained operator. In regards to the project, it will be looking at the statistical analysis of variables that the organization has collected and made into usable data. By using statistical methods, this project will be able to show the relationships of the variables, that can help the 2-1-1 system operate and reach out to the public more efficiently. One of the main variables the organization would like to look at is the relationship between the call received with primary reason for calling, compared to the other variables. Overall, this project’s goal is to be able to find relationships, so that 2-1-1 can make decisions based upon any relationships found.
Model United Nations

In November of 2016, Westminster College United Nations Club participated in the American Model United Nations Conference (AMUN) in Chicago, Illinois. As delegates in the different committees of AMUN, students had to role play as delegates from Moldova and Yemen. This required many hours of preparation and research before the conference even started. At the end of the four day weekend, the students walked away with valuable experience in diplomatic development and courtesy, and one team from Westminster College was presented with an Outstanding Delegation Award for their hard work throughout the conference.

Influence of Emotion Present During Encoding on Semantic Memory Performance

This study investigates the influence of emotion (anger, joy, sadness, neutral) present during encoding of semantic memory when a neutral emotion is present at memory retrieval. 70 college students were randomly assigned an emotion condition (anger/joy/sadness/neutral) and instructed to write for 5 minutes on a sheet of paper about a past experience or their daily routine. Participants then were presented with a list of 40 words for one second each. After a 12-minute retention interval task they did a recognition memory task. The findings show there was no significant difference in memory performance, but participants who experienced sadness during encoding had high confidence in their responses. Future research should focus on the relationship between confidence, performance and the influence of positive and negative affect.

VITA Tax Preparation

Community service learning project providing volunteer income tax services to the elderly and economically disadvantage.

Earth’s First Martian Colony

Every year, there is an international Math Modeling Contest (MMC) that allows teams of three to choose from a select list of problems. This year, our team chose the Mars scenario. In this scenario, we had to develop an intense model that
accounted for every aspect of human life and show that our plan could sustain a colony on Mars for ten years. In creating this model, we had to focus on several qualities that we wanted present in our society, including gender equality, ethnicity equality, government, gross domestic product (GDP), and child care, to name a few. We created a computational model of the society and citizens using our goals and updated it by month. The simulation kept track of every variable such as: individual age, occupation, money, hunger, marriage status, and monthly costs to name a few. Our model was very reflective of real life to the point of even surprising us at times. We present our model and its results on the Martian Colony.

Isaiah Morgenstern
Physics
Faculty Sponsor: Dr. Robert Knop
Patterson Hall 207, 9:50-10:05 a.m.

Numerically solving the two-dimensional Schrödinger equation using GPU computing

Imagine a world where you could walk through the wall or be in multiple places at once. Such a world is only a fantasy, or is it? As we study matter at smaller spatial scales, we find a world that follows a strange set of rules: the rules of quantum mechanics. One of the core rules of quantum mechanics is the Schrödinger equation, which describes how fundamental particles move around on the smallest scales. This presentation will describe a computer code that solves the Schrödinger equation in two spatial dimensions. The code uses multiple processors available on a modern graphics card (graphics processing unit, or GPU). The code calculates how the probability density of a particle will flow through space over time. The program visualizes the two dimensional probability density with three dimensional plots that show the flow, as well as the boundaries through which it flows.

Mikayla Morrow
Biology
Faculty Sponsor: Dr. Joshua Corrette-Bennett
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.
Funding Received from the Drinko Center

Suppression of biofilm formation in Staphylococcus aureus by targeting Staphylococcal accessory regulator X expression using siHybrids

Nosocomial infections are becoming increasingly prevalent due to the ability of bacteria, such as Staphylococcus aureus, to adhere to implanted medical devices via biofilm production. Adherence is initiated by secretion of polysaccharide intercellular adhesion (PIA) molecules and is controlled by the icaADBC (ica) operon. SarX is believed to function as a positive regulator of ica. We investigated if sarX function can be suppressed using sequence specific siHybrids, and if so, whether biofilm development decreased. S. aureus was transformed with siHybrids that targeted sarX transcripts and biofilm growth was measured with crystal violet stain. Suppression was detected through standard Trizol RNA isolation methods, cDNA conversion, PCR amplification, and agarose gel electrophoresis. The treatment groups were compared to three controls: untreated S. aureus, sterile media, and E. coli. The results indicated that suppression of sarX with siHybrids led to a decrease in biofilm formation.
Westminster String Ensemble

The Westminster College chapter of ASTA will perform as a small ensemble. The string players in our group will collaborate and perform both classical works and arrangements of pop songs. This performance will allow us to share music with the rest of the campus and share what we have learned about our own instruments through our national conference and through all of our hard work this year.

Ashleigh Nealer
Music Performance
Faculty Sponsor: Dr. Nancy DeSalvo
Wallace Memorial Chapel, 2:20-2:40 p.m.

The Lark Ascending

For my URAC performance, I will perform a portion of “The Lark Ascending.” This piece was written by British composer Vaughan Williams. It was inspired by a poem of the same name, but now this piece of music is far more famous than the poem itself. It is a popular piece for violinists to play, and is considered part of the standard repertoire.

Zachary Nedley
Communication Studies
Faculty Sponsor: Dr. Colleen Merrick
McKelvey Campus Center Witherspoon, 8:30-9:30 a.m.

The Effect of Fake News and Misinformation on Mass Media

Fake news is the intentional use of misinformation and propaganda purporting to be truthful in order to mislead readers. The term “fake news” has recently gained popularity in American Politics for describing the general mistrust in mainstream media. Tabloid media outlets on the internet create and spread fake news by intentionally structuring untrue articles to resemble trusted media outlets. Tabloid news outlets have become popular due to the increasing use of social media and file sharing forums. The term fake news is often used to describe the political bias of mainstream media outlets because ethical journalism is supposed to remain objective. I found that fake news does not have a significant impact on mass media and the way people interpret current events.

Brandie Nicely
Fine Art
Faculty Sponsor: Peggy Cox
Patterson Hall, Outside Foster Art Gallery, 2:00-2:30 p.m.

Patterns and Interrelations within Nature: An Observational Study

A series of abstract charcoal drawings reflecting the complex network of inter-dependency within nature will be shown. Each piece weaves together the natural world through the use of recurring patterns.
Kaitlyn Nicholson  
Music Performance  
Faculty Sponsor: Dr. Timothy Winfield  
McKelvey Campus Center 1st floor, 2:45-3:15 p.m.

Katie Joy

Katie Nicholson is junior business major with a minor in music. She will be performing cover songs as well as originals from her upcoming album, “Collective Canvas.” Her music is bright and unique, with elements of electro-pop and rock.

