15TH ANNUAL CELEBRATION OF UNDERGRADUATE RESEARCH AND CREATIVITY
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Sunday, April 19
Honor Student Thesis Presentations
1 p.m. - Reception
1:30 p.m. - Session I
3 p.m. - Intermission
3:30 p.m. - Session II
Miles Hall, Rooms 145, 233, and 315

Tuesday, April 21
3 - 5 p.m.
Undergraduate Research Paper Presentations
School of Communication, Room 203

5 - 7 p.m.
Undergraduate Research Poster Session
Music by Schola Cantorum

Opening Remarks
President Joseph J. McGowan

Reception
Frazier Hall
The Lansing School of Nursing and Health Sciences established the Artist-in-Residence program in the 2002-2003 academic year. This program exemplifies the art and science of Nursing and Health Sciences through the eyes of the artist in music, visual art, creative writing, and/or drama. Endowed by Mrs. Arthur N. BecVar in 2006 in honor of her husband, this program exemplifies the diverse and many creative and artistic talents of the BecVar family. Having earlier established an endowed nursing scholarship fund during Art’s lifetime, with this endowment Jayne BecVar further connects her desire to support and provide to our community caring, ethical graduates. It is our mutual desire that the students’ experiences in this program, as viewed through the arts, will give them new ways of thinking to inform their clinical practice, the health care profession and patient contact and care.

Artist Statement
Cover Art: “Ventilator on Monstera Deliciosa”
By Anna Blake, 2014-2015 Artist in Residence
The BecVar Artist-in-Residence program has allowed me to learn so much about respiratory therapy and meet students and professors that I would have never met otherwise. The hard work that students, teachers, and health care workers do is so important to all of us and my piece focuses on recognizing that. After sitting in on respiratory therapy classes, I noticed that many of the technology and procedures used on patients mimics the way the respiratory system naturally works. My piece uses images of equipment used in respiratory therapy digitally overlaid on plant leaves to create a conversation about the connection between nature and our health.

ABOUT THE ARTIST IN RESIDENCE
Anna Blake

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Social Justice Discourse
Amanda Eichelberger / Faculty Sponsor: Prof. Mith Barnes, Interdisciplinary Program Instructor

Abstract: The focus of this research paper is to interpret the workings behind the racial disparities found in America’s ‘pseudo’-egalitarian criminal justice system. Michel Foucault’s theories are applied when deducing the racial injustice found in the 21st century. Foucault’s concepts are addressed from the origins of ‘state racism’ into contemporary America. His theories of the relationship between power and knowledge are discussed as forms of social control through social institutions. Foucault’s cycle of discourse is pragmatic when analyzing hierarchies in various fields of knowledge. When examining the causes of segregation, racial orderings, and social hierarchies Foucauldian ‘techniques of power’ are applied. There is a necessity to analyze the history of the United States along with the exclusions throughout history that have been neglected. This research is therefore aimed to unravel the causes and origins of the racial injustices that hobble the nation today.

Sentencing Disparities on Cocaine Cases
Kayla Padgett / Faculty Sponsor: Prof. Mith Barnes, Interdisciplinary Program Instructor

Abstract: Historically, the sentences related to crack cocaine and powder cocaine have shown great disparities. This study looks at the history of the sentencing guidelines when dealing with the various types of cocaine and to see how the course of history has improved these inequalities prevalent in the criminal justice system. The goal is to determine the foundation on which disparities in sentencing against crack and powder cocaine are developed from and how the laws have changed over time. The data from the Federal Justice Statistics of 1999 and 2012, provided by the U.S. Department of Justice, have the given information needed for a secondary analysis of this proposal. This study may later be used to continue analyzing and give understanding to the improvements made toward drug sentencing, specifically cocaine. Those involved with the distribution, or dealing, of crack cocaine have had greater sentences than those of the cocaine counterparts: powder. The issue revolves around the texture of the drug as well as many demographics related to the suspect. The following study is a compilation of the research done on the history and the developments of the criminal justice system. It provides the strides in recent history of the United States that has worked towards equal sentencing laws for two variations of the same cocaine based drug.
Naruto’s Relevance within Orthodox Christianity

Ke’Leb Beauchamp / Faculty Sponsor: Prof. Mith Barnes, Interdisciplinary Program Instructor

Abstract: This project seeks to explore the universal appeal of specific anime and manga, and to show how arguably it is of academic interest because it references on bigger topics such as religion, like Christianity, in order to inspire conversation. This has been done by research examining Japan’s culture being impacted by outside cultural things such as religion through primarily looking at a specific example of an internationally popular manga-based anime, Naruto and its correlation with orthodox Christianity by comparing and contrasting it with elements of the Bible; in addition to using these primary examples to directly relate them to other works including, but not limited to: Kwame Anthony Appiah’s Cosmopolitanism: Ethics in a World of Strangers and Patrick Drazen’s essay, Mangatopia. Works, that speak on the advantages of cultures impacting one another with Drazen’s Mangatopia, going further, to suggest that anime is pedagogically ingenious because of how it blends foreign concepts like religion and is willing to comment on it. It becomes clear that the substantial evidence presented, highlights the importance of acknowledging anime as not only relevant, but rich to anyone wanting to discuss various larger topics such as religion.
Undergraduate Scholarship Poster Session

SPECIAL THANKS TO

Dr. Joseph J. McGowan, President of Bellarmine University
Dr. Doris A. Tegart, Provost
Dr. Jay Gatrell, Assistant VP for Institutional Effectiveness, Research & Graduate Initiatives
Mr. Hunt C. Helm, Vice President of Communication & Public Affairs
Ms. Joan Riggert, Director of Planned Giving & Stewardship
Ms. Connie Hurley, Grant & Research Specialist
Ms. Allison Becker, Secretary to the Dean of Bellarmine College
Mr. Brad Craig, Creative Director
Mrs. Kathleen Kelty, Director of Campus Communications
ACCOUNTING

POSTER 1

How U.S. Tax Law Allows For Offshore Accounts

Caroline Link / Faculty Sponsor: Ms. Alisha Harper

Most people in America know that companies such as Apple, Inc. pay very little US income taxes. However, What most people do not know is that Apple structured its offshore transactions in such a manner that it owed very little income tax under the U.S. tax law. My project will show just how Apple was able to set up offshore accounts to avoid US taxes and operate completely within the US tax law. I will do this by showing the Apple offshore corporate structure in conjunction with the tax law that allows Apple to do this.

ART / ARTS ADMINISTRATION

POSTER 2

An artist’s interpretation of youth smoking and its effect on physical activity

Anna Blake / Faculty Sponsors: Ms. Caren Cunningham & Dr. Jerome Walker

A commissioned artist’s representation of a journal article “Physical activity and nicotine dependence among a national sample of young U.S. adults who smoke daily: Evaluation of cross-sectional and longitudinal associated to determine which behavior drives this relationship.” The study found that more cigarette-dependent 16-22 year-old smokers are less physically active at baseline and 2-years later. However, baseline physical activity does not associate with nicotine dependence or smoking status after 2 years. Nicotine dependence appears to influence physical activity as opposed to the reverse pathway. Appearing on the cover of the February 2015 issue of the journal Physiology & Behavior, this work was translated into an archival inkjet print made using the silhouette of a man and several images of smoke from a stick of incense, which was given its color in Photoshop to appeal to the viewer and draw the eye to the subtle shape of the silhouette. The colors dominate the otherwise monotone silhouette, suggesting the way that nicotine dependence can dominate aspects of a person’s life, including physical activity.
Plants are hosts to a vast microbe population called the phyllosphere. The phyllosphere is the surface of the plant above ground that serves as the habitat for microorganisms. The microbes that live in the phyllosphere can be symbiotic, pathogenic, or have no effect on the plant. The purpose of this research was to explore the flower surfaces of various plant species to gather information about whether phyllosphere bacteria are host-specific, geographically-specific, or a combination of the two. Phyllosphere bacteria samples were collected from the flowers of seven different plant species: Ficaria verna (Fig Buttercup), Cirsium texanum (Texas Thistle), Solanum carolinense (Horse Nettle), Delosperma cooperi (Pink Carpet), Buddleja (Buzz Magenta), Rosa radrazz (Knockout Rose), and Tagetes (Marigold). The petals of these flowers were swabbed and plated onto microbiological plates. Individual bacterial colonies were subcultured and genomic DNA was extracted and amplified by PCR of the 16S ribosomal RNA. The PCR products were purified and DNA sequences were obtained so that BLASTn searches of the DNA GenBank could predict the identity of the bacteria. Seventeen different bacterial species were isolated including Enterococcus faecalis, Enterobacteriaceae bacterium, Bacillus anthracis, Staphylococcus haemolyticus, Staphylococcus succinus, and Serratia marcescens. Three of these species have been shown by other researchers to be nitrogen fixing. Five were pathogenic to either plants or animals, while six are known to promote plant growth. The type of bacteria observed on the flowers does not seem to be solely dependent on either plant species or geography. Based on these results, it appears that both geography and plant genotype influence the bacterial composition of the phyllosphere.
The phyllosphere is the above-ground surface of the plant that serves as habitat to many microorganisms. These microbes can be symbiotic, pathogenic, or have no effect on the plant. To better understand the interactions between plants and microbes, bacterial communities were collected from the foliage of eight common vegetable species. Samples were collected from the leaves of the following plants: green pepper, habanero pepper, okra, tomato, corn, pumpkin, birdhouse gourd, and eggplant. These plants were sampled at the same location (a local farm in Southern Indiana) in September. A sterile cotton applicator was used to swab the bottom of the leaves of each plant and spread onto sterile microbiological plates that were allowed to grow for 48 h. Numerous fungal species grew on the plates, but the focus of this study was on bacteria. Genomic DNA was extracted from 17 bacterial samples and used as template for PCR amplification of the 16S ribosomal RNA. PCR product was successfully produced in 10 of those samples. The PCR product has been purified and will be sent for DNA sequencing. If the basis of plant:microbial relationships can be better determined, it might be possible to adapt current agricultural practices to take advantage of them.
POSTER 5

The role of lipid raft formation during activation of ERK1/2 by cadmium and arsenite in human lung adenocarcinoma cells

Meera Patel / Faculty Sponsor: Dr. Mary Huff

The environmental contaminants, cadmium chloride and sodium arsenite, have been shown to act as endocrine disruptors by activating estrogen receptors in breast and other cancer cell lines but their activities in lung cancer have not been determined. We have previously shown that treatment with nanomolar concentrations of cadmium and arsenite stimulate cell proliferation and activate ERK1/2 (MAPK) phosphorylation in the human lung adenocarcinoma cell line NCI-H1793 and that this activation is mediated through estrogen receptors (ER). The purpose of this study is to determine if lipid raft formation is required in this ER-MAPK signaling pathway. Our initial study was designed to establish the concentration and preincubation time necessary to prevent lipid raft formation using the inhibitor methyl-beta-cyclodextrin (MβCD). NCI-H1793 cells were treated with 2-10 mM MβCD, ranging from 15 minutes to 6 hours, followed by treatment with 100 µM 17β-estradiol to induce ERK1/2 activation, and the level of ERK1/2 phosphorylation was quantified using immunoblot analysis. Our preliminary results suggest that preincubating lung cancer cells for 6 hours with 10 mM MβCD was sufficient to inhibit 17β-estradiol activation of ERK1/2. We will now use these defined parameters to block lipid raft formation and determine if cadmium and arsenite activation of ERK1/2 is also inhibited. These results will further delineate the mechanism by which cadmium and arsenite induce ERK1/2 activation in human lung adenocarcinoma cells.

POSTER 6

Cytotoxicity of Chalcones

Miranda Schmidt / Faculty Sponsor: Dr. Amanda Krzysiak

Natural products have been a great resource in the discovery and development of pharmacological agents throughout history. Some of the greatest drugs including penicillin and taxol, both natural compounds, have successfully been used in the treatment of infections and cancer. Chalcones, a flavonoid compound and natural product, are found in many plants. Chalcones have been shown to have cytotoxic activity, the ability to kill cells. This is a property needed for the successful treatment of both infections and cancer. Chalcone derivatives have been shown to have many biological activities including: anti-cancer, anti-bacterial, and anti-parasitic. The development of novel molecules for the treatment of bacterial infections and cancer are paramount and chalcones have strong potential. This study seeks to evaluate the biological activity, specifically anti-bacterial, of a synthesized library consisting of 24 chalcones. Of the 24 compounds screened, 4 compounds demonstrated anti-bacterial activity. Compounds 1A1B and 1A2B demonstrated anti-bacterial activity against Staphlococcus aureus. Compounds 1A6B and 5A3B demonstrated activity against Eschishera coli. There was no detectable activity for compounds screened for activity against Pseudomonas aeruginosa.
Although smoking rates have declined significantly across all demographics over the past 10 years, consumption of nicotine through alternative delivery devices is on the rise, particularly among teens and college students. This disturbing trend is partially attributable to the increasing prevalence of retail locations selling these novel products accompanied by unregulated marketing of non-cigarette (or cigar) nicotine delivery devices. Likewise, due to misperceptions, and possibly deceptions, numerous establishments are operated in Louisville Metro that allow public indoor consumption of hookah in spite of a strong local ordinance prohibiting indoor tobacco smoking. From a societal norming perspective, the longer these establishments operate in a community, they become more entrenched in a distinct sub-culture therefore allowing them, and the activities that occur in them, to become an “acceptable” part of our society. While health advocates continue to work to reduce the negative impacts on economic and public health caused by nicotine addiction through improved health policies prevention research has shown that the increased availability and acceptability of new ways to become and remain addicted to this drug significantly undermine these public health efforts. This research project was designed to gain a better understanding of the impact and prevalence of these novel nicotine delivery systems in the college-age community in Louisville. Surveys of respirable particulate matter were conducted to assess air quality in hookah lounges. Individual surveys were conducted among college students on multiple campuses in Louisville Metro to determine awareness, current consumption and perceptions of risk associated with hookah and e-cigarettes. Results of these surveys are presented here.
Mold growth has plagued gross anatomy cadaver laboratories around the world, hindering the educational process to which cadavers contribute. In an effort to alleviate the aging tissue of the parasite, lab instructors have attempted countless times to create an environment in which mold could not grow. The application of wetting solutions is used to maintain the suppleness of tissue, and, without the inclusion of an antibacterial agent, can dilute embalming fluid and allow mold to cultivate. This project focuses on the design and experimental testing of five “in-house” wetting solutions along with one commercially marketed solution. Each one was tested for their effectiveness on the inhibition of mold growth while simultaneously maintaining the viability of the tissue for teaching purposes. Four common molds were selected for testing with each wetting solution. The efficacy of the solutions on the mold growth was tested by applying the solutions at different time intervals to mold grown on agar plates. Using the XTT assay which measures metabolic activity, the fungicidal effects of the solutions and the effectiveness of each was determined. Prepared samples of each solution were compared visually for their effects on the integrity of cadaver tissue. Five of the six solutions were found to be successful in inhibiting the in vitro growth of mold when applied at different stages of growth without altering the tissue structure for teaching.
Binding Interactions Between MIT Domains and MIMs Within the ESCRT Pathway

Ashley Fields / Faculty Sponsor: Dr. Mary Huff

The Endosomal Sorting Complexes Required for Transport (ESCRT) pathway plays a key role in cellular membrane remodeling and scission. The ESCRT pathway has roles in enveloped virus budding, exosome formation, and abscission, which is the final stage of cytokinesis. The ESCRT pathway contains four complexes, ESCRT-I, ESCRT-II, ESCRT-III, and VPS4, that act sequentially in the membrane remodeling process. The late-acting ESCRT-III proteins are recruited to membrane bud necks and are responsible for membrane constriction and fission. The ESCRT-III proteins also recruit cofactors, many of which contain MIT domains, including VPS4A, Katanin, and ULK3. The C-terminal tails of the ESCRT-III proteins contain elements called MIT Interacting Motifs (MIMs). These MIMs bind to various surfaces of the MIT domain. My goal is to figure out what dictates the binding interactions between different MIT domains and ESCRT-III MIMs. These MIT domains are found in many different enzymatic and regulatory classes of proteins and they all vary in ESCRT-III specificity. My research project is to clone, express, and purify the MIT domains and perform binding experiments to discover their preferred ESCRT-III binding partners. Towards this end, I have cloned MIT domains from the proteins Spastin, Katanin, KataninL1, AMSH, AMSH-LP, and SNX15 and purified the MIT domain from VPS4A. I have also measured the binding between ULK3 MIT domains and its ESCRT-III binding partner IST1. Learning the “rules” that dictate interactions will help us understand how these MIT domains function with the ESCRT pathway.

The Effects of Withaferin A in Combination with Carboplatin, Paclitaxel, and Doxil on Ovarian Cancer in Vitro

Kara Garcia / Faculty Sponsor: Dr. Mary Huff

Ovarian cancer is the most fatal gynecologic cancer in the United States. This is attributed to 70% of women with ovarian cancer developing platinum resistance in response to the chemotherapy. Carboplatin, in combination with paclitaxel, is the main chemotherapy combination for ovarian cancer. When women become chemoresistant, doxil derivatives are used for treatment. In this experiment, the effect of Withaferin A (WFA) individually and in combination with these drugs was studied. These effects were studied via cell proliferation assays, isobologram analysis, and Annexin V-FITC FACS analysis. The isobolograms showed that Withaferin A has synergistic properties with carboplatin and doxil. In the cell proliferation assays and FACS analysis, Withaferin A increased the cytotoxic effects of the drugs it was combined with. Withaferin A in combination with chemotherapy currently in use could become a novel treatment improving chemotherapy effectiveness and lower the doses of noxious chemotherapy drugs.
The study as carried out was a survey of the torsional strength of the long bones of various species. Most species originated in Africa, with a focus on those animals that would be easily comparable and useful as a data set, primarily ungulates. Out-group animals were also included for comparison. Bones were obtained from the Louisville Zoological Gardens and frozen. Cleaning was done manually. Bones were potted in concrete to facilitate breaking. Before testing, the circumferences were measured and used to calculate cross-sectional area with the relationship $c=2\pi r$ and $A=\pi r^2$. Tests were carried out in a custom apparatus designed and built for this type of study. Torsional strengths varied widely from a minimum of 26.8 newton meters to a high of 252.2 newton meters. The fracture patterns were consistent spirals. Ashing of the bones was carried on pieces from the diaphyses. These fragments were dried at approximately 100 degrees and masses were taken. Fragments were fired at over 900 degrees for at least 8 to 10 hours. The pieces were cooled and the ash weight was taken. These two masses were used to calculate the ash fraction, which varies little, from 63% to 73%. Bone circumference ranged from 4.1 cm to 16.35 cm. Area ranged from 1.3 cm$^2$ to 21.3 cm$^2$. Force values were compared and correlated to three different variables: circumference, cross-sectional area, and ash fraction, with linear regression on preliminary data indicating the relationship is strongest between bone strength and the size variables, with little correlation to the ash fraction.
POSTER 12

PWREP, What's That Mean to Me?

Heidi Blocker / Faculty Sponsor: Dr. Matisa Wilbon

The past two summers I have worked at the Newburg Boys and Girls Club as a program aide, and during the school year, I volunteer at the facility on Monday afternoons. The majority of my time is spent in the club’s education room helping the members with their homework. The educational coordinator at the club identified language arts as an area of struggle for many of the members, so for my Capstone Project, I would like to develop a project that will teach the members language arts skills in a creative and fun manner. The project will be for three second-grade students to engage in a writing program at the club. The members involved will develop knowledge of the writing process and show that knowledge through the creation of their own works of their own books. The three prongs of the Brown Scholar Program will be incorporated into this program. Ensuring that the program is enjoyable for the students while ensuring that they learn the writing process will be challenging, so I will need to be creative in my approach of communicating the information to the members. My hope is that the three students I work with will learn the process of writing but also learn to love writing and view it as a valuable skill.

POSTER 13

Bellarmine and the Center for Women and Families: Building lasting relationships

Greg Clayton / Faculty Sponsor: Dr. Matisa Wilbon

I am a Senior Criminal Justice and Sociology major. My presentation will go into detail about the project I completed for Brown Scholars. This project centers on a panel I planned in cooperation with OwnIt and the Center for Women and Families. This panel was a discussion about men’s role in promoting gender equality, and featured both Bellarmine faculty members and staff members from the Center/OwnIt. The project also began the creation of an annual internship with the Center for Bellarmine students and linked OwnIt representatives with other campus faculty in the hope of involving them in future campus events. This internship was built to create a lasting relationship between the school and the Center and provide invaluable experience for students aspiring to make a positive social impact in their future careers.
POSTER 14

Database Manual Revamped
Ashley Corley / Faculty Sponsor: Dr. Matisa Wilbon

As a volunteer at Down Syndrome of Louisville I created a manual that explains and describes the procedures needed to use their database. The organization relies on this database a great deal, to enter donations from fundraisers, keep track of who is involved with the different activities, and to determine which member with whom the individuals in the database are affiliated. The organization wants to be able to recognize the individuals that donate to them and keep track of the money raised from each event. By creating this manual it will help new and previous employee's learn how to enter data efficiently and effectively. Throughout this experience I communicated and work closely with the organization's office manager in order to make sure that the organization's ideas are implemented in the manual and most importantly to make sure that vital information is not missed. Ultimately, having this manual will greatly impact the effectiveness of the services provided by Down Syndrome of Louisville.

POSTER 15

Game Night with Purpose
Casey Guernsey / Faculty Sponsor: Dr. Matisa Wilbon

This project is purposed to foster the relationships between the learning communities at Bellarmine University and St. Vincent de Paul Homeless shelter.

I have devised a curriculum for a biweekly interactive volunteer program for students in the Brown leadership and Galileo Learning Communities. This program is an opportunity for Bellarmine to connect and give back to the local community. These visits to the homeless shelter include interacting with individuals at St. Vincent de Paul through a board game night accompanied by discussions led by Bellarmine volunteers. Bellarmine students lead discussions predetermined by the set curriculum.

This type of interaction between the less fortunate and Bellarmine students will include individuals of all ages and promote different levels of conversation among those who participate in the game and discussion biweekly event. Bringing board games to these discussions makes for a more inclusive environment. Adults as well as children are able to participate in these activities.

I put together a guide for topics that should be discussed as well as how to choose topics for discussion with those in the shelter. The guide also includes a way to lead these discussions for the student volunteer.
Music Literacy Project

Amy Harless, Aimee N. Johnson, Marissa R. Thomas, and Kesley Moorefield / Faculty Sponsor: Dr. Conor Picken

This Music Literacy Project allows middle school students to develop a familiarization with musical disciplines before the high school level where they can foster their skills as future musicians. The project is an after-school program at the Nativity Academy, an independent Catholic middle school that services students from families that express financial needs. Due to this wide availability for more sessions, there is potential for an internship program between the Nativity Academy and Bellarmine University music majors, making the project sustainable over the long term. The Music Literacy Project seeks to address the problem of arts being underfunded by introducing music to the students so they can continue their musical education with more focus in high school. The group has been certified through a safety training process held by the Archdiocese of Louisville. The curriculum for the session has been developed and revised to be inclusive of as many musical disciplines as possible. This curriculum, mixed with the feedback and interests of the students, will allow the students to be introduced to many different forms of music disciplines in a relatively short amount of time. The students in the program will be able to determine their musical interests in a safe, comfortable environment without exclusionary financial investment. The effectiveness of the program will be gauged by the establishment of the internship program coupled with the direct feedback of the students. By bringing music down to an approachable level for new students, the project combines the arts with a college bound attitude that encourages young scholars to both succeed academically and develop comfort in a productive outlet of expression and creativity.
I recently went to Quito, Ecuador for a month with the Bellarmine nursing program to study nursing leadership in healthcare. During those four weeks I followed nurse leaders four days a week for eight hours a day learning about nursing leadership styles and skills in Ecuador. I followed nurse leaders/mangers, learned hospital processes, evaluated Hospital Metropolitano in comparison to hospitals in the United States, and offered ideas of improvement. At the end of our stay, I had to complete a presentation for the nursing administration on a topic in the hospital we thought could be improved upon. I found that the hospital lacked in their care plan process. Their nursing care plans were focused on diagnosis and not the individual. The care plans were one dimensional and assessed only one part of the individual health, unlike the individual care plans the U.S. which are multidimensional, assessing all aspects of a patient’s illness. I presented to the nursing administration on the importance of individualized care plans, how to make one, and the positive effects it can have on nursing care. For the presentation, I had to present the entire presentation in Spanish. To effectively present the entire presentation I used hand gestures, app translators, my professor, other student on the trip, and the one hour Spanish class I took on the trip.

To bring this information to the community, I presented my experience to a nursing leadership class and taught them the importance of individualized care plans and how they can benefit nursing care.
POSTER 18

Bellarmine Helps Veterans

Ryan Knapp, Elizabeth Davish, Craig Skinner, and Trevor Williams / Faculty Sponsor: Dr. Matisa Wilbon

The purpose of this capstone project is to partner with the Volunteers of America to raise awareness around veterans’ issues, to raise money and supplies for their Veterans of America program, and to encourage local veterans by connecting them to Bellarmine students. The two needs identified by Volunteers of America were fundraising, and blanket and towel donations. Our first plan to address these needs were to partner with RHA (Residence Life) to place collection bins in the halls during move out and move in times to collect blankets for homeless veterans. The long term goal is for this to become part of the residence life culture so that blankets are collected for veterans during these times during the academic year. A second plan of action was to host a “Water Olympics” during the spring semester as a fundraiser for Veterans of America. The admission price was $2 or a blanket/towel donation. There were also tables with information where students could learn about issues related to veterans and where they could write letters to them. The impact of this project is two-fold: 1) The Bellarmine campus became aware of veterans’ issues while raising money for their cause and 2) a connection was made between RHA and the Veterans of America that we anticipate will be sustained.

POSTER 19

Healthy Habits: Teaching Personal Wellness to the Residents of Cedar Lake

Marrie Koch / Faculty Sponsor: Dr. Matisa Wilbon

Cedar Lake is a far reaching organization in our community. They care for hundreds of intellectually and developmentally disabled individuals throughout the Louisville area so that they may experience as full and fulfilling life as possible. My project worked with this organization on an idea they were developing to lead monthly health and wellness classes for these individuals. These classes teach everything from personal hygiene and physical activity, to topics like stranger danger. This program will help to reinforce the basic activities of daily living in a way that is both meaningful and fun. We hope that this program will garner enough enthusiasm and support that we will be able to reach a larger population of residents and one day be taken over by one of the Cedar Lake facilities so that it may run indefinitely.
Respiratory Illness and Poverty in the Dominican Republic

Shannon McKenna / Faculty Sponsor: Dr. Matisa Wilbon

Even with all of the resources at your disposal, living a healthy lifestyle can be an ongoing challenge. This challenge is magnified when you have no electricity, no running water, and no money for proper nutrition or medication. Through physical assessment and personal interviews, it was determined that this is the norm for most people in the poverty-stricken regions of the Dominican Republic.