Audrey Nickle  
Molecular Biology  
Faculty Sponsor: Dr. Karen Resendes  
Patterson Hall 207, 1:20-1:35 p.m.  
Funding Received from the Drisko Center

The Disruption of Nuclear Export and Protein Localization with 5-Fluorouracil

There are many mechanisms that lead to development of cancer, and the study of these mechanisms is crucial in determining which treatment methods will be most effective in different varieties of cancer. The chemotherapies 5-fluorouracil (5-FU) and camptothecin derivatives irinotecan and topotecan, are linked to the alteration of the mechanisms of nuclear transport in order to induce apoptosis. We observed that combination treatments of 5-FU with topotecan or irinotecan disrupted nuclear transport before permeabilization. The process of nuclear transport involves several karyopherin family proteins, including the exporter Crm1, which exports several tumor suppressors whose exclusion from the nucleus contributes to cancer development, such as p53. We show that 5-FU alone and in combination with topotecan or irinotecan lead to nuclear accumulation of p53. Our results reveal details of how 5-FU and camptothecin therapies alter nuclear transport and localization of cancer-related proteins.

Robert Noble  
Marketing  
Faculty Sponsor: Dr. Robert Badowski  
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.

Nightlife App

Have you ever been in a bar or nightclub that’s having a bad night and wondered where everyone is? If you have, then this app is essential for your weekend partying. The app is called Nightlife. The purpose of this app will be to give a head count of how many people are in a bar at any given time. In this app, you will also be able to see live events or specials at a bar. The app will have a simple user interface and continuous, up-to-date info. Bars will be in charge of keeping the headcount with a Bluetooth clicker that automatically updates the app for them. We are researching advertising methods, revenue models, competition, and opportunity, among other things, to get the app ready for launch.

Brooke Novotny  
Psychology  
Faculty Sponsor: Dr. Sandra K. Webster  
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.

The Effects of Post-encoding Emotional Arousal on Memory

This study examined whether post-encoding emotional arousal increases the consolidation of item memory. 18 Undergraduate Westminster College students between the ages of 18 and 23 encoded a random list of words on
a computer screen. After viewing the words, during a 30 second rest period, they rated their mood on an interval scale of 1-9 (1 being the lowest and 9 being the highest.) The subjects then viewed a 3-5-minute neutral, positive, or negative video (randomly assigned) and again rated their mood afterwards. The subjects then waited for 20 minutes before performing the memory test where they tried to remember as many words as possible from the list. Results are expected to show that post-encoding emotional arousal for positive stimulus (video) increases free recall but not for neutral or negative stimulus.

Tiffany Nuzzo  
Marketing  
Faculty Sponsor: Dr. Robert Badowski  
McKelvey Campus Center Witherspoon, 12:30-1:30 p.m.

Eliminate Your Financial Stress Forever with $aveMe

How many times in your university or college have you overheard someone say, “Sorry, I would, but I’m broke”? As if the worry of debt that lingers in the future is not enough for those attending college, it is also difficult to stay afloat with money while in school. The app $aveMe will solve this problem forever! The mission of $aveMe is to provide our customers with a way in which the college student can budget in order to manage paying all of their bills on time, having money for groceries and gas, and even having some money left over in order to do whatever he or she may want to do. The user simply needs to download $aveMe and enter his or her pay per week and monthly bills. $aveMe will provide the user with how much money to put away per week toward each bill and how much money to set aside for a savings account. By using our app, our customers are taught how to budget one’s self at the age when establishing a good financial background matters the most.

Madison Ordonez  
Medicine  
Faculty Sponsor: Dr. Joel Postema  
Patterson Hall 205, 10:15-10:30 a.m.  
Funding Received from the Drinko Center

Pharmaceutical Field in Dominican Republic

In order to research the pharmaceutical field in the Dominican Republic and to investigate where locals obtain their medication, research will be done in Sabaneta de Yasica, Dominican Republic. Prior to the trip, I will be looking into where locals receive their medication in the surrounding area. The goal is to comprehensively compare these companies to pharmaceutical companies in the United States. In researching both companies, the comparison of drug composition, safety precautions and cost of medication can be made. I will be utilizing my Spanish speaking skills to communicate with the patients in the medical clinics about the medication they take regularly. After communicating with patients, I will create a database where patient age, gender and regularly-taken medications are recorded. This research will prove beneficial to our mission team in determining the appropriate medications to distribute each year.
The PMEA Experience

PCMEA members and music students discuss the experiences they had at the Pennsylvania Music Educators Association All-State Conference April 19th - 21st, in Erie, PA. Students attended a wide variety of sessions in various areas of music education led by leading teachers and professors from all across Pennsylvania. They also watched performances by several middle school, high school, collegiate, and professional ensembles. For this presentation, students share the highlights of what they have learned from the conference, and how they will implement these ideas in their future careers as music educators.

Effectiveness of Multimodal Notifications for Disaster, Catastrophe, and Home Disaster Events

The purpose of this study is to determine whether or not bimodal notifications will elicit faster response times, more accurate identifications, and better subjective responses compared to unimodal notifications. It is important to consider the mode in which a user is notified to ensure that it grabs their attention and informs them of the situation. In order to distinguish the most effective notification modality, experiments were conducted where the participants completed a mundane task, were interrupted by the notification, and were asked to respond accordingly. The experiments consisted of either text (the control group), visual, auditory, or the combination of auditory and visual cues in order to compare the differences between modalities. The main experiment was followed by a subjective and recall questionnaire. This study will analyze the response times, subjective ratings, and accuracy of recall in order to determine the most effective mode.

Heavy metal analysis of manure and feed samples from local farmland in northwestern Pennsylvania

Environmental awareness of heavy metal contamination in soil has increased in the last few decades. Some heavy metals may be present in nutrient-supplemented feed such as corn silage, hay, and grain, which may be detected in animal excretions, such as manure. The aim of our study was to determine the presence and concentration of selected heavy metal content, copper (Cu), zinc (Zn), nickel (Ni), cadmium (Cd), and lead (Pb), in cattle, horse, and pig manure among six northwestern Pennsylvania farms. We hypothesized that Cu and Zn, in particular, may accumulate at higher concentrations. Acid digestion and inductively coupled plasma optical emission spectrometry (ICP-OES) were used to analyze the samples collected. Our data showed that Zn and Cu metal concentrations were highest among livestock feed samples but not their manure. Our protocol could be used in future studies to analyze biological samples near other areas impacted by high pollution levels, such as gas extraction sites.
Sarah Pace  
Biology  
Faculty Sponsor: Dr. John Robertson  
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.  
Funding Received from the Drinko Center

**Quantifying lens crystallin in various species of teleost fish**

Crystallins are the major proteins of the vertebrate eye lens. α-, β-, and γ-crystallins are three variations in crystallin type that promote proper structure and function within the lens. The goal of this study was to examine the crystallin profiles among channel catfish, largemouth bass, bluegill, Nile tilapia, and muskellunge. It was hypothesized that there would be differences in crystallin profiles among phylogenetically unrelated species. Electrophoretic gels were run, and intensities of the protein bands for α-, β-, and γ-crystallins at their respective molecular weights were analyzed using the ChemiDoc imager. Differences in crystallin profiles suggest that phylogeny does have an effect on protein present within the piscine lens. From these findings, the cell and molecular and comparative biology communities can continue integrating ideas and examining organisms evolutionarily in order to obtain a better understanding of where species lie on the phylogenetic tree.