By researching the materials available to the Dominicans, amending my knowledge of nursing care, and incorporating English to Spanish translation, I was able to teach members of the Dominican community realistic ways to manage some of their most common respiratory ailments. While my audience conveyed an understanding of my presentation, I hope to report a decreased number of those suffering from respiratory illness during the team's annual visit in the summer of 2015. Ideally, the knowledge of symptoms management will become more widespread; thus, reiterating the benefits of incorporating a healthier lifestyle.

Traditional and Modern Medicine in Ecuador

Katherine Nicieza / Faculty Sponsor: Dr. Matisa Wilbon

I recently had the opportunity to study abroad in Ecuador for a month with the Bellarmine University nursing program. While there, I studied nursing leadership in healthcare and different styles of medicine within Hospital Metropolitano, Jambi Huasi, and Shaman in the Amazon Jungle. Although there are many similarities in traditional medicine practiced in Ecuador and modern medicine practiced in the United States, there are also significant differences. One thing I discovered is that to be an effective health care provider in another country, one must also be culturally competent. For my senior project I was invited to train students who are part of Timmy Global Health, an organization founded by two Bellarmine seniors, as they travel to Ecuador for a medical mission. The Ecuadorian culture has historically rejected modern medicine so traditional medicine has proved to be a way in which health professionals can connect with Ecuadorians.

To train those traveling to Ecuador, I developed a manual detailing the differences between traditional and modern medicine in addition to how doctors and Shaman in Ecuador work together to merge the two different practices. I also added some of the similarities and differences between Ecuadorian medicine and medicine in the United States to help students understand culturally competent ways in which to treat those they will be serving. The manuals and training will hopefully be available to any students in the future looking to travel to Ecuador for medical missions or study abroad opportunities through Bellarmine University and Timmy Global Health.
For our Brown Leadership Community Capstone Project we are creating the organizational structure for the BraveBU Campaign. Our BLC Capstone group consists of McKenzie Prince, Mikala Smith, Lauren Troxell, and Anne Klosterman. We are working on the BraveBU Campaign with Assistant Dean of Students, Elizabeth Cassady. Informing campus of the campaign is the immediate need. The systemic need and change we are making is to design the organizational structure that runs the BraveBU campaign. The organizational structure will be student lead committees. BraveBU will be a student lead organization that works under the guidance of Elizabeth Cassady. We intend to create four committees, each revolving around a specific topic that BraveBU addresses; Committees include: Drug/Alcohol, Eating Disorders, Mental Illness, Sexual Assault, and a Public Relations Committee. This change is effective because we are creating an organization structure for BraveBU. This project will be sustainable because once we are no longer a part of BraveBU the organizational structure will function and new students will serve in committee roles. Our presentation will demonstrate the process to create the BraveBU organizational structure as well as the actual Brave BU Campaign organizational structure.
Kids Against Hunger-Louisville Volunteer Expansion Program

Kendra Regner / Faculty Sponsor: Dr. Matisa Wilbon

Kids Against Hunger-Louisville is an organization that works diligently to provide meals to children both locally and abroad that often go hungry. Kids Against Hunger-Louisville partners with non-governmental groups, often faith-based, who are on the ground at various global locations ensuring the meals sent are properly utilized. Kids Against Hunger-Louisville has recently experienced a considerable expansion and is now requiring additional personnel to run their program on a limited budget. In order for Kids Against Hunger-Louisville to continue expanding both their program and their impact, they suggested a re-design and re-launching of their current volunteer system and recruitment process. New promotional items were designed and distributed to both current and potential volunteers, as well as to corporate individuals to promote the financial support of the program. The launch of an online volunteer sign-up system was also implemented. Through this re-design and re-launch volunteer campaign, we expect a rising and sustainable influx of volunteers with a new tri-layer volunteer system. The benefit of this new system is that is allows for a heightened level of freedom and flexibility for an increasingly positive volunteer experience and encouraging the longevity of volunteer support.
Building Publicity for the English Conversation Club

Emily Schmitt, Kelli Goings, Sam Parkison, and Kyle Warden / Faculty Sponsor: Dr. Courtney Keim

This project aims to increase communication for a local Non-Profit organization in the Louisville area. Specifically, we plan to help the English Conversation Club (ECC), an organization that helps people to speak English more fluently, to communicate more effectively to the surrounding community about the services ECC offers. We also aim to help ECC have better communication with the Louisville community to increase the number of volunteers at the organization. ECC has to keep up a relationship with the public because people learn and move on from the program. Our group will work with ECC to get the word out to the communities that have the most refugees, by putting flyers up and by talking to people in the community who could use their services. We will also create a Facebook page, posting pictures and videos to inform the public about what ECC does and their needs. The change we hope to make is in the way ECC gets the word out about the organization.

Meeting the criteria of the Brown Leadership Community Capstone project, we will know if this change is effective through an increase in the number of learners using ECC’s services and an increase in the number of volunteers. Our plan will be sustainable because we will train other volunteers to post on the page so it stays current. This project shows leadership and community engagement by taking charge of promoting an organization that needs help in the area. With the number of people that come to learn, ECC struggles for volunteers to meet the demand. We aim to be leaders in our community by helping to promote the ECC.
Volunteer Transportation

Hunter Smith, Lakin Pack, and Meg Carani / Faculty Sponsor: Dr. Conor Picken

For our Capstone project, we aim to help multiple organizations acquire the volunteer help they need. These organizations include, but are not limited to, English Conversation Club, Americana Community Center, and Good Garbage. The need we identified is for volunteers to help keep these organizations going strong with organized transportation for would-be volunteers. This issue is systemic in that transport is generally the main barrier to volunteers being able to reach out in their communities, as not all students have cars on campus and not all students are able to make such trips within their means. If these volunteers are unable to reach out to these organizations, their operations will suffer, and aid to their community will be affected negatively. We co-created this initiative after realizing this barrier to the volunteering experience, and that organized transportation would alleviate this issue. We plan on providing this transportation by contacting SGA about use of their shuttles. We will also contact the organizations about our volunteer transport system, to let them know how many volunteers to expect. This project will reach sustainability as we (and SGA) institutionalize it as another continued service that Bellarmine provides to ensure ongoing relationships in the community.

Volley for Hope

Kelsey Walsh / Faculty Sponsor: Dr. Matisa Wilbon

Volley for Hope is a volleyball tournament with a greater meaning than just competition. It is a project built upon the values of community, service, and leadership. Volley for Hope is a fundraiser for a local non-profit organization called Scarlet Hope with two main goals in mind: to raise awareness and funds. Scarlet Hope is a religious non-profit organization that seeks to send God's love to sex workers in the Louisville area with their main goal of being a stable part in these women's lives and show them that they are worthy. When women want to leave their previous lifestyle Scarlet Hope aims to give them counseling, a home if necessary, life skills, and helping them re-enter society with a job. This volleyball tournament spread awareness about this local organization, educated people in the community through flyers, testimonies, and T-Shirts, as well as gave 100% of the proceeds to help send women through their program. This was not just a fundraiser or leadership project but an opportunity for Louisvillians to come together for a greater cause that created a lasting impact on women wanting to transition out of the sex industry.
There are a multitude of non-profits in the Louisville area. While some are extremely well known, others don’t benefit from the same opportunities of getting media recognition that they deserve. While working for Learfield Sports Properties I realized there was a lack of options for non-profits to market through University of Louisville athletics. Marketing at Louisville athletic events is extremely expensive. For my project I will set-up a sustainable option for non-profits to be exposed through Louisville athletics.

Many opportunities through Louisville go unused because, for the most part, there is lack of demand for marketing to the public at events other than Louisville basketball and football. Recently, there has been a greater following for the Louisville baseball team because they have had successful previous seasons and are joining the prestigious ACC baseball conference.

I proposed a non-profit weekend to Learfield, who controls the marketing for UofL sporting events. As a result, there will now be a weekend series dedicated to marketing for non-profit organizations. These weekend series events last for 3 days over the weekend. I will get 10 non-profit organizations at each game, so there will be a total of 30 organizations able to market through Louisville athletics.

The impact this could have for the non-profits will only be positive. I will mix in well-known non-profits along with lesser-known names. If all goes well, all of the non-profits will gain exposure, volunteers, and more funding for their programs. This weekend is intended to be a yearly event after I complete my internship with Learfield.
POSTER 27

Saint Vincent de Paul: Empowering Children in Communication

Carrie Zanone / Faculty Sponsor: Dr. Matisa Wilbon

The Saint Vincent de Paul is a Catholic lay organization devoted to helping the homeless and others in need. They have an open hand kitchen as well as a shelter. Each Catholic Church in town has a chapter for members of that church; they raise money to help people pay a portion of their bills, put angel tree gift and food baskets together at Christmas, and anything else needed to assist the community. I have volunteered at the Saint Vincent de Paul since high school and I am a Vincentian in the chapter at my own church.

For my project, I assisted a teacher at the Saint Vincent de Paul who teaches children of the parents being helped by the Saint Vincent de Paul. We met once a week for eight weeks as part of the S.V.D.P. after-school program to discuss interpersonal communication and to further develop these skills. I researched interpersonal communication prior to every class taught. Communication is a topic that is so commonplace in everyday life that it can be overlooked but is a much-needed skill in everyday interactions. Because it is used daily, it is essential to learn ways to perfect these skills. These communication skills will help the kids to later become better speakers at work, at home, and in their community. This program showed the middle school students at Saint Vincent de Paul the importance of honing their communication skills, to help them strengthen these skills, and to empower them to be great leaders themselves one day.

CHEMISTRY

POSTER 28

How Much Arsenic Do Local Apples and Apple Cider Contain?

Anne Daniels / Faculty Sponsor: Dr. Wendy Foulis

A study at the University of Washington discovered more than 10 ppb arsenic in apple juices, which exceeds the maximum allowable level of arsenic in drinking water in the United States. It is unknown whether the arsenic comes from the apples themselves or is introduced into the juice during processing. An analysis of apple cider and apples from Huber’s Orchard and Winery was performed to determine the location of the arsenic in the apples and the cider. Flesh, seeds, and skin samples taken from three types of locally grown apples were tested for their arsenic content using graphite furnace atomic absorption spectroscopy. Samples from three different half gallons of apple cider were also tested. The results of this experiment could aid in determining in which portion of the apple the arsenic is stored and help decrease the amount of arsenic present in apple juices.
The Ohio River is the source of all water supplied by the Louisville Water Company as well as a recreational area for those who live in and around the Louisville area. Pesticides, petroleum, and other organic pollutants are likely to have washed into the local water source and may be at a detectable level. Utilizing a cautious soil sampling regime along with accurate separation techniques, organic extracts were obtained in a form that was suitable for injection into a Gas Chromatograph / Mass Spectrometry (GCMS-QP5000) instrument. The results obtained from these tests show that contamination is present, likely some in the form of petroleum distillates. At the time of this abstract submission further results were needed to determine exactly all the future steps that our project would be taking. We will however provide a list of contaminants found, their concentrations, and make comparisons to literature values of levels in which these materials may be dangerous to the broader ecosystem. Additionally, a search of the available literature will be undertaken to determine the possible origins of these molecules along with how these substances are filtered out by the water distribution company before human consumption.
Jacob Bryant and Chris Weaver Band Concerts

Anna Duzane, Matt Higgs, Reid Wesley, Liz Carlson and Brooke Cauhorn / Faculty Sponsor: Mrs. Stacie Shain

Jacob Bryant and the Chris Weaver Band are two up-and-coming country music artists. Bryant has played for many years and moved to Nashville, Tennessee, to further his career. He has shared the stage with many of country music’s greatest artists, including Eli Young Band, Easton Corbin, Kentucky Headhunters, Drivin’ N Cryin’ and David Allen Coe. Chris Weaver comes from a performing family and has great plans to make it big.

Jeff Catton manages Bryant and Weaver. Our goal is to plan a successful concert for both Bryant and Weaver. We plan to survey Bellarmine University’s student body as well as the public to find out their interests. We want Louisville to know Bryant and Weaver and to bring their fans out to a fun night out in Louisville.

We will use the tools of marketing and advertising to promote this concert to the best of our abilities. Our team will come up with different ways to promote this concert and use marketing strategies to plan this event. This project requires research to understand our target market, event-planning skills and PR strategies.

The four P’s – product, price, place, and promotion – will be used while trying to factor in how to make a profit for these up and coming stars. The manager does not want this to be a benefit concert or a free concert by any means; he is strictly looking to make money for his artists as well as raise awareness for their music.

Our group will have to do some research on the artists to see how much they typically charge for a concert and then factor in how much people in Louisville are used to paying for a concert. When we come up with a price, we will start promoting the concert to our target market.
Jared Allen's Homes for Wounded Warriors

Brianna Ellis, Sydney Windell, Brycen Howard and Trevor Dean / Faculty Sponsor: Mrs. Stacie Shain

The purpose of this presentation is to demonstrate the work completed for the Jared Allen Homes for Wounded Warriors. As the group responsible for this project, we were asked to raise awareness for the organization’s annual Night-Op Golf Tournament in Arizona, as well as perform research on potential business sponsors. In order to do so, we created social media campaigns, researched local sponsorship opportunities and developed promotional materials for the sixth annual Night-Op Golf Tournament in May 2015.

Because the Night-Op Golf Tournament is in its sixth year, the marketing firm for Jared Allen’s foundation asked our group to create a new approach to raising awareness and sponsorships for the event. The firm gave us the freedom to create any means of promotion to present to them for possible use, outlining expectations for these materials along the way.

We performed independent research on local and national businesses that offered potential for sponsoring the event. Through our research, we were able to create promotional materials to be sent across the country to these businesses in hopes of building a relationship between them and the Jared Allen Homes for Wounded Warriors, especially with the sixth annual Night-Ops Golf Tournament.

Through our social media campaigns, sponsorship research and promotional materials, the Night-Op Golf Tournament is expected to sell out and reach a further audience than ever before.
The objective of our group is to put together a marketing campaign for the Lexington branch of Honor Flight. For this project, the first step is to research the company and target audience. The research will help us anticipate how the target audience, in this case veterans and volunteers, will perceive the campaign.

As the marketing team, we need to make sure that the campaign we provide for Honor Flight holds true to the company’s mission statement and that the audience is able to understand that mission and be moved to act. To accomplish this, the research needs to evaluate each neighborhood, or area, of Lexington in which we are marketing. That means we have to understand the beliefs and values of each geographical area so that the campaign can cater to those beliefs.

The marketing campaign will consist of a Public Service Announcement, a written feature story for newspapers, the development of stationary letterhead and a business card, a pamphlet design and a two-minute oral presentation. The goal of the campaign is to encompass the essence and mission of Honor Flight. The Public Service Announcement will be a prepared statement that the Lexington branch will be able to distribute to radio and television stations to promote the project.

The synergy, or cohesion, between all of the items of the campaign will convey the mission and passion of Honor Flight to its target audience.
We have paired with the Trent Green Family Foundation (TGFF) to represent their volleyball event raising money for HIKE, Ronald McDonald Playhouse, the YMCA, and Children’s Mercy Hospital foundations. The Trent Green Family Foundation is a non-profit organization based in Kansas City. HIKE is the organization that the TGFF created to build local libraries and establishments for children to learn.

Our tasks in this project include creating an event name, creating a logo design and slogan, developing a marketing sponsorship packet, creating and controlling social media accounts and developing a strategic marketing business plan. To maximize the most potential out of the project, we continue to research multiple events like this one. From sponsorship levels to local sponsors, we looked into what worked well for different organizations as they planned a similar event. By putting our specialty traits together, we have been able to put together a strong public relations plan for the Trent Green Family Foundation. Social media and press releases are our primary ways of reaching the public, along with partnering with HIKE, Ronald McDonald Playhouse, the YMCA and Children’s Mercy Hospital. This has allowed us to broaden our horizons and reach a greater audience to help raise money and awareness for a great cause.

This project allowed for the four group members to research and experience all of the assets of marketing and event planning. The Trent Green Family Foundation is hosting this event for the first time, and the group has been required to start everything from scratch. The focused area of research can be narrowed to the effects of marketing and design on a non-profit organization’s event planning. The effects of this project are long lasting and will provide many great opportunities for children in need.
U.S. Army Reserve Recruiting
Nic Kaniasty, Nick Reinhart, Maryashly Betz and Jacob Schuhmann / Faculty Sponsor: Mrs. Stacie Shain

What we know: The US Army Reserve is attempting to increase recruitment of 17-24 year old (Generation Z) qualified military available (QMA). Of this targeted QMA, the highest qualified typically have the lowest propensity to join (9%) and turn to college or the improving job market.

What we think we know: We sent a survey to our peers who fit the Army’s QMA demographic, but chose college instead of the military. Our survey compiled 177 people from all over the US, ranging in age from 18 to 30. 109 men participated and 68 women.

122 are not considering military service. A consistent theme is that they did not want to spend time away from home. 55 considering Navy service. This confirmed our hypothesis on why most people do not want to join the military. Our hypothesis was that people are not educated enough via the marketing to join the Army. We think a marketing plan where inspiration is paired with education we will be able to tap the markets currently needing to be recruited.

Generation Z
- Craves honesty. Gen Z wants to see stuff that’s real not just abstract ideas; they want to have a clear vision of what’s going on.
- Is more entrepreneurial. Gen Z wants to be a part of something that is bigger than themselves.
- Is not interested in the typical workweek.
- Wants to talk face to face.
- Knows what it wants. They know they want to generate change and be a part of something important or do something important.

What can we do?
- Instead of using the occupational approach where the perspective QMA is shown soldiers being whatever they plan on being as a civilian, show soldiers being something else ENTIRELY.
- This approach just launched by British Army Reserve.
- Show our military doing something extraordinary.
**POSTER 35**

**Ale8One Ambassador Program**

Zak Shankland and Dana Gramuglia / Faculty Sponsor: Mr. Chris Becker

We will be presenting our findings and research of Ale8One on campus presence along with some suggestions on how to tactically improve brand recognition and awareness on campus. We worked on creating a student ambassador program for Ale8One to be implemented on Bellarmine's campus last semester in Chris Becker's advertising class. We are happy to say the program will be implemented.

**COMPUTER ENGINEERING**

**POSTER 36**

**Vulnerability Analysis of Vehicle Networks**

Benjamin Turi / Faculty Sponsor: Dr. Muzaffar Ali

In the digital age, it feels as though nothing electronic is secure. Electronic devices like phones, computers, and even bank accounts are not out of reach of cyber adversaries. Controller Area Network Buses (CAN Buses), Electronic Control Units (ECUs) and other vehicle networking components have not yet been breached by everyday hackers, but under current standards remains very vulnerable and will eventually succumb to intrusion. The aim of this research is to present a vulnerability analysis of vehicular networking and its weaknesses. As technological entities, a vehicle and its associated hardware performs well; however, under the scrutiny of security, we must keep in mind the ability of a hacker (or possible environmental interference) to manipulate the bus and potentially cause in-calculable damage to persons or property. This research will not only present the current vulnerabilities of the CAN bus, but also propose security measures to make cars more secure. Hopefully, through this research, vehicle manufacturers will begin imposing more security measures and strengthen the safety of both the vehicle and its passengers.
We will present an inexpensive way of building a high performance computing Beowulf cluster using the Message Passing Interface (MPI), MPICH, using readily available, cheap Raspberry Pi’s. The challenges faced involving issues with using the Raspberry Pi will be discussed as well as any other possible options that could be used to replicate a similar cluster using off the shelf products. MPICH is a freely available, portable implementation of MPI, which is the standard for parallel computing applications. Differential timing outputs are provided in terms of number of processors used such that for performance calculations using the speedup ratio, which relates to the speed of performance over one processor compared to performance with multiple processors. These performance calculations will be evaluated in terms of running programs such as the number of primes within a certain range, password cracking algorithms as well as other algorithms that would be optimized if multiple processors instead of one dedicated one were used. The potential for this and other similar projects for use in Education will be discussed.
Throughout history, the sentences related to crack cocaine and powder cocaine have shown great disparities. This study looks at the history of the sentencing guidelines when dealing with the various types of cocaine and to see how the course of history has improved these inequalities prevalent in the criminal justice system. The goal is to determine the foundation on which disparities in sentencing against crack and powder cocaine are developed from and how the laws have changed over time. The data from the Federal Justice Statistics of 1999 and 2012, provided by the U.S. Department of Justice, have the given information needed for a secondary analysis of this proposal. This study may later be used to continue analyzing and give understanding to the improvements made toward drug sentencing, specifically cocaine. Those involved with the distribution, or dealing, of crack cocaine have had greater sentences than those of the cocaine counterparts: powder. The issue revolves around the texture of the drug as well as many demographics related to the suspect. The following study is a compilation of the research done on the history and the developments of the criminal justice system. It provides the strides in recent history of the United States that has worked towards equal sentencing laws for two variations of the same cocaine based drug.
"The Meadows"

Olivia Hart / Faculty Sponsor: Dr. Laura Needham

"The Meadows" is a documentary telling the story of Bardstown potter Matthew Gaddie. Gaddie, my uncle, has taken pottery from a hobby to a full-time career. His work is featured in galleries across the country, and he has built a wood-fired kiln and studio on a Bardstown farm. I was presented with the challenge to create a documentary that would be both interesting and pertinent to a wide audience. Though not everyone is interested in working in clay, most anyone can appreciate a story of hard work paying off - and Gaddie is the best story I know of this.

The film is approximately five minutes long. In order to display the film, I will bring in my own computer so that viewers can see the documentary. I also will make a poster that will display information not included in the documentary about Gaddie and a little about what went into making of the film.

The Coopers: A Short Documentary

Emily Mintman and Mary Beth Gorham / Faculty Sponsor: Dr. Moira O’Keeffe

The Coopers: A Short Documentary, takes viewers behind the scenes of the push for a professional soccer team in Louisville, KY. The Louisville Coopers, the local supporters group for professional soccer, became the voice of soccer fans in the city. Filmed and produced a few months before the announcement of the Louisville City F.C., the documentary shows the movement and support that proved instrumental in the development and creation of the current professional team. With interviews from founders and members of The Coopers, as well as local business owners and soccer fans, this documentary seeks to portray the high demand for a professional soccer team in the city, and tell the story of a group of dedicated soccer fans working to accomplish their ultimate goal.
The economic burden of mental illness in the United States is substantial. The economic burden attributed to mental illness includes both direct costs, such as hospitalizations or pharmaceuticals as well as indirect costs, such as lower worker productivity. Adult workers suffering from poor mental health may have to take days off work (absenteeism) or may be unable to perform their job to the best of their ability (presenteeism). This study investigates the main factors that contribute to worker absenteeism due to depression, one form of mental illness. Factors such as the rate at which depression is treated, the degree to which there is access to mental health care, economic conditions, socio-economic characteristics, and lifestyle choices are evaluated in order to understand their relationship to lower productivity caused by worker absenteeism.

The leading cause of death for men and women in the United States is heart disease. Concern over the prevalence of cardiovascular disease and the associated costs of treatment has increased, particularly since heart disease is one of the most preventable chronic illnesses. This has led to the development of policies to promote cardiovascular health and encourage additional research. Much of the current research indicates that health disease conditions such as high cholesterol or high blood pressure, a diet high in fat and salt, lifestyle choices such as the use of tobacco and limited physical activity are linked to increased heart disease. Mitigating socioeconomic factors include limited access to health care, low educational attainment, or poverty. This paper examines the most important factors contributing to the prevalence of cardiovascular disease in the United States. The implications of the study are used to form recommendations for health policy.
The baby boomer generation will be the first generation characterized by the ability of most to keep their natural teeth throughout their lifetime. Poor oral health can lead to tooth decay and diseases in the gum, soft tissue, and jaw joints. Insurance coverage for dental care is less common than for medical care. Additionally, dental care is considered as an optional treatment to many people, especially those with low income. This implies that economic variables related to income and fluctuations in those variables should be important determinants of oral health care usage. During an economic downturn, as the unemployment rate increases, people are more likely to cancel or postpone dental care. This paper investigates the impact of economic conditions on dental care usage. Additional factors that may be important in determining the prevalence of dental care such as insurance coverage, access to dental health, socioeconomic characteristics and lifestyle choices are also evaluated.
Food recovery is a unique solution to two problems, food waste and its effects and a large food insecure population. When food is wasted for a number of reasons it is transported to a landfill where it will ultimately take up space and produce methane gas emissions, as well as increase the amount of food produced, increasing the separate effects from production. When the food is recovered it can be used to reduce the food insecure population, which is estimated to be 49 million Americans. Food recovery has a more localized impact, so the Bellarmine Food Recovery Network (BFRN) is more interested in specifically the state of Kentucky, where 17.3 percent of the population is estimated to be food insecure. This is a large amount of the population but when Americans waste between 30 to 50 percent of produced food, amounting to 36 million tons, it can easily help reduce this percentage. BFRN started recovering food from Bellarmine’s University Dining Hall (UDH) in November of 2014. This program was started to help reduce food waste on Bellarmine’s campus and the food insecurity rate in the Louisville area by taking unused food and donating it to local organizations. The program currently works with Volunteers of America and Wayside Christian Mission, who both receive food donations twice a week. From working with these two organizations, it helps increase the availability of food for the local homeless population. As of February 23rd, the program has recovered 1,270lbs. of food. Research will be presented on the impacts of this program on reducing food waste.
POSTER 45

Effects of Stream Channelization and Other Geomorphic Alterations on Nutrient Processing in Ohio River Tributary Ecosystems