Sarah Pace  
Spanish  
Co-author(s): Shelby Seyler  
Faculty Sponsor: Dr. Joel Postema  
Patterson Hall 207, 12:55-1:10 p.m.  
Funding Received from the Drinko Center

**Health and Science Education of Children in the Sabaneta de Yásica area of the Dominican Republic**

Shelby and I would like to expand our understanding of the education system in the Dominican Republic. In particular, we would like to study health and science related courses in the Sabaneta de Yásica area for children ages 6-18. When we visited the Dominican Republic last spring, we noticed drawings of DNA and other cellular structures on the chalkboard, causing us to question what the students learn and how in depth. We will be interviewing (in Spanish) children we encounter at the school in which we stay. Our questions will aim to cover a range of topics that help clarify what children are taught in their health and science subjects in the Dominican Republic. For example, we may ask students about the flood that recently affected the area, causing a shortage of clean water. Overall, we will be looking at the education of younger generations in relation to health and sciences in the Dominican Republic. The information we obtain will be presented at URAC in the spring.

Sarah Pace  
Biology  
Faculty Sponsor: Dr. John Robertson  
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.  
Funding Received from the Drinko Center

**Determinants of water quality of natural springs in western Pennsylvania and eastern Ohio**

In our region, spring water is a valuable source of drinking water. If groundwater becomes contaminated, the health of the people who drink from the spring could be affected. Thirteen springs were tested for a series of physical, chemical, and biological parameters to determine if those parameters exceeded the EPA’s Maximum Contaminant Level (MCL). We used ICP-OES to test for the presence and concentration of several metals in our samples. Colorimetric analyses were conducted to analyze the concentration of total phosphorus and nitrates. All samples were quantified for coliform. We then used ArcGIS to quantify nearby land use and looked for correlations with water quality. All springs tested failed to meet EPA standards for coliform, two springs failed for iron, and three springs failed for manganese.
Phosphorous levels for all springs were far below the EPA's MCL, and no springs failed the nitrates analysis. We also found multiple correlations with our various types of land use.

Margaret Panagiotou
Psychology
Faculty Sponsor: Dr. Mandy Medvin
Patterson Hall 205, 10:40-10:55 a.m.

Retrospective Views on Worry about News Violence and Effective Coping Strategies

This retrospective study investigated the influence of coping strategies on students’ worry regarding negative news television topics. It was predicted that students who used problem-focused coping would have a lower level of worry than those who used emotion-focused or avoidant coping. Fifty-three college students between the ages 18-22 years old were asked to think back to when he or she was a middle schooler and complete three surveys. Participants were instructed to imagine that a news report interrupted their television program and to indicate their level of worry when viewing specific violent news topics. They then completed surveys evaluating use of coping measures in response to their level of worry, current level of anxiety, and television habits as a middle schooler. The main results were not supported. This study contributed to the lack of research in the effects of news media violence.

Natalie Paoletta
Marketing
Faculty Sponsor: Dr. Robert Badowski
McKelvey Campus Center Witherspoon, 12:30-1:30 p.m.

Write from Anywhere with Anyone. Introducing SongShare

Songwriter’s portfolios are full of original songs along with a collection of collaborations with other writers. However, with writers that do not live in popular music cities, it is difficult to create these collaborations. Partnered with the Nashville Songwriting Association International (NSAI), my app is designed to allow writers to write their lyrical ideas, and to record voice or instrumental memos. Along with being able to keep their creations in one place, writers will also be able to connect with other writers and share their ideas on their profiles, while working on the same documents or recordings. The app is free to download but will have a $4.99 membership fee per month, with their first month free. Being the only writing and social app like this on the market, my app has a competitive advantage against other music apps. The app will be released during the CMA Music Festival this June to celebrate music and the artists that create it.

Anne Papa
Molecular Biology
Faculty Sponsor: Dr. Joshua Corrette-Bennett
McKelvey Campus Center Witherspoon, 8:30-9:30 a.m.

Gene Expression Analysis of Msx-2 and Cox3 During Limb Regeneration in Ambystoma mexicanum

Ambystoma mexicanum (axolotl) are distinct among vertebrates in their ability to regenerate limbs, tail, jaw and spinal cord. The process of limb regeneration in axolotl is an ongoing source of extensive study to identify the cell and molecular interactions and mechanisms in response to loss of a limb. Total RNA was isolated from limb and tail tissue of Ambystoma mexicanum (axolotl) for the purpose of gene expression analysis during specific phases of limb and tail regeneration. Cox3 gene, known to be ubiquitously expressed in axolotl served as a positive control. An experimental gene, Msx-2, known to be up-regulated in later stages of regeneration was targeted for analysis of expression in adult
tissue and newly regenerated tissue. The process of quantitative reverse transcriptase polymerase chain reaction (RT-qPCR) was utilized for amplification and characterization of gene expression of target genes, Msx-2 and Cox3.

Angelica Petrisko
Public Relations
Faculty Sponsor: Dr. Brittany Rowe-Cernevicius
McKelvy Campus Center Witherspoon, 9:45-10:45 a.m.

Image Management Comparison and CSR Documents and The Mylan Epi-Pen Scandal

This case study followed Mylan Corporation from June of 2016 to February of 2017 during the nationwide Epi-Pen Scandal. This study is a comparison of Mylan’s company’s Corporate Social Responsibility documents and the actions performed during and after the scandal. The findings show that there are major inconsistencies between the company’s CSR plan and their actions performed during the Epi-Pen scandal.

Jennifer Piascik
Public Relations
Faculty Sponsor: Dr. Brittany Rowe-Cernevicius
McKelvy Campus Center Witherspoon, 8:30-9:30 a.m.

The Effect of Breed Perception on Pit Bull Adoptions

This study looks at 18-25 year olds and their interest in adopting a dog; specifically, the study looks at the perceptions that 18-25 year olds have about pit bulls. The results from the study were used to assess how 18-25 year olds feel about the breed and what research methods they were employing when they were looking to adopt a dog, in regards to breed, temperament, size and other characteristics. The findings of this research show how animal organizations such as the American Pit Bull Foundation can use targeted message strategies to help increase interest and adoptions for a breed that may not have the best reputation.

Cameron Pozsgai
Marketing
Faculty Sponsor: Dr. Robert Badowski
McKelvy Campus Center Witherspoon, 9:45-10:45 a.m.