Rachel Clemons and Grace Mican / Faculty Sponsor: Dr. Martha Carlson-Mazur

While nutrients such as nitrogen and phosphorus are vital for plant and animal growth, a surplus of these elements stemming from anthropogenic sources in upstream watersheds adversely affects the status of local and large-scale aquatic systems. Nutrients accumulate in smaller streams and travel to larger bodies of water, where nutrient excess can lead to the formation of hypoxic conditions. Ohio River tributary ecosystems, defined as the transition zones where smaller streams flow into the Ohio River, are integral components of their surrounding environments and provide important benefits and services to the human population, such as nutrient uptake and processing. These ecosystems are distinctly located in areas of confluence and experience bidirectional flow from upstream water movement and from Ohio River backflow. Thus, the ecological function and nutrient processing abilities of these streams are affected by stressors derived from both of these hydrologic sources, as well as from alterations in local geomorphology such as stream channel modifications. Withal, it is not fully understood as to what extent geomorphic factors such as stream sinuosity affect the biological activity and nutrient processing capabilities of tributary environments. To reduce nutrient outputs to the Ohio River and to inform restoration efforts for degraded streams, a clearer understanding of stream channelization and its impacts on the natural function of Ohio River tributaries is warranted. With this regard, water chemistry data and geomorphology information were obtained from twelve randomly selected streams from Kentucky and Indiana that flow into the McAlpine Lock of the Ohio River. Preliminary results suggest that more nutrient processing occurs in channels with less modified geomorphology and slower water movement. Restoration of altered landscapes and channelized streams back to their natural conditions may prove beneficial in improving stream water quality and in reducing nutrient output to larger aquatic ecosystems.
Industrial discharges of dissolved metals into Ohio River tributaries and consequential effects on benthic macroinvertebrate communities

Garrett Gabhart / Faculty Sponsor: Dr. Martha L. Carlson Mazur

Water pollution from industrial waste is a serious problem. Discharge of toxic metals is of great concern, as many of the metals have a tendency to bioaccumulate in the food chain, which can cause slower ecological recovery times and a greater ecological threat to higher trophic level organisms. Although some effects of metals have been documented, we know little about the particular impacts of the dissolved metals from coal plant wastewater on the benthic macroinvertebrate community, the insects living on or in the streambed that are indicators of stream degradation. My research identifies impacts of dissolved metals on water quality and benthic macroinvertebrate communities found in tributaries leading into the Ohio River. This was done using a spatial matched pair design that included testing for dissolved metals in water samples at points above and below the sites of discharge. I sampled the macroinvertebrate communities to better understand the effects of pollutants on the stream environment. Statistical analysis of the results were used to sort and decipher the data. This research can contribute greatly to the awareness and understanding about wastewater pollution in our river systems, specifically focusing along the Ohio River in the vicinity of coal-fired power plants.
Urban land use can have a detrimental impact on the water quality within the urban landscape. There are differences in water quality among streams due to conditions like drainage and runoff, especially during storm events. Water quality also changes due to the sediment deposition that runoff creates. The study I wish to do will look at both of these situations at different sites within the Beargrass Creek State Nature Preserve (BCSNP) near Bellarmine’s campus. I will specifically be looking at areas with runoff from culverts as well as the natural spring systems. The methodology I will be using includes water sampling and testing of conductivity, alkalinity, nitrates, pH, turbidity, and temperature. I will also be testing the sediment deposition using sediment plates at each of the sites. Lastly, I will be mapping the stream systems using a GPS locator and GIS technology. I hypothesize that the water quality between the natural springs and the drainage sites will differ not only because of the potential contamination in runoff but also because of the erosion in the runoff. I am hoping that this research, which is in coordination with the land managers at BCSNP, will give insight into fixing these issues and support management efforts.
Throughout the Phanerozoic, preserved reefs demonstrate the relationships between ancient organisms in a way that many other fossil deposits do not. Since reefs or reef-like deposits are preserved throughout the Phanerozoic, it is possible to use these well-preserved structures to study changes in ecological complexity through time.

The purpose of this study is to compare the paleoecologic differences between the Devonian coral beds located at the Falls of the Ohio State Park to reef and reef-like deposits that occur earlier and later in geologic time.

The Falls of the Ohio State Park is world-renowned for its highly-diverse and well-preserved middle Devonian coral. These limestone fossil beds are sometimes considered a coral reef or bioherm, but previous studies are divided on the true biologic association. The Falls of the Ohio State Park is an often visited public site of paleontological importance, but these fossil beds have not been formally studied for several decades, and have never been investigated with modern quantitative paleontological methods.

The stratigraphic unit studied here is the Jeffersonville Limestone and it is conventionally divided into 5 biozones. These are determined based on faunal differences and are known as the Coral Zone, Amphipora Zone, Brevispirifer gregarious Zone, Fenestrate Bryozoan-Brachiopod Zone, and the Paraspirifer acuminatus Zone. This study focuses on the lowest stratigraphic zone, the Coral Zone.

The methodology in this study involved censusing faunal elements using 1m² quadrat sampling along a series of transects in the exposed Coral Zone beds. Mean richness, colony size and associations between organisms were classified at multiple scales (within and among quadrats and transects). These findings were compared to other studies of fossil reef and reef-like associations as well as to modern reefs to determine whether it is accurate to refer to the coral associations at the Falls of the Ohio as a true reef.
Growing crops using alternative agricultural methods, such as hydroponics, could drastically reduce negative environmental effects caused by large-scale traditional agriculture: such as fertilizer and pesticide runoff, soil erosion, and greenhouse gas emissions. Technology like hydroponic systems, makes it realistic to grow plant-based food indoors. Growing indoors would cut out the need for heavy pesticides and reduce the amount runoff from fertilizers because nutrients would be put directly into water taken up by plant roots. The amount of water required to support vegetation would decrease as well, because water would be used in a more efficient way and would no longer be at risk for runoff. The amount of fossil fuels emitted by farming machinery and crop transportation would be drastically reduced, because harvests would be gathered indoors and the food could literally be grown within cities, near the market. Furthermore, the amount of food produced could be increased – if need be – because the prospect of farming in a closed, controlled environment where the temperature and light levels could be controlled means that agricultural production could take place year round.

There are many other potential benefits of indoor farming and gardening that could dramatically improve our agricultural production in this country and reduce environmental hazards seen around the world that are influenced by traditional agriculture. Yet the ideal of farming indoors continues to be fairly unknown amongst the general public and is not a topic of debate either economically or politically. Furthermore, most hydroponics, or other indoor agricultural projects that are being, done are small scale and do not get much attention.

My study will deal with the potential for indoor agriculture (particularly hydroponics and aquaculture) to be used on a large scale for food production; and the implications of a shift to this type of agricultural production.
The Effects of Therapeutic Dance Classes on Cognition, Depression, and Self-Efficacy in People with Parkinson’s

Jasmine Athanasakes / Faculty Sponsor: Dr. Chantal Prewitt

Recently, dance classes have become a part of therapeutic interventions for Parkinson’s disease (PD) due to an influx in research showing that rhythmic dance can slow the decline in functional ability. While there have been many studies published on the effect of structured dance classes on the physical symptoms of PD, there has been little research testing the effects on non-motor symptoms such as cognitive impairment and depression. This investigation will monitor the mental status of patients before and after an 8 week session, as well as individual one-hour classes to determine both immediate and lasting improvements in the patient’s overall mental status.

This investigation is specific to the Parkinson’s dance clinic at Bellarmine called “Let’s Dance!” which meets twice a week. The class is part of the Doctor in Physical Therapy (DPT) service learning curriculum and is available to the public. Before and after the 8-week session the SCOPA-COG (Scales for Outcomes in Parkinson’s disease-Cognition) will be administered to willing participants who will also complete take-home questionnaires before and after the testing period. Both the preliminary and final questionnaires will include a background survey, along with 3 tests: the General Self-Efficacy Scale, the Geriatric Depression Scale, and the Schab and England ADL Scale. Furthermore, various short tests will be pulled from the SCOPA-COG and Montreal Cognitive Assessment before and after individual class periods. The data collected will be analyzed in multiple ways in order to further the understanding of both long and short-term physiotherapeutic interventions for Parkinson’s Disease.
The role of personality on health-related behaviors has received considerable attention in the behavioral and social sciences; however, results regarding this proposed relationship have been equivocal, which may be due, in part, to the reliance on self-report measures of behavioral engagement. The aim of the ADAPT Study is to gain greater insight regarding the relationship between personality factors and various levels and intensities of objectively assessed physical activity among a convenience sample of college students (N_proposed = 200). Higher levels of physical activity will be positively associated with certain personality traits (i.e., openness, conscientiousness, extroversion, and agreeableness) and negatively associated with others (i.e., neuroticism). Participants will be recruited from Bellarmine University and directed to a study-specific web form to indicate interest and submit contact information. Research staff will then schedule an initial lab visit, during which participants will receive an accelerometer and be granted access to a web-based battery of questionnaires. Participants will be asked to wear the accelerometer for seven continuous days in order to obtain a reliable measure of average activity patterns. Upon completion of the 7-day assessment, participants will be instructed to return the monitor to the research team. Following data analysis, participants will receive a personalized feedback form that will detail their levels of physical activity, as well as provide insight regarding their self-reported personality profile, and recommendations for achieving or maintaining an active lifestyle. Understanding the antecedents of physical activity participation provides a critical starting point for designing behavioral programs, as well as identifying individuals who may be in greater need of intervention. The ADAPT Study will be among the first to examine the relationship between objectively assessed physical activity and personality, which will aid in eliminating reporting bias and allow for a more accurate examination of the relationship at hand.
Characterization of Dietary Intake of Ultramarathon Runners and its Association with Performance

Katlin Ferry and Emily Frith / Faculty Sponsors: Dr. Sara Mahoney and Mr. Andrew Carnes

Ultra-marathon runners are an understudied population with unique nutritional requirements. PURPOSE: The purpose of this investigation was to characterize the dietary intake of ultra-marathon runners and to determine the relationship between training diet and 100 mile run performance.

METHODS: Participants (n=19) were registrants of the Mohican 100 Trail Run held in Loudonville, OH. Two weeks prior to the event, participants recorded 3 days of dietary intake representative of their typical diet, and completed training and dietary surveys. Recording was done online using the Automated Self-administered 24-hour recall (ASA24). Official race results were obtained from the race website. Non-paired t-tests were used to compare caloric and macronutrient intake between finishers and non-finishers. Pearson’s correlations were performed to determine if absolute or relative macronutrient intake or caloric intake were associated with finish time.

RESULTS: Male runners (n=15) consumed 386.05±76.7g of carbohydrate (CHO), 136.38±32.3g of protein (PRO), 118.66±37.2g of fat (FAT), and 3121.26±579.2 total kcals per day during training. Females (n=4) consumed 270.52±39.6g CHO, 81.92±22.3g PRO, 97.45±37.6g FAT, and 2221.43±482.1 kcals per day. Overall, participants consumed 49.82±.06% CHO, 16.84±.03% PRO, and 34.17±.06% FAT. Finishers (n=15) consumed significantly more carbohydrates (360.37±86.33, p=0.04) than non-finishers (n=4), but no other differences were found in fat, protein or kcal intake. No significant correlations were found between macronutrient or caloric intake and finish time. CONCLUSIONS: These preliminary results indicate that typical dietary intake of carbohydrates may be a factor in finishing a 100-mile race. However, data from this sample suggest that ultramarathon runners may not consume adequate calories from carbohydrate.
Ultra-marathons, races longer than 26.2 miles, are increasing in popularity in the United States. However, there is a paucity of empirical data regarding the effects of dietary and supplement intake on ultra-endurance performance and associated variables. PURPOSE: This study examined the influence of during event dietary and supplement intake on muscular fatigue and soreness during and following a 100-mile trail race. METHODS: Race diet plans for runners (n=19) were submitted via email 2 weeks prior to the Mohican 100 Trail Run, and were confirmed upon completion of the ultra-marathon. Subjects reported their perceived muscle soreness and fatigue every twenty-five miles, as well as 24 and 48hr post race using a visual analogue scale (VAS) ranging from 0 to 100 millimeters. One way repeated measures ANOVAs were used to compare soreness and fatigue across 25-mile checkpoints. Pearson’s correlations were used to detect associations between event nutrition and soreness and fatigue. RESULTS: During the race, muscle fatigue and soreness increased over time (p < 0.001). Additionally, muscle soreness was significantly elevated from baseline 24h post run (53.57±25.3mm vs. 5.57±9.9mm, p = 0.001), but not 48h post (29.52±23.5mm). Regarding dietary and supplement intake, subjects who consumed more fat during the race reported higher fatigue at 25 miles (r=0.675; p=0.046), and those who consumed higher amounts of caffeine reported increased muscular soreness at 50 miles (r=0.806; p=0.029). Carbohydrate intake and total kcal consumption were not associated with changes in muscle soreness or fatigue during or after the race. CONCLUSIONS: These results suggest that higher fat and caffeine intake may contribute to muscular fatigue and soreness during ultra distance running events. However, additional research is needed to confirm these relationships.
Physical activity is important for individuals with Parkinson’s Disease (PD) to diminish functional limitations and improve quality of life. Physical activity guidelines for those with PD recommend 30 minutes of moderate to intense activity 5 days per week. Individuals with PD rarely meet these guidelines. Examination of physical activity patterns of individuals with PD and their determinants is needed to optimize rehabilitation approaches and help these individuals meet recommended guidelines. To date, no studies have objectively characterized the daily movement patterns of those with PD using tri-axial accelerometry. Furthermore, little is known about the association between objectively measured physical activity and secondary features of individuals with PD. In this study we aim to characterize the daily movement patterns of individuals with PD, examine factors that influence these daily movements, and examine any association between daily movement patterns and various secondary features of PD. To date, 13 subjects have completed the study. Each subject wore an accelerometer for 1 week and completed a questionnaire including demographic information and self-report measures of depression, apathy, social support, activity levels, and self-efficacy. Additional data collected included: modified Hoehn and Yahr staging, Unified PD Rating Scale, 10 meter walk test, Timed Up and Go, mini-BESTest, Five Times Sit to Stand, Six Minute Walk Test, and Montreal Cognitive Assessment. Preliminary analysis indicates that subjects on average spent the following time in minutes/day at these intensities: sedentary (681), light (270), moderate (12), vigorous (3), and very vigorous (0). Subjects spent the vast majority of their time in sedentary activity. Planned analysis includes examination of associations between the physical performance and self-report data with these accelerometry findings. This will reveal potential factors for rehabilitation specialists to address in order to facilitate increased physical activity levels in individuals with PD.
In this study, I will investigate the diplomatic ties between China and the Arab world, specifically how China is executing its ‘peaceful rise’ strategy in the Arab world and how this has made the relationship between China and the Israeli military grow stronger.

Today China is pursuing a unique ‘peaceful rise’ strategy; it has restrained itself from controversial involvement in the Middle East, a decision that has allowed it to quietly extend ties to Israel (largely in the interest of the military) while simultaneously becoming a dominate force in nations such as Saudi Arabia, the United Arab Emirates, and Palestine.

My analysis will begin with a study of historical Chinese-Arab relationships but then it will move towards an in-depth review of contemporary internal and external factors that led to China’s ‘peaceful rise’ strategy in the Middle East. My research on the state of Chinese-Arab relations will rely largely on a combination of research articles, newspaper articles, and declassified government documents. In addition, I will supplement this knowledge with research done during a brief student fellowship I took part in during Winter 2014 to Saudi Arabia.

I hope to find evidence of China’s slow moving, partially timid dealings with becoming a more pronounced international power. Of particular focus is whether this apprehension and restraint is what has proven most useful in China’s developing diplomatic ties in the Middle East.

The significance of this study pertains to the rise of China in global politics, a result of its rapid rise to becoming the largest economy in the world. The United States, China, and the Arab world have an important relationship, and understanding the successful diplomatic measures China has taken could be incremental to the bettering of American foreign policy.
World War I Through the Lens of a Pacifist Soldier: A Critical Interpretation of the Photographs of André Jeunet

Maria Schumacher / Faculty Sponsor: Dr. Eric Roorda

André Jeunet was a pacifist, photographer, and soldier drafted to serve in the French infantry upon the outbreak of the First World War. Beginning when he was only eighteen years old, Jeunet chronicled his experience on both Western and Eastern fronts in a collection of photographs, journal entries, and personal letters. Jeunet’s photographs are rich with a variety of subjects and reoccurring themes such as civilian life on both fronts, children at work and play, architecture, natural landscapes, both the mundane and perilous moments of military life, battlefields, trenches, and several self-portraits which grow darker with each passing year. Following World War II, Jeunet’s daughter Cécile married American soldier Richard Spalding and moved to his native Louisville. Her father soon followed, and remained in Louisville for two decades working as an architect before his death in 1979. In the last decade, Ms. Spalding donated 2 10 of her father’s photographs and a small collection of translated journal entries and letters to the University of Louisville. With my research I seek to interpret and carefully place André Jeunet’s work and worldview in the wider context of the First World War.

Go Baby Go!: A Markov Chain Approach to Horse Racing

Abby Fowler / Faculty Sponsor: Dr. Susan White

Horse racing is known to be the “fastest two minutes in sports.” For such a quick event, much analytics and speculation goes into a horse race. Handicapping refers to the practice of predicting the winner of a horse race. Statistical analytics and probabilistic models are often used by handicappers to best predict a winner of a race. Some handicappers look at a horse’s Beyer’s Speed Figure, which is a rating for the horse’s speed performance on a given track. This research uses Markov Chains to predict a horse’s speed figure. In a Markov Chain, the probability that an event occurs depends only on the previous event. A Markov Chain in this research predicts a horse’s speed figure for a specific race, given that the horse received a certain speed figure for the previous race. The Markov Chain is analyzed for any long-term behavior of a horse’s speed rating.
The Rationality in March Madness

Adam Hardy / Faculty Sponsor: Dr. Anne Raymond

Every year in March, the NCAA tournament puts the college basketball world into a frenzy. With wild finishes at the buzzer and Cinderellas making their run through the tournament each year, the NCAA bracket is one of the most challenging outcomes to predict. There are many ways to fill out an NCAA tournament bracket. From picking one’s favorite mascots to researching experts’ opinions, bracketology can be simple, or it can go into much more detail. Recently, as more and more interest rises in the NCAA tournament, many experts have turned to predicting outcomes using their own probability models to construct their brackets. This research analyzes different ways to predict the most accurate and consistent outcomes when filling out a bracket. It examines the most successful probability models that are currently in place, and it attempts to find the strengths and weaknesses of each model. The research also takes into account the methodology of choosing upsets based on the work of Peter Tiernan. Although the probability of filling out a perfect bracket is slim, this research increases the chance of having the most accurate and consistent bracket from year-to-year.

Solving The Rubik’s Cube: “What’s It Got To Do With Math?”

Jacob Marburger / Faculty Sponsor: Dr. Anne Raymond

The Rubik’s Cube is a colorful puzzle that, although its glory days may have past, is a concrete representation of a group. The means by which one might learn to solve a Rubik’s Cube are readily accessible online or in books as a group of algorithms useful in achieving a specific permutation of the Cube from another permutation. This research argues that knowing the formal notions of group theory and permutation groups enhances one’s ability to learn to solve the Cube. There is a definitive counter-logic to this claim, as proficient Cubers do not speak of mental calculations during the act. This research demonstrates the effectiveness of the popular algorithms in achieving specific and purposeful changes in a Cube. Permutation groups are shown to be useful in creating ad hoc algorithms and predicting their effects in other cases. The motivation for these exercises is to establish the significance of algebra in problem solving in one setting where the use of the mathematical jargon is not the norm. The utility of abstract mathematics in this context is gauged by the ease with which problems can be solved by thinking mathematically instead of by rote memorization and trial and error.
The Statistics of NCAA Track and Field Conversions

Flannery Musk / Faculty Sponsors: Dr. Anne Raymond and Dr. Susan White

The National Collegiate Athletic Association (NCAA) is an organization committed to creating fair competition for all its associated student-athletes across the country. In track and field, one such aspect of fairness is the location where an event takes place. Depending on the institution hosting the track and field competition, there are many variations that can impact the results of a running event. These variations can extend from the type of track the institution houses to the altitude of the institution itself. In seeking to promote fairness in competition, the NCAA has created standards by which all running events are converted, making these events an equal and fair representation of the abilities of the athletes competing. These conversion standards seek to eliminate any benefit gained by running at various locations. Keeping the goal of fairness in mind, this research analyzes the accuracy of these conversion standards used across the nation to rank track and field athletes. This research presents suggestions for further development of these conversion standards.

Defensive Tactics in the Game of Liar’s Dice

Sean Spitza / Faculty Sponsor: Dr. Michael Ackerman

This research takes a look at the game of Common Hand Liar’s Dice, a popular dice game in both the casual and competitive gambling field. The game typical consists of two or more players, each starting with five 6-sided dice. Using cups as concealment, each player can view what only they had rolled and place bets on how many of each die result was rolled across the entire group of players. What makes the game interesting is the fact that players can lie about their bet to throw off future bets. Betting continues until someone calls a bluff on someone’s bet to determine if the bet was true or false. If the bet was true, the player that called a bluff loses one die. If the bet was false, the better loses one die. The game continues until only one player has dice still remaining. Since the game has thousands of various outcomes and strategies based upon the number of players in the game, this research only views a couple of different scenarios. By viewing the probabilities of each outcome to possibly occur, this paper shows the moves that a typical player needs to avoid when the opponent has the upper hand. This paper also takes a look at a typical four player game in which all players have only one die left, and determines the best possible strategy for attempting to survive another round of betting.
A Real Time, Stochastic Approach to Malware Analysis

Benjamin Turi / Faculty Sponsor: Dr. Susan White

In today’s modern world, malware is a persistent, dangerous threat to any computer system and in turn, any company, business, government and individual worldwide. The computer anti-virus industry spends billions a year trying to defeat this ever growing threat. The biggest problem in facing this threat is the fact that it is dynamic - ever changing. Currently, the primary anti-malware system leverages signatures to find malware. This static approach to a dynamic problem has proven to be less and less effective. In this paper, I propose a new approach to the malware problem; Instead of statically trying to determine whether a particular program is malware, this research proposes leveraging Markov Chains to perform real-time dynamic threat analysis. By getting down to the assembly code and classifying the instructions, one can use the Markov chain to follow the program flow and get a better idea whether the program is malicious. This technique of active classification proves to be a much better approach than signatures at identifying malware. By implementing this approach on a network and/or individual computers, this has broad implications to network security that could help put the advantage back into the hands of network administration when it comes to computer security.

Medication Interference with Clinical Laboratory Analysis

Erin Crismore / Faculty Sponsor: Dr. Karen Golemboski

Amphotericin B is a commonly used antifungal medication that in free form can be toxic to the kidneys. This is particularly an issue for patients receiving chemotherapy, who are at high risk for fungal infection. Liposomal administration of medication is considered to be a much safer alternative in cases of potentially toxic medication. Liposomes are small lipid capsules that can carry and deliver medication specifically to the sites of damage. Some liposomal medication, including liposomal Amphotericin B (L-AMB), can cause assay interference. In particular, L-AMB can falsely elevate inorganic phosphorous levels when measured using spectrophotometric methods. In this case study, a 46 year old Caucasian female bone marrow transplant patient presented with a systemic Candida krusei infection. The patient was subsequently treated with high levels of AmBisome (L-AMB). Though it was known that AmBisome can cause falsely elevated phosphate levels, the aggressive antifungal treatment caused such an elevation that medication was prescribed to lower the patient’s phosphate levels. Consultation with the laboratory led to discontinuation of treatment before phosphate levels dropped low enough to cause major consequences such as muscular and neurological dysfunction. This case shows the how cooperation between physicians and laboratory professionals can lead to better patient outcomes.
Somatic Calreticulin Mutation in a Case of Essential Thrombocythemia
Paula Logsdon / Faculty Sponsor: Dr. Karen Golemboski

Essential thrombocythemia (ET) is a rare myeloproliferative disorder characterized by the overproduction of platelets. ET is a result of somatic (acquired) mutation in progenitor cells in the bone marrow. The mutations responsible for ET result in clonal proliferation of progenitors and consequent overproduction of platelet-producing megakaryocytes. This case describes a female patient diagnosed with ET at a relatively young age of 42. Genetic analysis revealed a normal Janus kinase 2 (JAK2) gene, which is mutated in about half of all ET cases. The patient was identified as having a somatic mutation in the calreticulin (CALR) gene, which is a less frequent cause of ET than JAK2 mutation. This mutational analysis testing is important because patients with CALR mutation have a lower risk of thrombosis and longer overall survival than patients with mutated JAK2. ET patients with CALR mutation also have significantly higher platelet counts, higher hemoglobin levels, and higher leukocyte counts than patients with JAK2 mutation.

Environmental Infection of a Class A Bioterror Agent
Ashley Thomas / Faculty Sponsor: Dr. Karen Golemboski

Class A bioterrorism agents include any high priority pathogens that pose a risk to national security. Most of these agents occur naturally with a low incidence of infection. To be categorized as class A the organism must be easily disseminated, result in high mortality rates, have major potential to impact public health, and require special actions for public health members to be prepared. Commonly known class A bioterrorism agents include Bacillus anthracis (anthrax) and Yersinia pestis (bubonic plague). Among these class A agents is Francisella tularensis, a pathogenic bacterium that can be found in many arthropods such as wood ticks, dog ticks, lone star ticks and deer flies. Although this bacterium may also be present in rodents and rabbits, ticks are the most common route of infection. Infection caused by Francisella tularensis is referred to as tularemia, or colloquially as rabbit fever. This case study represents an 87 year old female with previously known heart problems who was brought to the emergency room complaining of dizziness and a syncopal episode. After further examination with accompanying laboratory data, it was determined the illness was caused by an environmental infection of Francisella tularensis. The colonization occurred from a small finger abrasion from trimming the hedges one week prior to the emergency room visit. Cases of Tularemia generally present with fever, lethargy, enlargement of lymph nodes and signs of sepsis. This particular case is unusual because the patient did not present with many of these clinical symptoms associated with tularemia. Signs of sepsis, a vast immune response causing widespread inflammation, were later noted including decreased urine output and platelet count, change in mental status and abnormal cardiac function.
Timely transfers between units have a great impact upon patient outcomes. As a result, breaking down barriers to transfer times is a high priority. This project investigates the nursing specific barriers to timely transfers at the Veterans Affairs Memorial Hospital in Louisville, Kentucky. After identifying common barriers in literature and through a qualitative review of nursing blogs, a questionnaire was created to assess the impact of potential unit level nursing specific barriers. The questionnaire consisted of the top ten identified barriers. Registered nurses were asked to rate the impact of each barrier on a five point scale from “no impact” to “greatly impacts.” Two qualitative questions were also included. One hundred percent of the nurses on five units participated, n = 26. Additionally, actual transfer times from inpatient records were reviewed. An average transfer time for each unit was calculated. This data was used in collaboration with the results of the questionnaire to guide analysis. Questionnaire responses from the units with longest and shortest transfer times were compared using t-tests. For those units, the only item found to be statistically significant was the impact of communication between units on timely transfer, p = 0.0190. When the results of the unit with the longest time was compared to the results of the hospital overall, time of day was found to statistically significant, p = 0.0282. These findings were confirmed in examination of qualitative responses. Based on the results, a plan for teamwork and communication training was presented to the hospital. Areas identified for further examination include: role of the patient flow coordinator and the unit charge nurse, staffing availability (RN and ancillary staff), collaboration and communication between units, handoff/report procedures, and teamwork between disciplines.
Tap Blocks as Pain Control in Post-Operative Mastectomy Patients