If you ruined your favorite pair of shoes, then you need “KicksRepair”

“KicksRepair” is a simple online application where you can send your old, favorite pair of sneakers to our headquarters, where our team of professionals will clean, stitch, color, and repair your shoes until they look exactly how you want. We can even take the creasing out of your shoe to put the edge and crisp back into your shoe. You will only get them back when they look good as new again. In this app, you can also buy, sell, and trade any shoes in decent condition on our trade and sales boards with anyone in the world. This app is ideal for big-time shoe collectors, for the average person who enjoys having clean shoes, and for the person who has their favorite shoes that they wish looked the same as when he or she bought them. “KicksRepair” is for you!
Frosty Car Windows: A Microhistory of the Effects of Cold War Propaganda on the Depiction of Young American Women, Specifically LuAnne Henderson

Jack Kerouac’s *On the Road* encapsulated not only the emotional depletion and angst of the post-World War II Beat Generation but also the lives of young adults across the United States in its representation of freedom. Yet, despite the Beats’ mileage and speed, they could not escape the bitterness of the Cold War. It frosted up their windows and altered their perceptions. This was particularly true of Beat depictions of LuAnne Henderson, teenage bride of literary legend Jack Kerouac’s close friend Neal Cassady. Portrayals of her character were decidedly influenced by mid-20th century American gender norms for women. Sexuality, marriage, and working and home lives were largely responsive to Cold War political culture as fierce patriotism encouraged a strong urge for compliance and conformity. Henderson’s role within the Beat community also demonstrated that there was a certain yearning for a “respectable” life among Beat men.

D3 All Access

D3 All Access is an app that will provide Division III sporting events to users across the United States. Our app will provide livestreaming, scores and highlights. D3 All Access will cover every sport at the Division III level. The app will be no fee to our users, because we are the only app in this market. The plan and future outlook for our app is to team up with ESPN and have the ability to grow as big as their Scorecenter app.

Experiencing Music from The Stage

All of us attend concerts. We watch musicians play instruments or sing and enjoy the sonic atmosphere created by them. We wish to provide a more in-depth understanding of how and why the music is made. What decisions do the musicians and conductor make related to the printed language (musical notation) and how it is interpreted? For this presentation, the Wind Ensemble and its director request for all in attendance to actually sit in with or behind the musicians on the stage. Examine the printed language (music). What does it tell the musicians and conductor? What is “Loud”? What is “Soft”? How and why do the musicians articulate; how do they shape phrases? What awareness must the musicians and their conductor have related to the sounds that surround them?
Vanessa Restifo  
Public Relations  
Faculty Sponsor: Dr. Brittany Rowe-Cernevicius  
McKelvey Campus Center Witherspoon, 12:30-1:30 p.m.

**Coffee and Conversation: The Grande Fail of Starbucks’s “Race Together” Campaign**

Race relations are a hot topic in today’s political climate, and one leading coffee chain saw a unique opportunity for social change through corporate sales. In an attempt to forge conversation about the issue plaguing the nation, Starbucks launched the “Race Together” campaign in March of 2015. Centered around the simple idea of writing the words “race together” on the cups of willing customers, the campaign aimed to give buyers a chance to demonstrate their support of racial equality through meaningful conversations about the topic. In this study, I will explore the reasons this campaign failed in achieving its goals through the analysis of the brand’s strategies and tactics as well as consumer perception. I will also discuss the impact of the campaign on the brand in addition to the social implications on society as a whole in this socially turbulent era we are experiencing today.

Abbigail Rinard  
Psychology  
Faculty Sponsor: Dr. Mandy Medvin  
McKelvey Campus Center Witherspoon, 8:30-9:30 a.m.  
*Funding Received from the Drinko Center*

**Influence of Stress Induced Cortisol, Gender and Emotional Arousal on Memory Consolidation**

This study examined the effects of stress, gender and emotional arousal on memory consolidation. Thirty-eight undergraduate students were randomly assigned to a stress versus no stress condition and pre-post cortisol levels were assessed. Afterwards, participants viewed emotionally pleasant, unpleasant and neutral images and returned one week later to complete three memory tasks for the pictures: free recall, cued recall and recognition. It was hypothesized that cortisol-induced stress would enhance memory for emotional information, specifically in men more than women. Findings did not support the hypothesis. Instead, women remembered more positive images than men. Future research should explore gender differences and possible hormonal effects and how it influences stress. Challenges of conducting research in this area are discussed.

Mariah Roberts  
Mathematics  
Co-authors: Ian Miller, Jocilyn Rush  
Faculty Sponsor: Dr. Carolyn Cuff  
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.

**United We Stand: Assistance to First-Time 2-1-1 Callers**

United Way, a non-government organization that runs the PA 2-1-1 program which mirrors the 911 response line, aids those who require assistance. The caller presents the dispatcher with their need, after which the caller is then referred to someone who can help them properly handle the emergency pertaining to social services. United Way teams up with People’s Gas, UPMC, and other local corporations to refer people with social needs. The southwest region of PA 2-1-1 refers people from eleven counties in southwestern Pennsylvania. The 2-1-1 program is run by United Way Worldwide, which collects information on callers to reference the data in a meaningful way. The United Way strives to improve the quality of their referral service. This study delves into the needs of first-time callers, allowing us to tailor to the needs of individuals. This work explores relationships between first-time callers and repeat callers to southwestern PA 2-1-1.
LibEz; Changing the Way We Study

Lib-Ez is a free, interactive and social app, available on the Apple Store and Google Play marketplaces, geared toward students on college campuses. With finals week, midterms, tests and even quizzes, students are always cramming and studying anywhere and everywhere, Lib-Ez is there to ease some of their stress. Ever walked all the way to the library on campus in the cold only to find out there’s nowhere to study? Lib-Ez, using users’ location settings, will inform you whether the library is busy or not. Lib-Ez will also have a function where users can create study groups for classes with upcoming tests, exams, etc., utilizing and promoting the use of study groups. Users will create profiles and simply select the class for which they will be studying or doing homework, and Lib-Ez can create an instant and public study group. Even after classes are over, Lib-Ez’s Book-Ez feature will allow users to buy and sell books, all while keeping the average college students’ low income in mind.

2-1-1 How can we help?

Pennsylvania 2-1-1 Southwest is a non-profit program that provides information and assistance to those needing social service agency support. Pennsylvania 2-1-1 Southwest helps those in the counties of Allegheny, Armstrong, Beaver, Butler, Fayette, Greene, Indiana, Lawrence, Mercer, Washington, and Westmoreland. To reach 2-1-1, individuals can either call, text, or chat with a resource navigator on their online website. After connecting, resource navigators will discuss the individual’s needs, provide two referrals to a community resource capable of assisting them, and ask to follow up to ensure their need was taken care of. The administrators of 2-1-1 are interested in learning how individuals are hearing about 2-1-1 and the needs of those from the Southwest counties of Pennsylvania. We will be analyzing the community resources 2-1-1 works with, the needs each resource is capable of meeting, what type of resources are in each county, and the specific services each county may need.