Brianna Sheahan and Andrea Walker / Faculty Sponsor: Mrs. Beverley Bone

This study began as a focused comparison of pain control measures used for post-operative mastectomy patients. There are many side effects that come with oral and intravenous opioid consumption. To decrease the likelihood of these side effects and improve pain control overall, a peripheral nerve block (tap block) may be used. The initial hypothesis was that tap blocks would have more effective pain control than oral and intravenous pain medications. However, once inconsistencies in retrospective data collection were discovered, the focus was shifted. Emphasis was then placed on designing an improved charting process for staff nurses so that better data collection could be practiced and significant statistics would be available for analysis. Ultimately a tool was proposed for standardization of pain scores between patients. This was offered in conjunction with a program of education and data gathering as a solution to the initial research design. The initial segment of the project was carried out by two Accelerated BSN students. The next leg of research will be completed by nurse residents at the University of Louisville Hospital.
The STEM Scholars Program and the Eureka Learning Community at Bellarmine University

Michael Bowden, Amber Byrum, Jackson Sherman, and Benjamin Flint / Faculty Sponsor: Dr. Akhtar Mahmood

At Bellarmine University, using funding from NSF’s S-STEM program, we have established a STEM Scholars Program and a Learning Community (called the Eureka Learning Community) for the undergraduate STEM students. The NSF S-STEM grant is providing twenty scholarships for four years (which are both merit and need based) to undergraduate students majoring in Physics, Chemistry, Mathematics, Computer Science, and Computer Engineering. Over 60% of the scholarship recipients are from the underrepresented groups (minority or women or first-generation students). To improve retention and enhance the STEM learning opportunities, in their first two years, all the Eureka Learning Community students who are freshmen and sophomores take a specific set of General Education and Math classes together and receive peer-tutoring from the junior and the senior STEM students. They all live in the same residence hall on campus, in a designated floor and take part in informal out-of-class science/outreach and community-building activities that are organized by the Eureka Learning Community. All STEM scholars are also required to take part in faculty-mentored research projects in their respective major starting in their sophomore year. As a result of the NSF S-STEM scholarships and the Eureka Learning Community, the STEM undergraduate enrollment in these targeted STEM majors have now doubled at Bellarmine University.
**Poster 69**

**Mass Predictions of Charmed and Beauty Baryons Using the Quark-Gluon Mass-Energy Relationship**

Benjamin Flint and Amber Byrum / Faculty Sponsor: Dr. Akhtar Mahmood

At Bellarmine University we have developed a Baryon Mass Model using the quark-gluon mass-energy relationship to predict the masses of the undiscovered double and triple Charmed and the Beauty Baryons. We will present the predicted masses of the six double and one triple Charmed Baryons and the thirty-five ground-state Beauty Baryons with $J^p$ of $1/2^+$ and $3/2^+$. Charmed and Beauty Baryons for a very short times populated the early universe during the hadron era, less than a microsecond after the Big Bang. Baryon spectroscopy containing charmed and beauty quarks are very important for understanding the dynamics of quark and the strong force via gluon interactions in the early universe.

**Poster 70**

**Hands-on Robotics Lab at Bellarmine University**

Benjamin Flint, Tyler Martinez, Jackson Sherman, Michael Bowden, Amber Byrum, and Jorden Matty / Faculty Sponsors: Dr. Akhtar Mahmood and Mr. Stephen Brown

We have setup and implemented a new hands-on Robotics Lab at Bellarmine University. Although the Robotics Lab is primarily intended for our physics majors, the lab is also available to any student who is interested in using robotics, micro-controllers, remote sensors and imaging in their research projects. In the Robotics Lab, students can conduct inquiry-based activities with various types of robotic devices and can carry out hands-on labs based on microcontrollers, motors, and remote sensors. Students can also build their own robotic devices and platforms and then write the motion code using Python. We will demonstrate some of the robotics projects (including a 3D printer) we are currently working on in our Robotics Lab.
More and more women are completing post-secondary education programs, including a substantial portion of females who are mothers in addition to their roles as students (Wilsey, 2013). While the causes and correlates of teenage pregnancy have been given much attention, considerably less research has been conducted on the impacts of motherhood, especially among college students. Based on a criterion sample, young mothers currently pursuing a college or university degree in a Midwestern metropolitan area will be recruited for this study to examine the perceived impacts of raising a child/children from the perspective of ‘student mothers’ utilizing a mixed-method approach. The focus will be set on investigating the association between socio-economic status (parental/personal) and coping self-efficacy skills with a comparison of the participant’s subjective experiences before and after the birth of their first child. The participants will respond to a 28-item questionnaire and subsequently will be invited to participate in semi-structured follow-up interviews modeled after the exploratory case study method (Creswell, 2013). The aim of this qualitative component is to put special focus on the participants’ perspective on changes in their life situation due to being a parent, complementing the quantitative data collected through the questionnaire and informing its interpretation.
Procrastination from social media as it relates to gender, year in school, and personality type

Jade Bevarly / Faculty Sponsor: Dr. Christy Wolfe

With technology becoming more advanced and more readily available, the options of how to spend our free time are endless. In the year 2015, time has never been easier to pass. With just the click of a remote bringing up Netflix, or the click of a mouse bringing up Facebook, Tumblr, Twitter, and more, hours upon hours of time will be spent before you know it. Smartphones make this even easier as you can now peruse any of the above on the go on their app form. However, with all this social media at our fingertips, not only is free time easier to achieve, but procrastination is as well as consequence. Previous studies have examined correlations between procrastination and academic success (Cerino, 2014) and procrastination and ADHD (Niermann & Scheres, 2014), but could procrastination be associated with something less complex as well? The purpose of this study is to address the question: How is social media use today associated with procrastination? More specifically, is there an association between procrastination and social media use, and is this association moderated by gender, year in school, or personality type? The participants will be taken from the student population at a small, Midwestern university. They will then be asked to complete a questionnaire about their personal social media use, a personality scale survey, and a procrastination scale survey. It is hypothesized that social media use will have a positive correlation with procrastination. Three additional outcomes are expected, namely males will procrastinate more than females, seniors will procrastinate more than underclassmen, and extroverts will procrastinate more than introverts. The moderating roles of these variables on the procrastination-social media use association will be explored.
Over the past decade there has been a globally increasing interest in the term “Quality of Life” or QOL. The Organization for Economic Co-operation and Development (OECD) is an organization whose mission is to promote policies that will improve the economic and social well-being of people around the world. The main goal of the OECD is to quantitatively measure quality of life in countries all over the world. This current project will take the 11 topics that the OECD uses to assess quality of life around the world and will apply them specifically to students’ quality of life (real and ideal) at Bellarmine University in Louisville, Kentucky. The 11 topics being assessed are community, education, environment, civic engagement, health, housing, income, jobs, life satisfaction, safety and work-life balance. These 11 topics comprehensively measure ones physical, psychological and social well-being. Students who complete the survey will be asked to rate how important, on a scale of 1-10, they believe each of the topics is to living a life of quality (ideal). Students will then be asked to rate each topic based on the current perceived quality of their own life (real). Students will then complete a series of demographic questions for categorization purposes (e.g., commuter, athlete, gender) – and eventual comparison between categories. This identifying information will explore whether or not there is a difference among students quality of life depending on their personal situation. All students at any university should have the same opportunity to live equivalent lives of quality so there are equal opportunities for success. This study will explore the similarities and differences.
What's Your "Selfie-steem"?

Molly Downing / Faculty Sponsor: Dr. Christy Wolfe

With nearly 74.4% of American households having access to the internet and over half of those with internet being involved with social networking, websites like Facebook, Twitter, and Instagram, they are not only increasing in popularity, but they are also becoming the norm (census). Online interactions have begun replacing face-to-face interactions and people are frequently comparing their reality to the glamorized (and sometimes unrealistic) lives portrayed on profiles or in posts. Users seeing this unfair social comparison may have important implications for developing an individual’s self-esteem and body image satisfaction; thus, it is important to investigate how these online portrayals may be related to self-esteem. This study will focus on an increasingly popular phenomenon known as “selfies,” which are defined by the Merriam-Webster dictionary as “image[s] of oneself taken by oneself using a digital camera especially for posting on social networks.” The purpose is to look at the correlation between “selfie-takers” and self-esteem levels in teens through young adults (age 18-25). The purpose is to find if there is a correlation between those who take “selfies” and self-esteem. 50 participants will be asked to complete an online adaptation of the Rosenberg self-esteem scale, as well as answer 6 brief questions in relation to their Instagram use and "selfie" taking habits. It is hypothesized that those who take more selfies will also have lower levels of self-esteem.
Research on the extent of parental influences on the healthy eating and exercise habits of individuals is often limited to youth participants (Pacheco et al, 2012). Few studies reach out to collegiate students to study the lasting impact a healthy family environment can have on children. The purpose of this research project is to determine the impact of family environment, specifically the healthy eating habits and exercise habits of the parents, as a motivational factor for students choosing to major in Exercise Science. Exercise Science is a major that is arguably focused on health and well-being. The correlational study will include Bellarmine University students majoring in Exercise Science and various other majors. The subjects will be given a one page questionnaire that will be used to assess their healthy eating and exercise habits and the habits of their mother and father. The research question is do healthy eating and exercise habits of the parents influence a student’s healthy habits, and further, are “healthier” students more likely to major in a health related field, such as Exercise Science.
Current rates of meat consumption are climbing at an unsustainable rate that threatens health, animal welfare, and the environment (Food and Agricultural Organization of the United Nations, 2009; Pew Commission on Industrial Farm Animal Production, 2008). Additionally, research has linked meat consumption with cancer, heart disease, and diabetes (Harvard Health Publications, 2012; Johns Hopkins Bloomberg School of Public Health, 2015). In spite of increased awareness surrounding these issues, meat eaters are faced with growing pressure to rationalize their behavior, and they have been shown to experience cognitive dissonance when faced with vegetarians (Rothgerber, 2012). Organizations that seek to reduce meat consumption and promote awareness about animal cruelty have done some modest research on the effectiveness of different leafleting strategies, but these have all had some significant flaws with regards to design (Animal Charity Evaluators, 2015a, 2015b; Humane League Labs, 2014). Furthermore, there is sparse research on the persuasiveness of pamphlets that argue for the reduction or elimination of meat consumption. This research will shed some light on which persuasive techniques are most convincing, and it could potentially help other organizations utilize the most effective approach for getting people to reduce their consumption of meat. Participants will receive one of six pamphlets that promote either the reduction or elimination of meat consumption from an environmental, health, or animal welfare approach. We will then measure their future intentions regarding meat consumption, how persuasive they found the arguments, and perform a manipulation check to ensure that participants read the material. It is hypothesized that participants who report eating less meat are more likely to find the ethical arguments most convincing and more likely to report that they intend to decrease meat consumption. It is also hypothesized that participants will find the pamphlet regarding the reduction of meat consumption for health reasons most convincing.
From pulling all-nighters to practically living in the library, students at colleges and universities around the United States strive for their best overall academic performance. But instead of pulling all-nighters, students should understand how they learn best to obtain optimal performance. Past research has suggested that teachers should not just expect students to retain the information given to them, and teachers should not expect students to learn material all on their own. Instead, students should receive a teacher-student interaction to be able to fully comprehend what they are learning in the classroom (Ganyaupfu, 2013). As human beings, our minds are complex. By receiving the teacher-student interaction, students optimize their performance by both listening and performing to retain information. Participants will be students from a small, private mid-western university ranging in student status from freshman to senior. Participants will complete a questionnaire pertaining to their experiences with different professors in a required general education course sequence at the University. The questionnaire will assess the students’ perceptions of the teaching method of the teacher (teacher-centered method, student-centered method, or teacher-student interactive method) and compare this perceived teaching method with the students’ overall grade in the course to determine if there is a relationship between the two factors. It is hypothesized that the teacher-student interactive method will be related with the highest student performance. The results of this study may have implications for preferred teaching, and even leadership strategies.
Psychological disorders affect many individuals at the academic, work, and interpersonal levels of functioning. Without treatment, they have the potential to directly impact one’s personal success. One of the most common neuropsychiatric disorders, Attention-deficit/hyperactivity disorder (ADHD) is characterized by problems with inattention, hyperactivity, and impulsivity and has been expressed differently among gender (Skogli, Teicher, Anderson, & Hovik, 2013). Because of this, ADHD is consistently underidentified and underdiagnosed primarily in females (Gaub & Carlson, 1997; Quinn, 2008; Biederman, Mick, Faraone, Braaten, Doyle, Spencer, Wilens, Frazier, & Johnson, 2002). Because much of attention disorders is characterized by distractions in regards to hyperactivity, it would be beneficial for clinical purposes to investigate possible associations between physical and mental hyperactive distractions, gender, and personality. In this study, participants will be recruited from Bellarmine University and are invited to complete a three-part questionnaire. The questionnaire will assess demographic information and participants' responses to their individual ratings in the categories of extraversion, introversion, mental hyperactivity, and physical hyperactivity. It is hypothesized that females and those that score highly introverted will demonstrate greater correlations of mental hyperactivity, whereas males and those that score highly extraverted will demonstrate greater correlations of physical hyperactivity.
The Nerve: Effects of Parenting Style on Coping with Stress

Lauren McGrew / Faculty Sponsor: Dr. Christy Wolfe

Throughout a lifetime, women are twice as likely as men to develop an anxiety disorder. Several factors – biological, psychological, and social/environmental – are involved in the mechanisms of anxiety. The present research study was designed with particular interest in social and environmental factors and how these factors affect anxiety in women. Previous studies suggest that anxious tendencies in parents can be transferred to their children (Ballash, Leyfer, Buckley, & Woodruff-Borden, 2006). Studies have also identified three main parenting styles – authoritarian, authoritative, and permissive – which may also play a role in a child’s emotional state. This pilot study explores the association between current feelings of stress and how these relate to retrospective perceptions of parenting style of each parent. Participants will be undergraduate students from Bellarmine University. Each participant will be given a shortened version of the Coping with Stress Inventory (COPE; Carver, 1997), which asks them to rate how well they have been coping with recent stresses in their lives, and the Parental Authority Questionnaire (Buri, 1991), which assesses the individual’s perception of their parents’ parenting style as they were growing up. It is hypothesized that participants who score high in the categories of “denial” and “self-blame” on the COPE will be positively correlated with perceiving their parents as authoritative, thus the participants’ level of anxiety will be higher. A gender difference is expected to be present among these findings.
Past studies have demonstrated a link between personality and music. For example, research has investigated the ability of music to elicit emotion in individuals (Ali & Peynirciolu, 2010; Bennett, 1942; Kreutz, Ott, Teichmann, Osawa & Vaitl 2008; Harlow, 1983; Madell, 1996; Schwartz, 1985). Further, music has been used to influence and elicit various psychological processes including emotional processing and momentary attentional and concentration processes.

Other studies have shown that overall personality type can play a role in the purpose and frequency with which individuals listen to music (Georgi & Polat, 2013; Rentfrow, Goldberg, & Levitin, 2011; Luck, Saarikallio, Burger, Thompson, & Toivainen, 2014). Personality type also seems to play a role in how people use music in their everyday lives—higher IQ individuals tended to use music in a rational way while more neurotic individuals tended to use music to change or enhance moods (Chamorro-Premuzic & Furnham, 2007). Individuals with high emotion tend to use music more intensively to influence previously existing emotional states and situational affects (Georgi & Polat, 2013). While many studies have looked at the role of personality in how individuals listen to music, few studies have looked into a correlation between personality type and music preference in terms of genre. The purpose of this study is to assess whether preference for certain music genres has any correlation to an aspect of personality—specifically, zest and enthusiasm—as listed in Peterson and Seligman’s (2004) 24 Revised IPIP-VIA Scales. An operational definition of music preference will be obtained through Rentfrow and Gosling’s Short Test of Music Preferences (STOMP) (2003). The data from both of these measures will be subjected to a correlational analysis in search of any associations between zest and enthusiasm and a preference in music genre for participants.
POSTER 81

Parenting Style and Daughters' Adherence to Gender Roles

Heaven Perry / Faculty Sponsor: Dr. Christy Wolfe

The understanding that gender is a flexible, non-binary concept is by no means a profound discovery. People are far too abstract for such a central portion of their identity to be rated on a single sliding scale. However, although there is no solitary catalyst responsible for determining how feminine, masculine, or androgynous an individual may be, the impact that parents have upon the development of their children is vast. The relationship a child has with his or her parents communicates the extent to which they may be allowed to experiment with any number of roles—including gender-based deviations (Beyers & Goossens, 2008). The purpose of this study is to examine the relationship between women’s adherence to gender roles, as measured by the Bem Sex Role Inventory (BSRI), and the perceived parenting styles of their mothers and fathers. Participants will include women currently enrolled in Bellarmine University as students. Each participant will be asked to complete the BSRI and two additional questionnaires that utilize reflective scenarios to determine the perceived parenting styles (authoritative, authoritarian, or permissive) of her mother and father while she was growing up. It is hypothesized that perceived authoritarian parenting styles will positively correlate with adherence to feminine gender roles.

POSTER 82

The Effects of Parenting Styles on Body Appreciation and Healthy Eating Habits

Margaret Riddick / Faculty Sponsor: Dr. Christy Wolfe

Parenting styles is a widely studied topic throughout the research field (Baumrind, 1967). Research consistently shows that parenting styles have a profound effect on children. For example, authoritative parenting style is positively associated with higher personal standards and organization, and negatively associated with feelings of being criticized, concerns about making mistakes, and doubts about abilities. Additionally, body image and healthy eating habits are two important topics in the field with significant implications for overall health and well-being (e.g., Schilder, 1950). Distorted body image and unhealthy eating habits continue to be linked to depressive symptoms among adolescents and early adults (Blashill, 2014). The present study aims to see if there is an association between certain parenting styles, and one’s body satisfaction and healthy eating habits. Gaining a better understanding of the relationship between parenting, body image and health will allow us to develop better insight into strategies for increasing health and body satisfaction among students. The purpose of this research is to determine if perceived parenting styles are associated with college student’s body appreciation and healthy eating habits. This study aims to have at least 30 (N=30) college students from Bellarmine University participate in the study. The participants will be given a consent form and three surveys: the Parenting Style survey, the Body Appreciation survey and the Good eating habits survey. Statistical analysis will be performed on the data. Participant responses to the survey questions will be kept completely confidential.
Past research suggests that extroversion has a positive association with self-serving bias (a psychological strategy used to protect self-esteem). That is, people who score high in extraversion tend to take credit for personal success but to deny responsibility for personal failure (Stanger et al., 2014). The findings of this study imply that those with certain personality types may be predisposed to developing depression due to their moderate to weak strength of self-serving bias. Therefore, the current study will examine if differing levels of self-esteem arguably due to personality type are associated with one’s perception of reality, or depressive realism, and then how their behavior may be influenced by this perception. This question will be addressed by recreating the aforementioned correlational study (i.e., Stanger et al., 2014) consisting of a Big Five Personality Trait questionnaire, a Self-Serving Bias construct scale, a Prosocial Tendencies Measure (PTM; Carlo & Randall, 2002), and the Multidimensional Students’ Life Satisfaction Scale (MSLSS; Heubner, 2001). It is expected that at least 40 typical college age students, ranging from 18-27, from Bellarmine University will complete the survey. Participants will complete the surveys individually in a classroom setting and will be given ample time and resources, such as pencils and pens, to complete them. Upon arrival at the testing site, the participant will be asked to write their name and email on a sign-in sheet and will be debriefed by the primary investigator regarding the purpose of the survey within the cover letter and given an additional opportunity to consent to participate in the study. Once the survey is completed, the participants will be asked to hand them into the primary investigator and they will be given the opportunity to take candy. After data collection, a series of correlational analyses will be implemented to address the study’s research question.
Art Therapy has been used in hospital settings all around the world to decrease the anxiety of patients. Art therapy is defined as a form of psychotherapy involving the encouragement of free self-expression through painting, drawing, or modeling, used as a remedial activity or an aid to diagnosis (Merriam Webster, 2014). In previous studies it has been shown that using art in inpatient settings has a number of benefits that range from, physiological, mental, and community group health (Crone, O’Connell, Tyson, Clark-Stone, Opher, & James, 2013). The overall research question of the current study asks if art therapy is an effective tool when trying to lower the anxiety levels of college students? Thus, the purpose of this study is to examine the effect an art experience has on one’s level of stress or state-anxiety. There will be three conditions in this experiment: one control condition and two experimental conditions. In the two experimental conditions, participants will partake in a small art project (either drawing or sculpting) for 10 minutes. The reasoning behind using two different forms of art is to see if there is a difference in the decreasing stress levels. I am hypothesizing that the sculpting will produce a greater benefit because of the malleable material. In the control condition, participants will only be asked to fill out the anxiety survey. There will be approximately 60 people in the study recruited from a small, private Midwestern university. Each group will complete a two part anxiety/stress survey, which will help determine how stressed they are. It is hypothesized that the experience of participating in an art project will result in lower stress and state anxiety scores for the participants. Results of this study may have implications for college students and provide more information for the valuable process of stress reduction.
It has become increasingly recognized that sleep is important for every day functioning. It is crucial for things such as healthy brain function and emotional well-being, physical health, as well as daytime performance and safety (NIH). However, there is a difference between getting sleep and getting enough sleep or quality sleep. It is advised that adults get between 7-8 hours of sleep a night (NIH). Studies of college students have found, though, that most college students indicate being “chronically sleep deprived” (Bailey et al., 2014). In fact, studies have found that 75% of students report being “dragged out, tired, or sleepy” and 60% of college students report poor sleep quality (Bailey et al., 2014). It has been noted, too, that women sleep differently and report differently about sleep disturbances than men (Röösli et al., 2014). Thus, this study will look at different factors, such as sleeping preferences and habits, compared to overall quality of sleep among males and females. Participants will be students of any age or major at Bellarmine University. Each participant will be given a 28 question survey that asks questions regarding sleep. Participant responses will be analyzed to see if a significant relationship exists between sleeping preferences and habits in comparison to quality of sleep, as well as if there is a difference in the quality of sleep between male and female college students.
This project aims to educate and mentor young women in the Louisville community to become leaders. There are very few women in leadership and government positions and this makes it difficult to inspire young girls to try for these types of occupations when they get older. Therefore, in collaboration with Girls Scouts, we plan to host an all-day event at Bellarmine University. We are also contacting women in the community who have a part in leadership or government/business positions to participate.

This event has the following objectives: 1) to show girls that there are women who have pushed for their dreams and made it to where they are today, and that it is possible for the girls to do the same and pursue large goals, 2) to educate the girls on important policies and skills to have to be aware of in government occupations in order to complete badge work requirements, and 3) to have women in the community be mentors for the girls throughout the event and throughout the rest of the year.

This project is systemic through the way we have organized the event to be carried out and who we contacted. It is also sustainable in that we hope to have this event become an annual for Girl Scouts, and then more girls can participate in leadership and maybe pursue careers in these fields. One type of evidence our group would like to do is a survey/questionnaire at the end of the event to get a feel for whether the girls and speakers liked what they experienced, and if they would do it again if given the option. Overall, the change we are striving towards is to have more women in leadership one day by inspiring young women to get involved in government and businesses.
Leadership in Healthcare

Allyson Mattingly / Faculty Sponsor: Dr. Kathryn West

Women have historically held fewer leadership positions than men. The earliest empires and civilizations were run predominately by men and it wasn’t until the 20th century that we began to see women step up in organizations to take the lead. Healthcare is an industry with a majority female workforce, as well as a greater number of female consumers than male. However, while the workforce is made up of 74% females, the top leadership positions within hospitals and other healthcare administrations are held mostly by men. A 2011 study found that only 25% of CEO positions in healthcare are held by women (Fontenot). The goal of this project is to inform the audience of the history, the current status, and the future projections for women in healthcare leadership in the United States. This project will then offer an assessment on the lack of female leadership on the quality and type of care received by female healthcare consumers.

Here's Why We Majored in English . . .

Emily Cecconi, Hannah Justice, David Rohlmann, and Margaret Senn / Faculty Sponsor: Dr. Kathryn West

This table will display capstone projects from the senior English majors. Some students will present audio/video work; others will take more of a written format. We are working to offer an engaging look at the work done in our discipline, which is most often presented in a written article or a formal paper presentation. Projects cover such topics as connections between THE LORD OF THE RINGS trilogy and World War II, influential female characters and their characteristics, and storytelling modes in the graphic novel.
Art, Architecture, and Music of Michael Ondaajte's THE ENGLISH PATIENT

Sarah DeGeorge, Jillian Nethery, and Jacob Frederick / Faculty Sponsor: Dr. Kathryn West

Michael Ondaajte's Booker Prize-winning novel THE ENGLISH PATIENT tells its story through a series of tableaux, scenes of four characters residing in an abandoned villa at the end of World War II, talking with each other and remembering their pasts. The novel also gets its story told through a marked use of intertextuality, with art, architecture, sculpture, music weaving in and out of the story. This presentation offers a guide through the art and music of THE ENGLISH PATIENT, so that readers can better appreciate the nuances and the depths of the character's and their lives, as well as of the zeitgeist in Italy--and the world--in 1945.

Here's Why We Majored in English . . .

Jacob Frederick, Nicholas Nelson; Emily Reid; and Jillian Nethery / Faculty Sponsor: Dr. Kathryn West

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Here’s Why We Majored in English . . .

Meaghan Gallegos, Tiffany Lee-Ann Januszkiewicz; Trenton Mattingly; and Natalie White / Faculty Sponsor: Dr. Kathryn West

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Here’s Why We Majored in English . . .

Nicholas Nelson, Natalie White; Cathleen Jeanty; Rachel Kleinholter; and Rachel Glenn / Faculty Sponsor: Dr. Kathryn West

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