Understanding the Binding Patterns of Alpha-Synuclein to Membranes

α-synuclein (αS) is a neuronal protein that can aggregate into Lewy Bodies in the pathology of Parkinson’s Disease. αS is known to interact with the lipid component of the cell membrane, and the strength of the interaction has been shown in previous studies to be dependent upon the curvature and charge of the membrane. The aim of this study was to gain a better understanding of the structure and dynamics of αS when binding to membranes of different size and lipid composition. Site-directed mutagenesis was used to replace a native amino acid with a cysteine residue, which can interact with a spin label. This technique allows interactions between αS and the membrane to be analyzed using electron spin resonance (ESR) in a very site-specific manner on the level of the individual amino acid. In this study, mutant DNA was transformed into bacterial cells and new mutants were generated using PCR, effectively setting the groundwork for future Westminster students to perform ESR studies.
The State of Florida v. George Zimmerman Trial: Tactics Used to Manage Zimmerman’s Reputation

In 2012, the trial of The State of Florida v. George Zimmerman gained attention nationwide due to racial issues brought forth by outraged citizens during the investigation. Protests began around the country, arguing why Zimmerman was or was not guilty. In efforts to preserve Zimmerman's reputation, his attorney, Mark M. O'Mara, created a social media campaign. The campaign was designed to defend Zimmerman as well as present facts about the trial directly to the public. This case study analyzes and discusses the strategies and tactics used throughout the trial, with close attention paid to the public’s response of Zimmerman’s presence on social media. The Zimmerman trial is a model for integrating social media as a public relations tool in the field of law and the use of social media as a reputation management tool.

The Kosmic Traveler and The Jazz Poet: Cultural Crossings of Walt Whitman and Langston Hughes

My capstone focused on Walt Whitman’s “Song of Myself” and various Langston Hughes poems. I analyzed inclusive American poetry during the darkest times of America hoping to shine light on the good in humanity. One question never left my head while reading about slavery, lynching, and moments of misogyny in the 19th and 20th centuries. That lingering question was, “How did those poets write about the best of America when their surrounding worlds were cruel?” Answering this question, I decided that we must remind ourselves of America’s unequal past causing deep-rooted hatred in order to transcend into a peaceful world. Their literature is an excellent place to begin the search for finding the best in America and ourselves because they defy hatred and advocate for all of humanity. Whitman’s “Song of Myself” directly influences Hughes's poetry, and both poets leave their literary legacy to define 21st century America during a time of lingering animosity.

Francisco de Goya and las pinturas negras

Francisco de Goya was an influential Spanish painter who lived from 1746 to 1828. Goya's early career occurred during the Enlightenment, and he continued working into the Romantic Era. His later career included a collection of works known as the Black Paintings. This study will examine how the Spanish War of Independence and multiple illnesses greatly affected the tone and quality of his work, in particular, the Black Paintings. For example, in the painting “Saturn Devouring His Son,” we see a dark scene in which Saturn is holding a bloody, headless child with the only source of color coming from the blood dripping down the child’s lifeless body. This represents Saturn as God, one who does not care about his children, breaking from traditional ideologies of religion and patriarchy. We find that this kind of despair can be applied to the entire collection of the Black Paintings, which represents a significant philosophical change in art.
Dominic Schrecengost  
Marketing  
Faculty Sponsor: Dr. Robert Badowski  
McKelvey Campus Center Witherspoon, 8:30-9:30 a.m.

Diversity Restaurant

I am making an app called Diversity Restaurant that will suggest restaurants for people looking to experience different cuisine. When the app is downloaded, it will start by having the user make a profile, and this will include a survey to find details on your dining preferences. After this is complete, the app will suggest a restaurant, and then you can review your experiences to continue updating your profile. For this app, I had to research different aspects of restaurants that would be important in determining suggestions. I also had to research app design, ways to gain revenue from this app, and how to market the app so it can be successful once it is created.

Becca Schumann  
Political Science  
Faculty Sponsor: Dr. Shannon Smithey  
McKelvey Campus Center Witherspoon, 8:30-9:30 a.m.

The Post-Colonial Relationships of India, Australia, and Great Britain Depicted in Political Film

This study has used political film media to examine post-colonial relationships between Great Britain, Australia, and India. By looking at four films from these three countries, the research hoped to see that Great Britain was more apologetic and wishing to adapt their cultures with their post-colonies of Australia and Great Britain. Meanwhile, it was expected that India and Australia would focus more on the negative qualities of the past colonial ties. Upon inspecting the plots, characters, and interactions of the films, however, the research found that though Great Britain was most likely to be apologetic towards the post-colonies and likely to adapt their culture, India was also likely to show a promotion of a blending of cultures. Australia was the most likely to point out the negative post-colonial relationship. All films concluded that the best method for mending relationships was tolerance of other cultures.

Katherine Shaw  
Psychology  
Faculty Sponsor: Sandra K. Webster  
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.

Implicit Attitudes of Physical Disabilities Compared to Implicit Attitudes of Mental Illness

Stigma is highly perceived, and physically and mentally disabled individuals feel stigmatized and discriminated against. This study investigates people’s implicit attitudes towards individuals with physical and mental disabilities. This will allow for a better understanding of the perceived stigma and discrimination felt by the disabled community. Participants of this study were 17 undergraduate students. Implicit attitudes of the participants were measure using an MIAT (Multiple Implicit Association Task). It was hypothesized that individuals would have more negative implicit beliefs towards mentally disabled individuals compared to physically disabled individuals. Results from a repeated measures analysis failed to accept this hypothesis. There was a significant interaction between valence (pleasant or unpleasant) and presence of illness. However, participants had equally negative implicit attitudes towards individuals with physical disabilities and those with mental illness.
Merge Left, and Buy Right

In today’s market of car-buying applications, purchasing a car can be a tedious task. However, with Vroomer, purchasing a vehicle became a whole lot easier and entertaining. Vroomer is setting out to make the process of buying a vehicle a lot more appealing rather than a chore. With Vroomer’s swipe to buy process, customers will have complete control of what kind of vehicles they view and interact with. Vroomer will be an area where buyers and sellers come together, negotiate, sell and buy, but most importantly interact in a relaxed environment. Remember always merge left, and buy right.

A Comprehensive Security Assessment of the Westminster College Unix Lab

In this project, I looked into and tested various cyber security aspects of the Westminster College Unix lab. Utilizing the Kali Linux operating system and the variety of tools provided by it, I will present the results of testing features and services of the lab to ensure user privacy and data integrity. Examples of these services include, but are not limited to, LDAP, PostgreSQL, VNC, and NFS. This is type of testing is critical to both universities and business organizations alike, because without it, major vulnerabilities could go unnoticed for extended periods of time, and the user’s private information may be affected. I will present on many techniques used in this project, including various network scans using NMAP, looking for commonly found vulnerabilities using the Metasploit Framework, and searching for security flaws specific to the lab’s configuration, such as attempting to listen in on VNC sessions to obtain private information.

Tiny Little Bots

This presentation will cover our solution from the 2016 Mathematical Modeling Contest. We placed as honorable mention for the following problem. Space cooperations such as NASA and other private organizations from around the world are working to solve the problem of space junk. This junk is a relative issue because the old broken debris darting around Earth is causing problems for the new materials that are being sent up into outer space. We devised a model that involved sending clusters of drones into space to track and destroy the small debris. Our model described effectiveness and potential cost. This model includes both a graphical and numerical representation of the drones. We then tested our model by way of Sensitivity Analysis. We analyzed how our assumptions could affect the model in terms of effectiveness and cost. We also analyzed external factors would affect these same areas.
Megan Simpson  
Public Relations  
Faculty Sponsor: Dr. Brittany Rowe-Cernevicius  
McKelvey Campus Center Witherspoon, 12:30-1:30 p.m.

**Actions speak louder: REI’s corporate social responsibility and brand authenticity through #OptOutside campaign**

REI’s 2015 #OptOutside campaign transformed what seemed like a whimsically unrealistic idea of CEO Jerry Stritzke into a revolutionary campaign founded upon brand authenticity and corporate social responsibility. In response to America’s increasingly intrusive consumerism on Black Friday, REI decided to close its doors and black out its website on Black Friday in order to actively demonstrate what the REI brand is. The company, instead, challenged its members, employees and loyal customers to spend the day outside with friends and family by creating a movement out of the idea by shutting down all 143 stores and paying over 12,000 employees to take the day off. This case study evaluates the success of the #OptOutside campaign and the implications of the importance of a company’s social responsibility through assessing REI’s ability to live out its mission statement.

Brittany Slupe  
Chemistry  
Faculty Sponsor: Dr. Helen Boylan  
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.  
*Funding Received from the Drinko Center*

**Analysis of Manganese Oxides Recovered from Abandoned Mine Drainage Passive Treatment Sites**

Western Pennsylvania has been living with the after-effects of the coal mining industry for hundreds of years which leaves abandoned mine drainage to contaminate surrounding streams. The Slippery Rock Watershed coalition has been treating abandoned mine drainage for over twenty years using passive treatment systems. During the process of treating the streams, however, there are metal precipitates that are left as a waste sludge. Included in the sludge is manganese, which can be used in various commercial processes. We have tested the properties of manganese recovered from these passive treatment sites and compared them to commercially available manganese. Results suggest the recovered manganese exhibit catalytic abilities, much like commercial manganese. SEM-EDX was used to analyze the surface and chemical composition of the recovered manganese and provided information to support the results seen in the catalytic testing.

Elizabeth Smith  
Marketing  
Faculty Sponsor: Dr. Robert Badowski  
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.

**“How Do I Look?” App**

The struggle of knowing if an outfit matches or is appropriate for an occasion is over with the new app called “How do I look?” Here’s how it works: the user tells the app what kind of occasion they are going to, industry they work for, gender, age, geographical location, and take a selfie of their outfit to see how they look. The app will rate the outfit based on appropriateness of occasion, age, and industry, appropriateness based on the weather of the user’s location, and tell them how well their outfit matches. The rates will be on a percentage scale, 100% meaning the outfit is compatible with the occasion, is appropriate, and matches. If the user receives a lower score, the app will offer suggestions on how to improve their outfit, giving them a 100% before they walk out of the door. To make this app work, algorithms will have to be programmed onto the app to know what colors match and what is appropriate for certain occasions.
Enactus Employment Workshop

The Employment Workshop gave six presentations to local high school students to help them prepare for their future. We reached over 300 hundred students. The presentation covered information of how to build a resume, how to prepare for an internship, and how to apply to college. We presented to juniors and sophomores. At the beginning of the presentation, we asked students to rate their knowledge in these areas, and then they were asked again after the presentation. This helped us see how productive the presentation was. Members of the Enactus team are traveling to Dallas, TX to present our work this year.

Self directed anger and other directed anger: Its effects on the use of stereotypes

This study explores the differences between self-directed anger and other-directed anger in relation to individuals using stereotypes to make judgments. Implicit and explicit measurements were used individually to look at the differences in using stereotypes when influenced by experiencing self-anger versus other-anger. It was predicted that individuals who experience anger directed at others would be more likely to use stereotypes to make judgments than individuals who experience anger directed at the self and individuals who were in a neutral mood. Individuals who experienced anger directed at the self were predicted to use more stereotypes to make judgments than individuals who were in a neutral mood. An Implicit Association Test was used with stereotypical African American and Caucasian names as well as positive and negative valence words. The modern racism scale (Simeoni, 2005) consisted of questions based on what would be deemed prejudice in today’s society.

Modeling the impact of environmental and biological factors on the spread of infectious disease

The modeling of infectious disease has become increasingly prevalent over the past decade. Although there are many ways in which to execute epidemic models, the intent is to glean information about pathogen virulence and host susceptibility. Using various disease parameters, models can track the spread of pathogenic species between infected hosts or directly from primary contact. Mathematical models present distinct predictive capabilities that could be exploited in the future. Through the use of stochastic models, this project seeks to analyze how minor environmental or biological factors can contribute to the spread of bacterial or viral infections.
Christen Snyder
Psychology
Faculty Sponsor: Dr. Sandra K. Webster
McKelvey Campus Center Witherspoon, 12:30-1:30 p.m.

The Effects of Pitch Contour on Perception of Emotion

This study focuses on the effect of pitch contour on a participant's perception of six common emotions: happiness, joy, sadness, anger, and fear. The participants in this study were 20 undergraduate student volunteers at Westminster College. Each participant was asked to listen to fourteen musical excerpts, seven ascending and seven descending, each with a specific average pitch. Immediately following every excerpt, participants were presented with a six-point Likert scale and asked to rate the intensity of each emotion expressed in the music. It is hypothesized that ascending melodies will show a greater rating in positive emotions such as happiness and joy while descending melodies will show a greater rating of negative emotions such as sadness and anger. Seeing as music is made of many components, it is important to consider each when evaluating whether or not music affects general mood. Future studies should look at other components and how they affect a person's perception of emotion.

Hayley Thewes
Criminal Justice Studies
Faculty Sponsor: Dr. Jamie Chapman and Dr. Kristenne Robison
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.
Funding Received from the Drinko Center

Defending the Guilty and Innocent: Daily Stressors of Defense Attorneys

There is a gap in the literature when trying to identify the daily stressors of being a defense attorney. Few, if any, qualitative research studies exist that focus on how defense attorneys experience and process their job-related stressors. This qualitative research study will investigate the research questions: what aspects of defense attorney work shapes stress, and how do defense attorneys experience and process the stressors related to defending clients that are guilty?

Anne Tillie
Political Science
Faculty Sponsor: Dr. Shannon Smithey
Patterson Hall 108, 12:30-12:45 p.m.
Funding Received from the Drinko Center

Using Regime Type and Economic Status as Predictors for Government Response to NGOs

Nongovernment Organizations (NGOs) are one of the largest facilitators of civil society and democracy. However, government reception of NGOs is varied across government type and GDP per Capita. This paper proposes a two-by-two typology based on regime type and economic status to explain government reception of NGOs. Specifically, I analyze one country from each category to identify response. Countries include South Korea, Russia, Ghana, and Cambodia. Results suggest that democracies are generally receptive of NGOs, however autocracies have a more mixed response. Richer autocracies may reject NGOs, but poor autocracies often cannot afford to dismiss NGOs.
Green Synthesis of Coumarin-3-Carboxylic Acids and Complexation with Europium(III)

Green synthesis is becoming increasingly popular in industry and research because it removes harsh organic solvents or can increase energy efficiency of reactions. This project will utilize green techniques and investigate new complexes with coumarin-3-carboxylic acid (CCAs) and lanthanide metals. There is a lack of knowledge on complexes of CCAs with europium(III) specifically. There is available data on the other luminescent and emission properties but not on the phosphorescent values of CCA based-europium(III) complexes. The information that has been determined, such as the crystalline structures and characterization, will be used to fill in the lack of knowledge on the Eu(III)-CCA complexes and their phosphorescent properties.

“The Humanity in Holmes”: A Character Study on the Personality and Relationships of Sherlock Holmes in Literature and Film

This project analyzes the personality of Sherlock Holmes, as originally written by Sir Arthur Conan Doyle, in the original canon, and his relationships to John Watson, Irene Adler, and James Moriarty. His personality and relationships are then compared to those in different television and film adaptations, as portrayed by Basil Rathbone, Jeremy Brett, Robert Downey, Jr., and Benedict Cumberbatch. While each adaptation contains inherent differences, the characters and their relationships remain faithful to the original, each in its own way. This project also contains a stage play that makes use of original characters that follow the various archetypes of the Holmes characters.

Flame Fractals

Flame fractals are sets which can be generated by iterated function systems and can be generated in many ways. We are interested in seeing if a flame fractal can be onto an entire two-dimensional shape when the fractal is generated by three functions. This will be done by investigating the function parameters (the theta values and translations) that should be used to fill up the most space in the plane and even see if the entire space can be filled. Conversely, we are also interested in seeing which scaling factors produce an image with an area of zero. These concepts will then be used to create fractals from music. Scaling factors, rotations, and translations will be assigned to the frequency and amplitude of a song to create beautiful images.
Incompetence Overpowers Intelligence?
The Cross Examination of Hermann Goering

Following WWII and the fall of Nazi Germany, the world prepares to prosecute war criminals. As the Allies prepared for the trials, they struggled to set up a form of trial that would appease all of the parties involved. Eventually, President Truman of the United States selected Supreme Court Justice Robert H. Jackson as Chief Prosecutor for the International Military Tribunal in Nuremberg, who did not have a college degree even though he served as an attorney in Washington, D.C. for 20 years. Jackson, who later serves for the decision for Brown V, Board of Education, delivers an “astonishing” opening statement. However, statistics from the trial transcripts will display the image that Jackson’s performance is not this well executed throughout the trial as former Third Reich Leader Hermann Goering unravels his agreements in the courtroom for the world to see. A flustered Jackson demands restrictions for Goering responses as he dances around an abundance of questions.

Look Deeper into Your Beer with BeerGoggles

BeerGoggles will give the restaurant and bar business the ability to maximize their efficiency as well as give the consumer an inside look on their favorite features. This app will give restaurants and bars the ability to measure and track the amount, temperature, alcohol volume, etc., for every keg they have on their draught system directly on their smartphones or tablet. This will give the bar a head start on when to change their keg so they have no lag time between beers. This gives the consumer the behind-the-scenes look at their favorite beers as well. Although they will not be notified when they need to change it, they will not only have the ability to see how many more pours of that beer is left, but also will be able to order directly through the app without walking up to the bar or even physically stepping into the building. This app will revolutionize the way restaurants and bars are run and how customer service is viewed.

The Influences of the Catholic Church on Education in Franco era Spain

In Spain, in 1936, General Francisco Franco started a military coup to take control of the government. This was the beginning of one of the most infamous times in Spanish history because it would be the start of a civil war that would last three years until 1939. After the war, Francisco Franco was declared leader of the country, and he would become a dictator until his death in 1975. During this time, Franco would be influenced by the large presence of the Catholic Church in Spain. The current study looks into the influences that the Catholic Church had on education during the Franco era such as their stance on evolution and how that should or should not be taught.
Effects of Background Music on Recognition of Words

The purpose of this study was to test the effects of music as a distraction on a word memory task. It was hypothesized that lyrical music would have more of a negative effect on word recognition than non-lyrical music. There were three musical conditions (no music, non-lyrical music, and lyrical music) that each of the 20 undergraduate students were randomly assigned. Of those participants, there were 10 men and 10 women who took the word recognition test adapted from Chew Yu, Chua, and Gan (2016). The results of the study were analyzed using a one-way analysis of variance, which did not show a significant main effect of music on word recognition. Previous studies have shown that music inhibits individual’s ability to focus on word recognition tasks. Future research should aim to understand the variability amongst music as a distractor.

4 Square Delivery

What if you had a delivery service that could deliver food with just a couple of clicks? With the 4 Square Delivery app, you can order from any of your favorite restaurants and have it delivered to your door. If you are without a car or just do not feel like traveling to the restaurant, 4 Square Delivery is the app for you. The app supports all your favorite restaurants and fast food chains at your fingertips. It is often difficult trying to find rides to restaurants or fast food places whenever you are craving a certain burger. With 4 Square Delivery, you can get “Your food, your way” any time of day.

Quantifying Bacteria Attachment Using Microscopy and ImageJ Analysis

Biofilms are prevalent in multiple aspects of life, impacting a variety of industries both positively and negatively. In the medical field specifically, biofilms are problematic. One of the first stages of biofilm development is adhesion. Most biofilm prevention research focuses on this first stage by investigating the properties and effects of antimicrobial coatings. In this work, adhesion experiments onto a glass microscope slide using Pseudomonas aeruginosa were conducted. A hydrophobic BMA-EDMA SLIPS polymer was synthesized to investigate its effects on bacteria attachment. However, it is often difficult to quantify attached bacteria experiment results. Therefore, this research not only aims to analyze the effects of an antimicrobial coating, but also investigates the use of fluorescence microscopy and ImageJ software as a quantification technique to analyze adhesion results over time.
making was measured using the judgmental bias task which determined whether fear caused participants to become hyper-vigilant or develop avoidance strategies, which are type one methods of thinking, or have no effect. This was done using a short questionnaire with various scenarios that participants were asked to address, regardless of whether they were exposed to the autobiographical memory treatment or not. The control group would be in a neutral emotional state. It is expected that fear results in biased decision making causing individuals to utilize a type one style of thinking.

---

Olivia Withers  
Theatre  
Facult Sponsor: Terry Jachimiak  
McKelvey Campus Center Witherspoon, 9:45-10:45 a.m.  
Funding Received from the Drinko Center

**Advancing Techniques in Stage Management**

A stage manager is a person who is responsible for the technical details of a theatrical production, assisting the director during rehearsals, supervising all areas of design, and assuming responsibility of the cast and stage during the run of a show. The stage manager is responsible for creating the paperwork that keeps a show running. While at the Kennedy Center American College Theatre Festival, I presented the work that I had done on two shows at Westminster and learned new techniques to bring back to the Theatre Westminster.

---

Zachary Woessner  
Chemistry  
Faculty Sponsor: Dr. Peter Smith  
McKelvey Campus Center Witherspoon, 12:30-1:30 p.m.

**Synthesis of europium(III) silicates using microwave-assisted hydrothermal methods**

Rare earth oxyorthosilicates belong to a known group of scintillator compounds—commonly used as γ-ray detectors in the medical industry. The primary method for producing rare earth oxyorthosilicates is the Czochralski method in which the rare earth oxide and silicon dioxide are combined and melted at incredibly high temperatures to produce a single crystal of the desired oxyorthosilicate. Due to the energy and time intensive nature of the current method, a new method is being proposed. Europium(III) nitrate and sodium silicate solutions were mixed together in approximately a 2:1 ratio; microwave-assisted hydrothermal methods were implemented. X-ray diffraction (XRD) and transmission electron microscopy (TEM) analyses were used to determine the structure and particle morphology of the synthesized crystals.

---

Cameron Worthing  
Chemistry  
Faculty Sponsor: Dr. Helen Boylan  
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.  
Funding Received from the Drinko Center

**Analysis of Commercially Available Solar Cells and Applications to Tiny Living**

With growing need for energy solutions, renewable energy must be developed as a viable source for energy in the near future. One application of this can be seen in residential situations, specifically those in which smaller living spaces are being utilized. The most notable place where solar power can be seen in this minimalistic residential setting is within the emergence of tiny homes. By establishing a minimalistic lifestyle, as well as drawing power from photovoltaic cells, we can greatly reduce our dependence on fossil fuels. A large variety of solar cell types are currently available for consumers; however, narrowing down the options can be extremely difficult due to benefits of each. This research looks at comparing some of the major, commercially available solar cells. Efficiency testing was conducted on all cells as well tests to estimate longevity and durability of the cells, and analytical tests were conducted to determine the chemical makeup of each cell type.
Tiny Living - Big Learning: Westminster’s Tiny House Project

Westminster College is integrating tiny living in a meaningful way into the liberal arts curriculum and providing students with the opportunity to live in a tiny house and gain first-hand experience with tiny-house living. Students and faculty are working together with professionals to create a tiny house that is sustainable and off the grid. The tiny house includes sustainable features such as solar panels, composting toilet, and rain water collection. The students involved in this project had the opportunity to travel to New York in Fall 2016 and learn about the construction process of a tiny house from expert Bill Rockhill. The tiny house itself was built by students, faculty, community members, and the New Castle School of Trades. The goal of the Westminster Tiny House Project is to create awareness of our impact on the environment and educate students and community members about sustainable living.

The Miracle Cleaner

The Jason Markk App is going to allow people all around the country to purchase premium shoe cleaners as well as send their shoes to the LA store shoes to be cleaned, restored, and “brought back to life” by our experts. Other features will allow users to watch videos that demonstrate the proper ways to clean the different type of materials from which shoes are made. This cleaner is the premiere shoe cleaner in the US. It has the nickname of the miracle cleaner. This app is for everyone of all ages, from the average person who just wants clean shoes, to the sneaker lover who needs their favorite Jordans cleaned and restored. The Jason Markk app will do it all.

Habitat use of American Kestrels and European Starlings in west-central Pennsylvania

American Kestrels are a common species in Pennsylvania. In June 2016, we established 28, 2-mile transects. At 3 locations along the transect, we conducted 6-minute stationary point counts. We conducted driving surveys between the stationary count locations. During the counts, we recorded locations of all kestrels and European Starlings seen or heard within 200m. We observed 6 kestrels on 5 separate transects and 550 starlings on all 28 transects. We used GIS to quantify land use (pasture, cultivated crop, forest, wetland, and developed) of each transect. We used logistic regression to evaluate presence and absence of each species in association with habitat type. Kestrels occurred in pasture and wetlands. Starlings occurred in diverse habitat types, but most often in areas with cultivated crops and near farm structures. These results are useful for directing placement of nest boxes for kestrels to best avoid competition with starlings and potentially maximize reproductive success.
Heather Zeitler  
Music Performance  
Co-authors: Braden Ball, Vincent Buell, Courtney Labritz, Robert Sutton  
Faculty Sponsor: Dr. Timothy Winfield  
McKelvey Campus Center 1st floor, 9:15-9:25 a.m.

First Year Brass Quintet

The First Year Brass Quintet will be performing “Oh Shenandoah,” the traditional American tune, arranged by Ryan Wolf; “Viva La Vida,” originally by Coldplay and arranged for brass quintet by Brandon Ridenour; and the Sonata from “Die Bänkelsängerlieder,” written by Anonymous and edited by Robert King.

Madison Zerfoss  
Public Relations  
Faculty Sponsor: Dr. Brittany Rowe-Cernevicius  
McKelvey Campus Center Witherspoon, 1:45-2:45 p.m.

Use of Social Media as a Recruitment Tool: ISIS v. Greenpeace

ISIS and Greenpeace may not have much in common at first glance, but these two organizations often use extreme social media tactics to recruit new members and raise organization awareness worldwide. Using Hallahan’s relationship management concepts (commitment, control mutuality, communality, trust, and satisfaction), this case study evaluates the successes and failures of both ISIS and Greenpeace’s use of social media as a recruitment tool. Social media posts as well as existing research articles on each group’s social media use were analyzed. This study offers insight on how Hallahan’s principles can be used to strengthen social media usage for recruitment purposes.

Melissa Zhang  
English  
Faculty Sponsor: Dr. Kristianne Kalata  
Patterson Hall 205, 12:30-12:45 p.m.  
Funding Received from the Drinko Center

A Psychoanalysis of Fifty Shades of Grey

My work, “A Psychoanalysis of Fifty Shades of Grey,” examines the characters of Anastasia Steele and Christian Grey through a psychoanalytic lens. Through an investigation of the characters’ relationships with each other, their parents, and themselves, I argue that Christian and Anastasia manifest the classic symptoms of a Freudian Oedipus and a Jungian Electra Complex, respectively.

Melissa Zhang  
English  
Faculty Sponsor: Dr. Deborah Mitchell  
Patterson Hall 205, 1:20-1:35 p.m.

Fakes and Phonies: Cognitive Dissonance in The Catcher in the Rye and Gone Girl

For my English capstone, I examined the character of Holden Caulfield through a primarily psychoanalytic lens. By investigating the contrast between Holden’s beliefs and his contradictory actions, my capstone argues that this subconscious hypocrisy, or cognitive dissonance, is a central source of Holden’s tension and anxiety. In addition, my work compares the post-war, superficial society of The Catcher in the Rye to the modern, media-saturated culture seen in Gillian Flynn’s 2012 work Gone Girl.